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June 1982
Volume 13 — Number 3
RECORDING • FILM • CONCERT & STAGE SOUND • VIDEO & BROADCAST PRODUCTION

AMEK

the credibility of success

For additional information circle #1

True credibility is only won by the continuing acclaim of knowledgeable clientele. Long-lasting success is only achieved by demonstrating ability to perform to the highest recognizable standards–which in our business and yours is the reproduction of music, first and foremost. AMEK specialises in producing consoles, and our customers worldwide are in all areas of sound – multitrack recording, film and video dubbing, broadcasting, and concert sound reinforcement. Our electronics are so transparent you may never know they are there. If you are seeking that elusive quality of performance in a console which so many strive for and yet so very few achieve, then allow us to show you the difference. We don't make wild claims–the proof will be in your cars.

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The EFFECTRON features the finest and most natural sounding digital delay effects available today at unheard of prices. Visit your local dealer and check it out.

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RECORDING
ENGINEER/PRODUCER

— the magazine to exclusively serve the **RECORDING STUDIO** and **CONCERT SOUND** industries . . . those whose work involves the **engineering** and **production** of commercially marketable product for
— **Records** and **Tape**
— **Film**
— **Live Performance**
— **Video** and **Broadcast**

— the magazine produced to relate recording **ART** . . . to recording **SCIENCE** . . . to recording **EQUIPMENT.**

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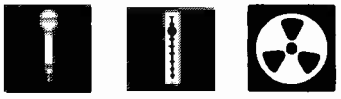

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June 1982
Volume 13 — Number 3

— Contents —

— **The Cover** —
Recording Technology in Motion, another original illustration by artist Trici Venola, highlighting the essential dynamics of today's creative recording process.

"EDDIE, I LOVE THE SOUND OF THIS BOARD."

Roberta Flack

High praise indeed from a performer of Roberta Flack's stature. But not unexpected by veteran producer and studio owner, Eddie Germano. Ed Germano got to know the JH-600 console series when he bought one for his Hit Factory Studios in New York City. And he was impressed, so impressed that he has already taken delivery of another of MCI's latest, most popular line of consoles

Professionals like Eddie Germano and Roberta Flack demand the best. That's why they demand MCI.

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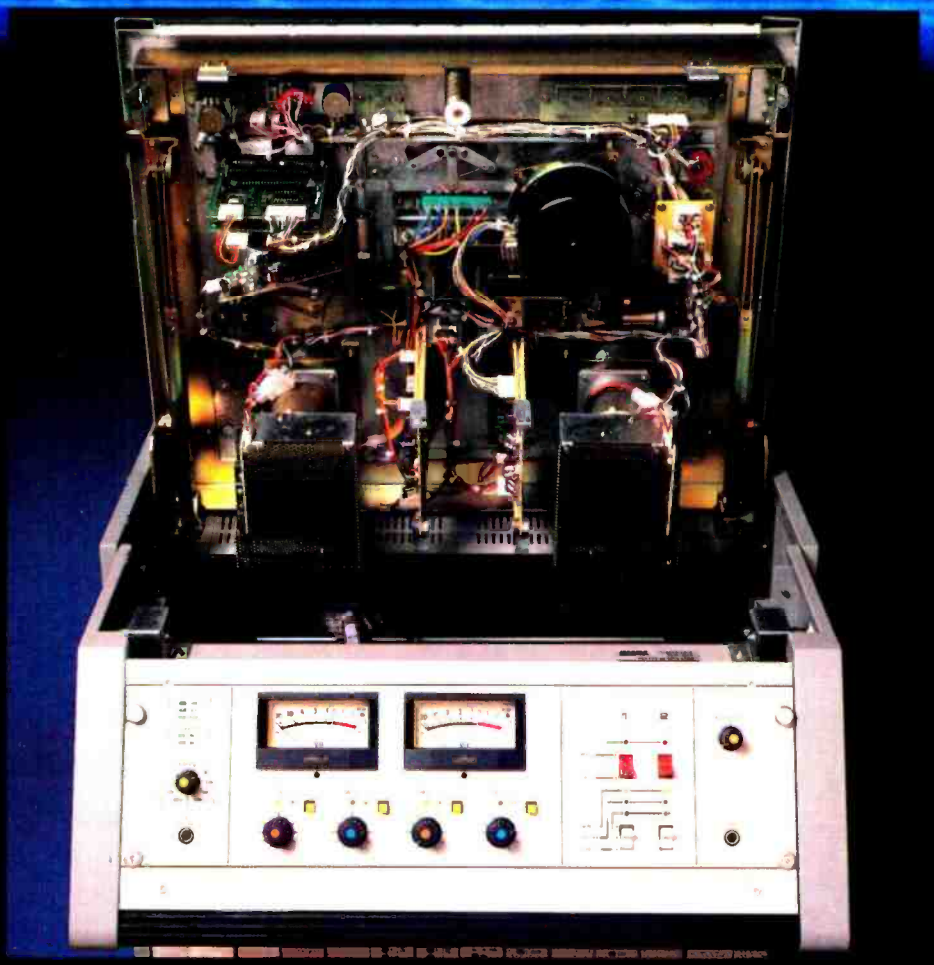
The Performance the Engineer/Producer Expects,

The Features and Reliability They Demand.

THE NEW OTARI MTR-10 SERIES MASTERING/PRODUCTION RECORDERS

We engineered them to be the ultimate in recording/mastering. They embody the innovative technology and the highest reliability that has made us The New Workhorse in audio production.

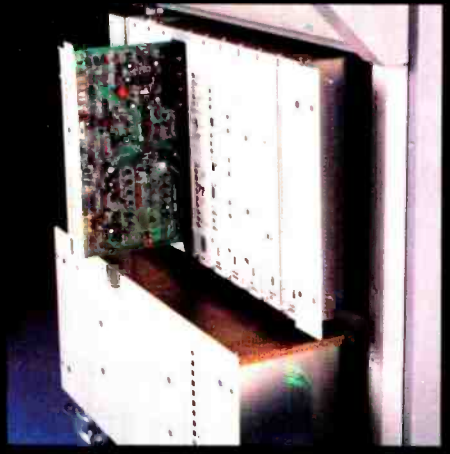


THE ULTIMATE IN PRODUCTION EFFICIENCY

- Three speeds: 3¾, 7½, 15 or 7½, 15, 30 ips.
- Full, two and four track formats.
- Flexibility in cabinet choice: desk type, overbridge or rack mount for custom installation.
- Full servo, D.C. PLL transport governed by an on-board microprocessor—an industry first.
- ±20% vari-speed with ips or percentage display.
- Built-in, no overshoot return-to-zero with optional 10 memory/one stroke and keyboard access autolocator.
- Internal multi-frequency square/sine wave generator.
- Preset master bias switching.
- Electronically balanced I/C with direct-coupled, high current outputs.
- Automatic reel size sensing with single hand, bi-directional tape rocking.
- Cue control with lifter defeat and controlled wind.
- Dump edit and shuttle edit control.
- Integral, precision splicing block.
- Cue speaker and headphone monitoring.
- Direct access playback head.
- Modular, single card electronics with high slew-rate integrated circuits.

THE ULTIMATE IN ANALOG AUDIO

- Dynamic Range: >75dB measured from noise floor to 3% THD (30 ips, #226 tape).
- Frequency Response: 0 VU (+4) 35Hz-29kHz, +1.0, −3.0dB @ 30 ips.



- Wow & Flutter: Less than 0.04%, DIN 45507
- Distortion: Less than 0.1% @ 1kHz, 250nWb/m.
- Maximum Output: +28 dBm.
- Adjustable record phase compensation.

These features and more will allow you to do your job faster while delivering every last dB of performance. It's the productive and efficient solution to the demanding new realities of the contemporary recording studio.

ENGINEERED TO BE EASILY SERVICED

Access to all components makes maintenance straightforward. The audio, transport, master CPU and power supply electronics are all of modular, card frame design; the entire transport assembly is top-hinged to allow wide-open access while the deck is in operation.

ENGINEERED TO THE HIGHEST STANDARD OF RELIABILITY

Reliability is paramount in Otari's approach to doing business. We've earned an enviable reputation for quality and value that has made us a leader in multichannel recording (MTR-90) and compact mastering recorders (the 5050 Series). With the new MTR-10, we have successfully bridged the gap between the new technology and reliability.

Evaluate the MTR-10 recorder for yourself by contacting your authorized MTR-10 Series professional audio dealer. It will become evident that Otari is several steps ahead of the competition—again. Audition the performance, features and engineered reliability that will meet the needs of engineers and producers for years to come.

The New Workhorse

OTARI

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BROADCAST PRECISION

Introducing the Ampex ATR-800. More features than ever before in a broadcast audio recorder.

In a busy broadcast environment, every minute counts. That's why Ampex designed the ATR-800 with saving time in mind. With more standard features than any other recorder in its class, the ATR-800 is the perfect choice for broadcast professionals. And recording studio engineers? Take note.

The ATR-800 was designed for tape editing. The wide open head assembly gives you fast, accurate tape access. Recessed head gate and transport controls prevent tape snag. And a continuously variable shuttle, under control of the microprocessor, regulates tape speed and direction.

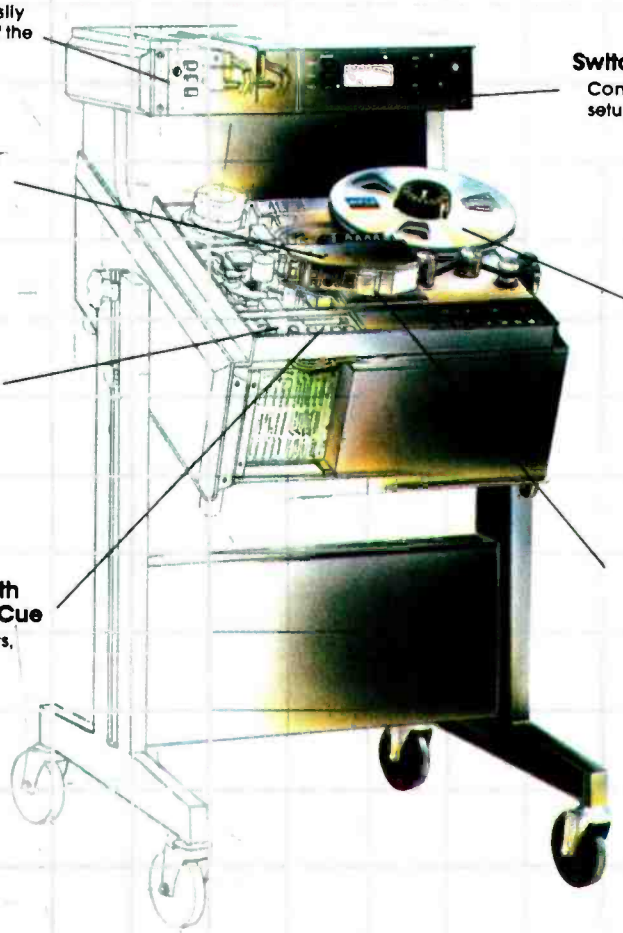
But the features don't stop there. You'll find a standard cue amplifier that allows monitoring of any or all channels, a quick change head assembly, a digital tape timer with single-point search-to-cue, three tape speeds with built-in vari-speed, fader start for remote control from a console and much, much more. All standard. And with a switchable NAB/IEC setup, the ATR-800 is a true international recorder in every sense of the word.

Look around, no other audio recorder offers you more standard features than the ATR-800. Whether you need rack mount, console or pedestal versions, call your Ampex dealer or write Ampex Corporation, Audio-Video Systems Division, 401 Broadway, Redwood City, CA 94063 (415) 367-2011. Sales, spares and service worldwide.

AMPEX

TOOLS FOR TOMORROW

Ampex Corporation • One of The Signal Companies



Serviceability
Plug-in assemblies are easily accessible from the front of the recorder, even when rack mounted.

Quick Change Head Assembly
Converts from one to two to four channels, or back quickly with no mechanical re-alignment.

Three Speeds with Variable Speed Operation
Machines are shipped with three speeds, 7½, 15 and 30 in/sec. Field convertible to 3¾, 7½ and 15 in/sec.

Digital Tape Timer with Single-Point Search-To-Cue
For accurate timing in hours, minutes and seconds.

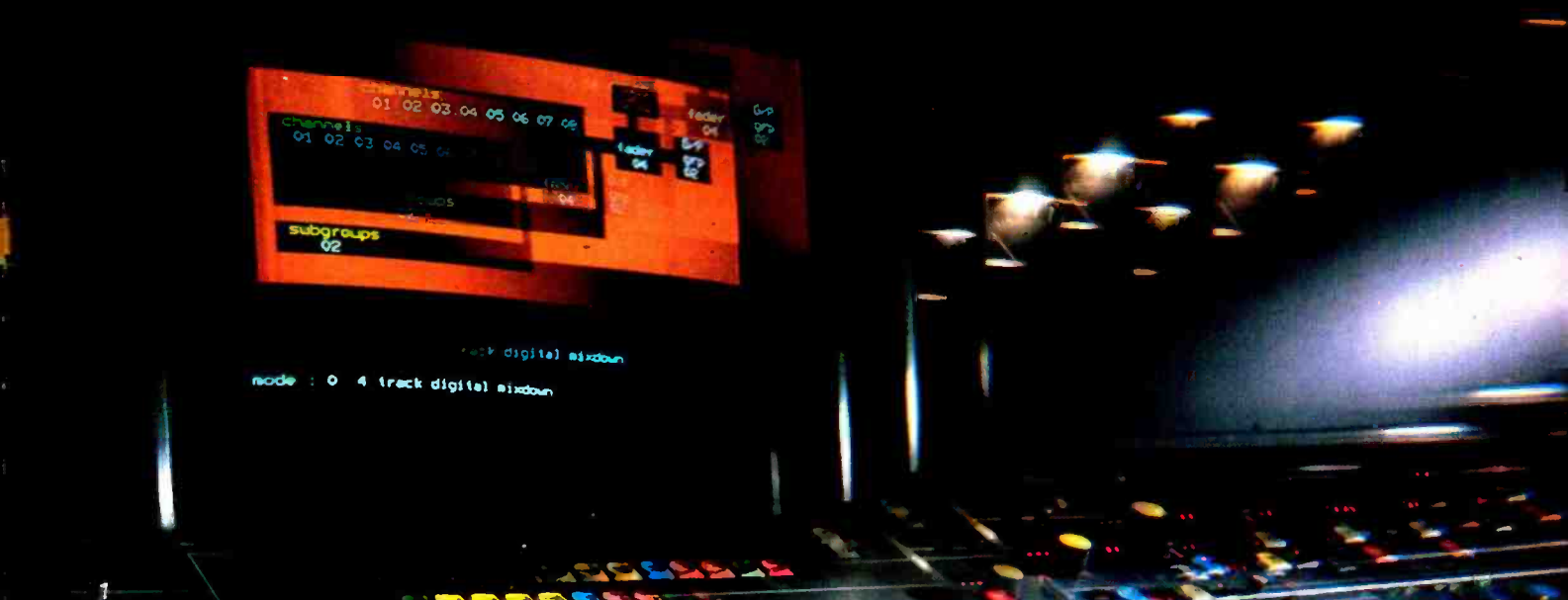
Switchable NAB/IEC Setup
Converts between NAB and IEC setup, including bias as well as equalization.

Microprocessor Control
Microprocessor system ensures safe, gentle and foolproof tape handling.

Designed For Editing
Head assembly is wide open for unequaled accessibility. Dump edit and hands-on-reel editing modes included.

For additional information circle #5

DIGITAL OR ANALOG? IT'S YOUR CHOICE



The First All Digital Audio Console

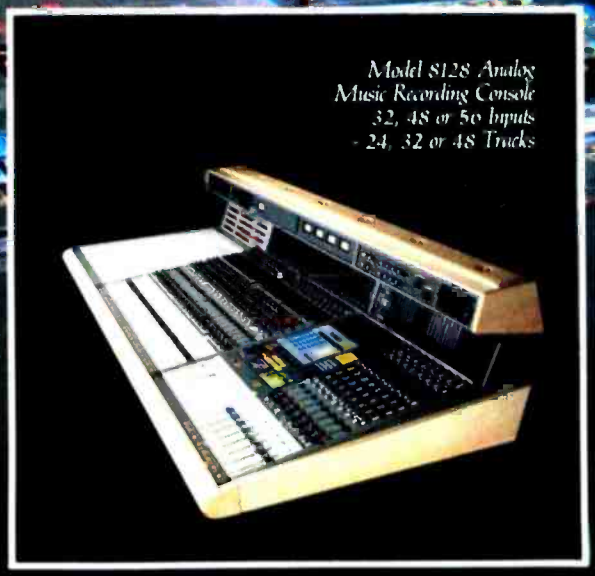
The Digital Audio Console is here. Only the Neve Group has the financial resources, the advanced technology and the commitment to the industry to be first with digital audio console technology. After more than two years of research and development, Neve has already delivered a complete digital audio console system to a major user for evaluation, with a first production system now being assembled for 1982 delivery.

DSP/CCR - Digital Signal Processing/Complete Control Reset

All program path processes are handled in the digital PCM form, including filtering, equalizing, limiting, compressing, fading, mixing and assignments. Inputs and outputs are in multi-standard 16 bit formats, with greatly enhanced internal dynamic range and processing speed by applying up to 28 bit formats within the system. All program path controls may be memorized, with instantaneous setreset giving precise repeatability. The time code synchronized computer control provides the ultimate in post production and mix-down facilities. Simply stated: everything is automated.

Superior Analog Consoles with Guaranteed Trade-In

Digital audio is certain to become the primary recording and processing medium. Neve recognizes that only the very top studios can justify the purchase of a Neve DSP/CCR system today. Therefore, for those quality conscious studios wishing to remain analog for the time being, Neve is introducing a Guaranteed Trade-In Plan applicable to 1982 customers of the Neve Advanced Analog Range of Model 8128 Music Recording and Mixing Consoles. This plan allows you to purchase a superior Neve analog console now, and not have to worry about its market value when the time comes to go digital. That's digital insurance!



Model 8128 Analog Music Recording Console 32, 48 or 56 Inputs - 24, 32 or 48 Tracks

If you need to buy analog, buy Neve. And get Digital Insurance!

Neve

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THE "TUCHEL" CONNECTOR

from: **Stephen F. Temmer, President Gotham Audio Corporation**

We have noted with interest the item on page 110 of the February issue of *R-e/p*, concerning "The Tuchel Connector" [written] by Larry Lamoray of MCI, a Division of Sony Corporation of America.

We would only like to correct an impression which this very excellent contribution leaves in the reader's mind: namely that the Tuchel subsidiary of Amphenol has some sort of monopoly on such a 30-pole connector.

It is a fact that, as the article correctly identifies, it is a connector described in the German DIN 41 622 Standard, and as such is available from a number of manufacturers in Germany, including Siemens, from whom we obtain them. While all the connectors from all of the suppliers will properly mate [with one another], they each utilize their own proprietary contact system, and thereby differentiate themselves. One other very important matter of competition between these suppliers is the size, shape, locking arrangement and materials from which the housings are made. There are important differences to be found there.

Gotham Audio supplies a 10-pair, highly flexible, individually shielded cable made especially to properly fit the cable entry on such housings.

FINANCIAL SURVEY OF TELEVISION INDUSTRY SHOWS HEALTHY GROWTH

The annual financial survey conducted by the National Association of Broadcasters of the nation's television stations shows that in 1981 the typical station had a pre-tax profit of $1,064,000 — a 12.6% increase over the previous year. The survey was based on replies from 436 stations, and showed an increase in all catagories.

Gross time sales increased 15.7% to $5,739,100, and net revenues were up 16.7% to $5,066,300. For the first time since 1970, the typical station received more advertising dollars from national and regional spots than from local advertising. Also, non-broadcast revenue hit $117,200 (15.70%), and $129,100 (33.09%) for trade-outs and barter transactions.

In contrast to a 22.75% increase in programming costs to $1,484,500, technical costs rose by 14.6% to $442,200.

The survey also shows that the typical station has 78 fulltime employees — up from 71 in 1980.

CALIFORNIA SALES TAX ISSUE; CEO Reports That Money and Industry Support Necessary

The California Entertainment Organization (CEO), formed less than five months ago, reports that it has made a certain amount of progress in formulating industry-wide solutions to the potential sales tax threat from the California State Board of Equalization (see February and April issues of *R-e/p*). It warns, however, that the current situation is dire, and support — especially financial contributions — is needed to avoid losing all the hard-won efforts achieved so far.

In April, CEO was able to have legislative amendment introduced in the California Assembly (known in the legislature as "AB 2871") through the sponsorship of Assemblywoman Gwen Moore. The effect of that amendment would be to correct the manner in which the taxing authority, the State Board of Equalization, is interpreting the state sales tax law; and, if successful, AB 2871 should correct that interpretation back to 1976.

The introduction of CEO's proposed law with the legislature is only the beginning of the legislative process, it says. The proposal must pass through a rigorous series of committee votes, Senate and Assembly floor discussions, and then receive the Governor's signature before it becomes law. AB 2871 is not expected to go into effect before November, 1982. To help in the fight, CEO has hired a team of lawyers and made a number of important governmental contacts. But CEO still considers that solutions to the problems are a long way off.

"CEO has brought the ball up to the 10-yard line, but we need much more to make the goal," stated CEO board president, David Rubinson. "We need financial support from the record labels, hard dollars to pay for the lawyers acting on our behalf. We need membership numbers to demonstrate our strength and our unity. We need to be collecting and disseminating information — if you have been 'hit,' if your friends or lawyers or accountants tell you not to worry, if you know anyone who has been successful with the State Board of Equalization, get in touch with us."

Even as the CEO continues to press for solutions to current and retroactive assessments of 6% sales tax against independent record producers, recording engineers, record production companies and recording studios, the bounty for the state is increasing. The 6% sales tax is being *raised* to 6.5% in Los Angeles County, effective immediately, the CEO has learned. It was also learned that the 12% per year interest rate on unpaid taxes is being raised to 18% per year, computed on a daily rate. The rate increases are part of the plan to balance the ailing state budget, according to Richard Nevins, State Board of Equalization (SBE) member.

While the law is awaiting passage, assessments and SBE hearings continue. Recording studios and engineers report that the taxing agency is acting without any clear understanding of how a master recording is made. "Oddly enough, the SBE staffers don't seem much better informed about their own regulations and practices than they do about how the record business works," stated Jane Wolf Eldridge, executive director for CEO.

R-e/p has discovered that even those individuals who have acquired seller's permits, the pre-requisite for collecting the 6% sales tax (now 6.5% in Los Angeles County), are not having an easy time collecting that amount. Many record labels will not pay the extra cost, and only those who can command it are actually getting reimbursed from the "manufacturers," the record companies.

One way that some people in the industry are solving the problem is to make their albums, even build their studios, outside this state. CEO has learned that there has been an increase in record production in Florida, Arizona, and Colorado, and that these producers are attributing such moves to the imposition of sales tax in California. CEO is also exploring the possibility of some tax incentives for the industry in Nevada, where there is also no state income tax.

"The more we look into this, the more we find," Eldridge concluded. "If AB 2871 does not pass into law, this industry, and every other creative industry from video to animation to computers, is in big trouble. This concerns *everyone* in the record industry. The biggest problem CEO has is that no one really believes it will happen to them."

CEO can be contacted at **P.O. Box 512, Van Nuys, CA 91408. Telephone: (213) 906-2080.**

OTARI ANNOUNCES NEW RESEARCH & DEVELOPMENT DIVISION

The new Research and Development division for Otari Corporation will be headed up by Steve Krampf, appointed general manager. Tom Sharples has been appointed engineering manager. A new research facility featuring the latest in test equipment and listening environments is being constructed adjacent to Otari's U.S. Headquarters in Belmont, California.

"The purpose of the new division," Krampf said, "is to diversify and expand

. . . continued on page 106 —

New England Digital's Synclavier® II

Two years ago, when the Synclavier® II was first introduced, we announced the end of synthesizers as you once knew them. One year ago, with the addition of the Terminal Support Option for the Synclavier® II, our synthesizer continued as the world's most advanced and best selling digital system. This year, with the release of two new options, Sample-to-Disk™ and Music Printing, New England Digital continues to pioneer the computer music revolution with products destined permanently to change the world of music. . .

One Compact System . . . Virtually Unlimited Features

The Synclavier® II has earned its reputation as the number one digital system worldwide because New England Digital delivers features, not excuses. In order to accomplish this, the basic Synclavier® II is designed around one of the most powerful and upgradeable 16-bit minicomputers in the industry. Complementing the computer is a flexible and efficient high-level structured software language, XPL. This powerful, unbeatable combination provided the vehicle for the rapid addition of new features to the Synclavier® II. Best of all, these new features were simply mailed to our customers on a floppy diskette.

To insure that these features produced outstanding musical results, New England Digital designed the simplest, most intelligent musical interfaces available, which provided the synthesis of sounds never before possible from any system. Sounds so realistic that after hearing the Synclavier® II demo record, people called to say they could not believe one instrument could produce sounds so lifelike. This same method of control can be mastered by anyone. By simply pressing a button and turning the master control knob, the user can adjust the parameters of the Synclavier® II instantly. For example, you can have up to 32 separately controlled channels or "voices" which consist of (1) 24 harmonics, (2) six-stage volume envelope generator, (3) six-stage harmonic envelope generator, (4) digital FM control, (5) extensive vibrato control, (6) portamento control that can be logarithmic or linear, and (7) decay adjust, permitting longer decays on lower notes. You can quickly recall from 64 to 256 preset sounds available on the Synclavier® II at any one time. Also, the possibility for creating your own sounds from scratch is limited only by your own skill and imagination. To add more realism to timbres, the Synclavier® II gives you extraordinary capability to change sounds as you play them, accurately recreating many of the subtle changes real instruments make during a live performance. To top it off, the Synclavier® II comes with a 16-track digital memory recorder which is more sophisticated than any other system recorder or sequencer on the market today. The enormous power of the Synclavier® II's hardware and software allows the user to record and mix complete multi-track recordings within the Synclavier® II, set independent loop points for each of its 16 tracks, transpose and bounce tracks, and edit or change the scale of a prerecorded piece of music from the key of C to B minor. The compositional aspects are staggering.

Terminal Support Option . . .
The Musician's New Instrument

In addition, New England Digital integrated a high-resolution graphics computer terminal for use in conjunction with the Synclavier® II's keyboard (at left). This *Terminal Support Option* has opened up new horizons previously unavailable from any system. This option provides a *Graphics Package* which allows the user access to a detailed graphic or numerical display of the timbre being programmed. A sophisticated music language titled *SCRIPT* permits the user to take a performance played on the keyboard or typed in on the terminal and edit or synchronize it to a film or video production. Plus, precise polyrhythmic melodies can be developed which would be difficult or even impossible to play on a keyboard.

For those interested, a more complex language, *MAX*,™ a superset of XPL, allows the user to write his own software programs to control New England Digital's special purpose hardware.

Even with these extensive features, New England Digital has only just begun to utilize the capability of the Synclavier® II. We invite you to turn the page and examine another product of the future, available today from New England Digital.

new england digital

For additional information circle #7

views

—AUDIO/VIDEO—

RECORDING

VISUAL MUSIC — AN ADDITIONAL SOURCE OF INCOME FOR THE AUDIO INDUSTRY?

by Martin Polon

1982 has become the year of the non-product. Several much publicized new audio/video services have taken a step backwards, or stalled in development or marketing. Of the three videodisk systems in the marketplace, one has not met its sales commitments (RCA); one has had to close its domestic pressing plant (LaserDisc): and one has postponed introduction until the end of the year (VHD). The Digital Audio Disk has been demonstrated, and 38 manufacturers have committed to the system; its introduction, however, has been delayed towards 1983. By contrast, visual music has proved itself not to be one of these non-products; instead it has been clearly established as a program commodity for home entertainment.

Aside from the large number of promotional video music releases that have appeared for New Wave and other popular music groups, the Warner-Amex dedicated music channel is operating on hundreds of cable televison systems all over the United States. Known as Music TV (MTV), this 24-hour-per-day satellite fed service reaches nearly four million cable TV subscribers on nearly 400 cable systems, stereo sound being provided as a dedicated FM signal to be reproduced on the viewer's home stereo system. Program material consists of the various record promotions, and dedicated productions of visual music.

MTV has even spawned competition, with the Video Music Channel providing similar services to approximately 800,000 cable subscribers. There is even a Nashville Network in development, based on the Grand Ole Opry, to provide cable subscribers with visual music in the country genre. Other large cable programmers, such as Home Box Office (division of Time, Inc) and Rockefeller Center (partnered with RCA), are rumored to be planning similar services to the above mentioned cable music-video channels.

Similarly, the advent of stereophonic videocassette recorders with Dolby stereo capabilities has prompted the release of stereo cassettes with visual music programming. Even though Akai, Panasonic and JVC have just begun marketing stereo VCR's this year, two stereo videocassettes have already made the *Billboard* Videocassette Top 40 charts. These two, Michael Nesmith's *Elephant Parts*, and Olivia Newton John's *Physical*, join other successful video music releases such as Blondie's *Eat With The Beat*. (The Blondie release is reported to be the most successful video-music release to date, with sales in excess of 10,000 copies.)

Video disco clubs, springing up first in New York and Los Angeles, have spread to other cities around the world. Major groups, including Earth Wind and Fire, are preparing new video music releases. Ultimately, the videodisk will be accepted by the consumer, and the release of all kinds of musical performances, both in concert and in the studio — as well as with the whimsical visuals that constitute video music — will become common place. Since all of the present disk systems offer stereo reproduction with noise reduction (CX, dbx, Dolby, etc.), the potential of releases such as Pioneer Video's *Tanaka* will be many times what the market can absorb today.

So, it seems that visual music is healthy, but does it provide a marketplace for the audio production studio with video capability? The answer is: Yes and No. At this point, the major stumbling block to studios becoming involved with visual music is the high cost of video production; in most cases only the major record companies have the resources to finance production. The cost of a visual music presentation has worked out to around $25,000 per song, which compares with television production costs in the range of $8,000 to $20,000 per minute, and theatrical motion picture production costs in the range of $50,000 to $125,000 per minute. The net result is that current video music, utilizing theatrical facilities used for large-scale television and film production, has become very costly. This is especially a problem for the record companies, in view of the current deflated marketplace for records.

The opportunity is there for smaller scale visual music production if the facilities are capable of meeting the expectations of the audience. The production of video music requires a certain blending of visual and stereophonic elements. Aside from the ability to mix-down multitrack in SMPTE timecode lock-up with one-inch C-format or ¾-inch professional video tape recorders, full video editing facilities are also required. The kind of visuals that have become a part of the mosaic of video music would normally be shot outside of an audio production facility — either on location, or in a studio with elaborate sets. The use of ¾-inch video for production in the ENG (Electronic News Gathering) style is possible with time-base correction, and can reduce production costs, especially where the end product is to be viewed on cable without further distribution. In this way, the audio production house can even participate in the creation of the visuals. If the soundtrack was recorded at the same audio house, the total participation from start to finish enhances the entire project.

Various production schemes for video

Synclavier® II's Sample-To-Disk™ Option

The Most Important Technological Advance for Commercial Synthesis Since the Synthesizer Itself.

Using the Synclavier® II's new Sample-to-Disk™ Option, you can now digitally record **real instruments or whole sections of instruments** into the Synclavier® II using a microphone or any line-level source, and then perform them on the Synclavier® II's keyboard. But, that's only the beginning. Using sophisticated software techniques which are simple to operate, you can then analyze the recorded instrument(s), and, if you wish, completely reconstruct and alter the sound before performing it on the Synclavier® II's keyboard.

The Synclavier® II's Sample-to-Disk™ Option is *the* superior approach to music sampling. Its audio fidelity and length of sample time far surpass anything on the market today.

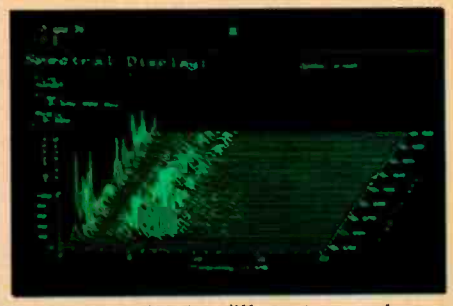
The Sample-to-Disk™ Option can be added to any Synclavier® II music system. Analog signals can be recorded at a sample rate up to 50KHz, onto a Winchester Disk (shown below). You may select a wide range of sampling times from a minimum of **100 seconds** to a maximum of **54 minutes,** depending on the size and number of disks your Synclavier® II has. Also, to insure precise conversion of the recorded signal, 16-bit state-of-the-art, digital-to-analog and analog-to-digital converters are included.

Leading Edge Technology Made Useful to the Musician

The technological wizardry of New England Digital now makes available a powerful performance and research instrument to help you understand and use creatively one of *the* most important components of music . . . *sound.* Though extremely advanced, this system is simple to learn and easy to operate. For example, to begin sampling any sound, all you do is type a simple command on Synclavier® II's terminal. While you are recording, the terminal draws a real-time *Envelope Display* allowing you to see how many seconds of sound you are recording. By typing another command, the display on the terminal changes to a *Signal Display,* which plots the recorded waveform of a violin, sax, human voice or whatever you have recorded in the time domain. It graphs the amplitude of the signal as it changed over time. At this point, using the cursor on the display, you can label the beginning and ending points of the signal, enabling you to play just that small segment of the recording, again and again, on the Synclavier® II's keyboard or extract that segment for a more detailed analysis.

If you are interested in the harmonic content of a sampled timbre, typing another command draws a three dimensional *Spectral Display* on the terminal. This display automatically plots the strengths of individual harmonics present in the timbre, and displays how they differ over time. You can also examine non-harmonic sounds such as a cymbal crash (below). This is an extremely useful feature in learning the timbral characteristics of any musical instrument and will act as a guide to synthesizing future timbres.

To modify or reconstruct a sound, two necessary software techniques are supplied. The first is *Digital Filtering* which permits you to reduce noise or individually filter out certain harmonics present in the sound, thereby changing the timbral characteristics of the sound.



The second technique, *Editing,* allows the user to examine two completely different waveforms graphically, on the terminal, and extract segments from each waveform to be spliced together for a totally *new* sound or sound effects. To illustrate, you could attach the attack of a snare drum to the sustain of a vibraphone.

Real Time Performance

Once satisfied with your timbre, you can transfer it to the Synclavier® II's keyboard for real time performance. Complete control over the decay and sustain of the timbre is possible, plus musical effects such as pitch bend are available.

These features, advanced as they are, are only the beginning. However, one thing is certain, the Synclavier® II's Sample-to-Disk™ Option is destined to change the world of music synthesis forever.

n.e.d.
new england digital

music are possible for an audio production studio configured for video sweetening; i.e. possessing some kind of video recording/playback/editing facilities, as well as large-screen display of the visual material. If the studio is equipped with one-inch C-Format machines, then the process of post-producing video music is easily accomplished. One-inch professional video machines configured for stereo, with Dolby noise reduction, carry the necessary SMPTE timecode and control information on allocated cue and control tracks. Associated editing equipment for the post-production allows merging the audio into the video to create visual music. One drawback faced by an audio facility interested in getting into this business is the relatively high cost of one-inch video tape recorders and associated editing equipment. With such VTR's costing upwards of $100,000 each, and editing gear costing at least $40,000, it requires a cool quarter of a million dollars to be fully equipped for professional-level video sweetening or video music business.

A less expensive production alternative is to use the ¾-inch video format. This concept of editing and sweetening with a ¼-inch video "workprint," has become almost a standard since it was pioneered by CBS and others for the production of network television programs. The audio sweetening of video has adopted the workprint system to a large extent, and the possession of ¾-inch videocassette recorders with a PCM audio record/playback adaptor would allow mixdown to a high-quality two-track format. The latter could then be edited to the visual materials and dubbed up to one-inch helical scan for distribution, with very little degradation of quality.

Another method would be to use ¼-inch machines as video "Moviolas," editing on a copy of the original video recording while maintaining timecode synchronization with a multitrack or digital audio tape recorder. Conventionally, the ¾-inch videocassette recorders put the SMPTE timecode on one of the audio tracks, as does the one-inch machines (using a cue track). However, the use of the video vertical interval signal area for storing timecode is picking up both acceptance and available hardware, allowing more flexible utilization of the audio/video recording relationship via SMPTE timecode. A complete ¾-inch video system with comprehensive editing facilities, a third machine for digital audio (with corollary PCM equipment) and a projection television system can be acquired for under $60,000. So for just under a quarter of the cost of one-inch video equipment, an audio house can place itself into the world of visual music and video sweetening.

The question that comes to mind, however, is where does the performing artist fit into all of this? The answer is that the artist would welcome the same kind of creative relationship that occurs between the artist and the recording studio in making the audio record. At this point, because of the high costs of conventional video production houses, most of the creative control for video music remains in the hands of the record label for which the artist records. The availability of more flexible and less expensive venues for the creation of video music can only increase the total amount of software available in the genre. Since a single cable channel playing for 24 hours per day utilizes almost 9,000 hours of programming per year, the need for video music software seems assured. ■■■

STUDIO DESIGN AND CONSTRUCTION

Live-End/Dead-End Acoustics — Practical Experience at Normandy Sound Studios

by Paul D. Lehrman

"The most important piece of equipment in a recording studio is the control room," says Phil Greene, chief engineer and part-owner of Normandy Sound, located in Warren, Rhode Island. It's that kind of thinking that led Normandy, one of the first 24-track studios in the region, to become the first facility in the six states to feature a certified Live-End/Dead-End control room.

Since the new room opened last October, business has been good, but that's not necessarily due to the new control room. One of the more important clients has been Billy Cobham, who came to this mill town from his home in Switzerland, on a blind recommendation from his bassist Tim Landers, to record two albums that were quickly picked up by Elektra/Musician. *R-e/p* spoke with Normandy's chief engineer Phil Greene on two occasions: the first was in January, while tracks for the Cobham session were being laid; and the second was in March, right after Cobham's tour with Bobby and the Midnites, during the grueling 12-day mixing session.

Greene wastes no time explaining what the LEDE concept means to him. "It's as close as you can get in reality to an anechoic chamber at the front of the room," he says. "Obviously you have the window and the console, but there is an essentially uncolored signal path between the speakers and the ears, with no phase or frequency-response abnormalities — you hear the speakers, *not*

— continued on page 20 . . .

Synclavier® II's Music Printing Option

You Create! Let Synclavier® II Do the Work.

New England Digital's computer music revolution continues with Synclavier® II's sophisticated automatic Music Printing Option. With this option, you can play any combination of notes on Synclavier® II's keyboard and then easily transfer those notes to Synclavier® II's terminal for editing. Once you have finished editing, a simple touch of a key on Synclavier® II's terminal gives you a high quality, hard copy printout.

This amazing new development eliminates the drudgery of translating your musical ideas to paper. Now you can concentrate on your creativity and let Synclavier® II take care of the paperwork. Again, like all of New England Digital's products, it could not be easier to operate.

After playing a piece of music on Synclavier® II and storing it in its 16-track digital recorder, you may select which track or tracks you wish to print. To insure rhythmic resolution while playing, the system is adjustable to capture notes from 64th notes to any greater value.

Following a simple software menu provided by New England Digital, you can quickly edit the notes, change clefs, key signatures and keys of the instruments, and even change the resolution of the original rhythm.

Synclavier® II's Music Printing Option may be added to any Synclavier® II. It can be used to print out lead sheets (complete with lyrics), piano music (shown below), orchestral scores, and individual parts.

The Sample-to-Disk Option and the Music Printing Option are, again, examples of New England Digital's extraordinary ability to provide new enhancements and exciting options for the Synclavier® II system.

When you purchase a Synclavier® II, you'll never be stuck with today's technology tomorrow. Synclavier® II offers the ability to be upgraded and expanded year after year and to remain state-of-the-art indefinitely.

Synclavier® II digital music systems start at $13,750.00.

Don't forget to inquire about our line of business software for your studio and personal use.

Synclavier® II's Instruction Manual

Available now. Complete and descriptive text, with diagrams, explaining, step by step, how to operate the Synclavier® II real time system and terminal support option. You owe it to yourself to keep pace with the future of music. Send $50.00 (USA & Canada) or $60.00 (elsewhere) to receive your postpaid copy.

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For more information, a personal demonstration, or the name of your nearest representative, please call or write:

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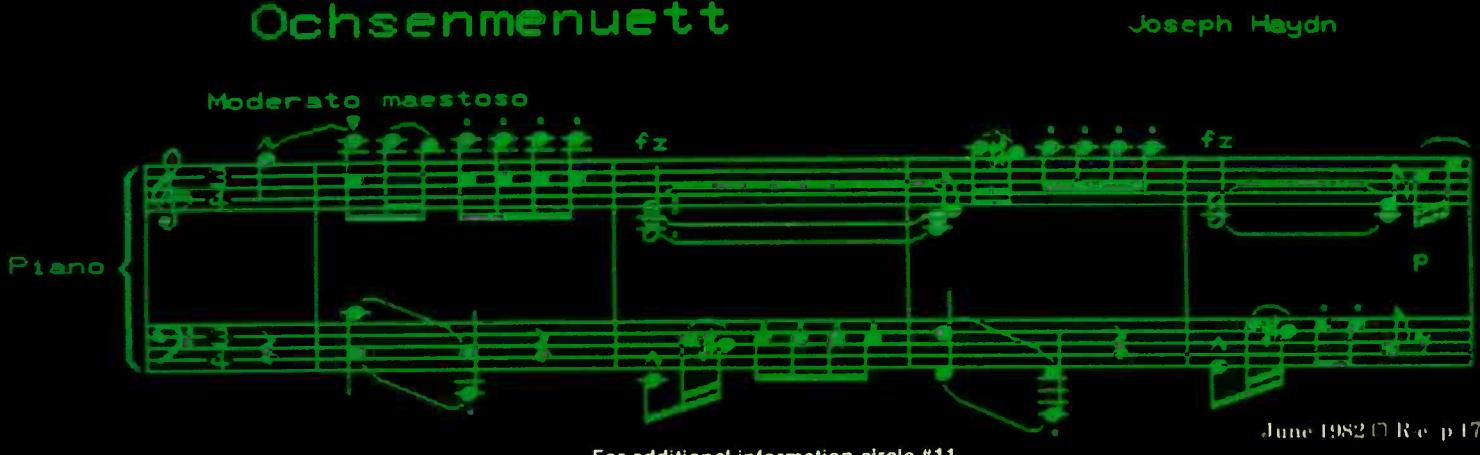

For additional information circle #11

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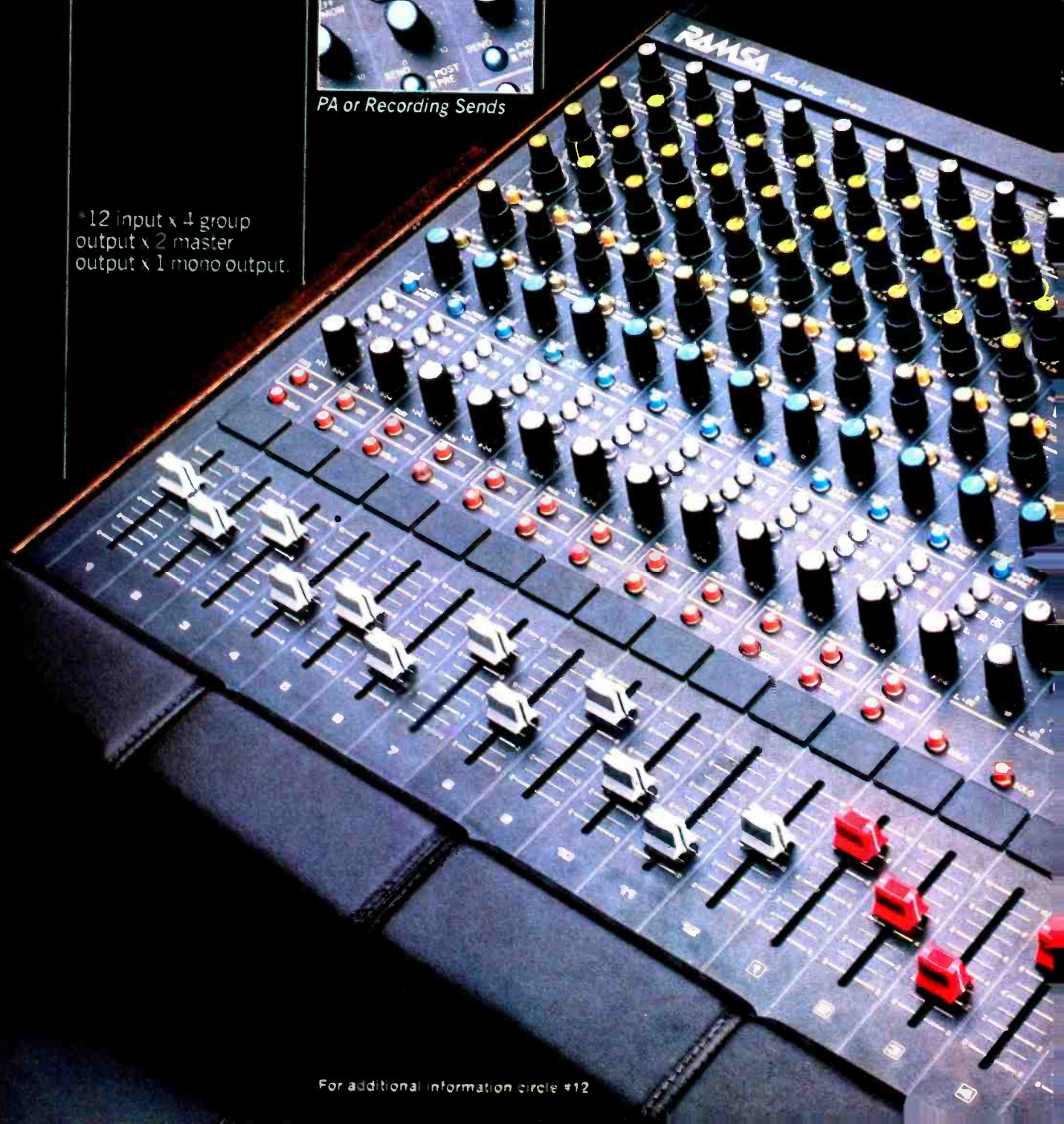
The Ramsa WR-8112 gives you the flexibility of switchable turnover

PA or Recording Sends

*12 input x 4 group output x 2 master output x 1 mono output.



RAMSA

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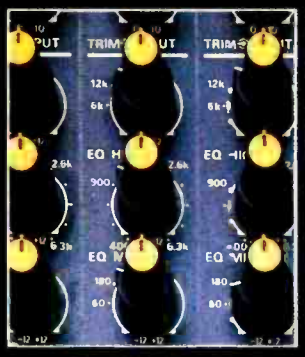

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For more information, call (201) 348-7470.

Panasonic
PROFESSIONAL AUDIO DIVISION

... continued from page 16 —

the walls.

"Of course, if the whole room were an anechoic chamber, you'd go crazy, so the rear wall is diffuse reflective, more or less centered towards the mixing position. Not only does it recreate some ambience, so that you don't put huge amounts of reverb on the tape, it also improves the sense of where sounds are coming from in the stereo field."

Arguments can be (and are) made that such a "clinical" environment bears no relation to the outside world, and that this concept is just another room that a producer has to get used to before his or her product will translate well to the street. But Greene still feels it is useful. "Of course it's unrealistic; *every* listening environment is. But what this concept does is eliminate one generation of listening error, which is the almost random effect that a room usually has."

The Conversion Process

Normandy's old room was well-respected for its accuracy, and it wasn't an easy decision to rip it out and start over again.

"I wasn't unhappy with the old room, to be totally honest," Greene admits. "It was 'splashy,' so I tended to mix things dry. Sterling Sound, who does most of our disk mastering, commented at one point that our product was a little dry. The room also had a hyper-preciseness that was unnatural. It would tend to dry up the bottom, so that those tracks were always too separate — it was hard to get them to blend. We thought we should be able to do a better job monitoring. If you're secure in knowing that what you're hearing is what's *really* there, then you can make a good record, no matter what your equipment is like. We've stressed that attitude ever since we first opened as an 8-track. We were comfortable with the old room, so going with LEDE wasn't a necessity for us, but it was a good choice.

"When I was looking around for a design, everybody sent me to Don Davis. I had agreed with the theory for years — it's pretty hard to shoot holes in — but it seemed that it might be so far ahead of the real world that it might turn out to be too exotic. We talked to the folks who designed the [New York] Record Plant, which is a great room, but they seemed to play a lot of it by ear, and I wanted a design I knew would work right the first time. It was a little discouraging when I went to a few rooms in the area that were uncertified attempts at LEDE, and they were *total* failures.

"What finally clinched it for me, however, was an interim step we took when we removed the ceiling from the old room, and just left the insulation and the cloth covering hanging there — sort of a Dead Top. I loved the mixes I found myself doing, and I realized this was the way to go."

Considering the amount of work that had to go into the new control room, it was done very fast — downtime was about a month. Dan Zellman of Howard Schwartz Studios, New York, an engineer certified in LEDE design and measurement, came up to the studio and did the blueprints in a few days. Then, the existing room was torn down to the outside walls, an asymmetrical outer shell was put in, and the symmetrical room was built inside of that. The carpentry was handled by two local builders, Alan Souza and Gary Fenster.

"Alan's an artistic type," offers Greene. "Most carpenters in a studio situation get blown out by the number of intersecting odd angles they have to

Live-End/Dead-End is a trademark of Synergetic Audio Concepts, San Juan Capistrano, California.

THE INSIDE STORY

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LIVE-END/DEAD-END ACOUSTICS

deal with. This guy loved what he was doing, especially when things weren't rectangular. The blueprints were very precise, so there wasn't much margin for error.

"We started out with soft fiberglass on the front walls, but it was a little *too* anechoic for our taste — it soaked up too much sound, and the whole room was a few dB short on level. We replaced it with harder stuff: a thin version of the material they use to insulate boilers."

The frame itself was heavily overbuilt, with double-studding and two layers of sheet rock. "It's got to be solid," Greene says. "If the walls move, it defeats the whole purpose."

Meanwhile, Bob Windsor, one of Normandy's engineers, was working on the new wiring harness (along with the control room, Normandy was putting in a new MCI JH-600 console and JH-24 multitrack). It took about 36 hours to install completely the harness and recording equipment after the room was finished. The final step was certification.

The Acid Test

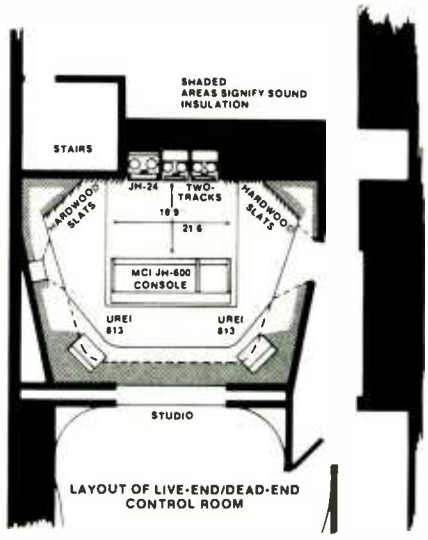
"I'm not sure certification is absolutely necessary," says Greene, "but if you're going to go to all that trouble to build it, you might as well go all the way."

Designer Dan Zellman spent a good day checking out the room, and gave it excellent marks. "He checks the sound coming from the speakers, the acoustical coupling with the room, the anechoic 'hole' following the initial blast, then the first reflection and the diffusion. Obviously you can't get rid of all of the uncontrolled sound, but the concept is valid as long as it's within certain specs, which are pretty stringent," says Greene.

In spite of the good evaluation, Greene noticed there were problems with the finished room. "It was a little short on the low-end. The kick drum wasn't reaching out well. On a hunch, I removed the drivers from the UREI 813A's we had put in, and replaced them with our old Altec 604-8G's. Even though they were out of time-sync, it cleared up the problem immediately.

"I was actually pretty upset. I had ordered 813's, which use essentially the same drivers as our old Altecs, but by the time we took delivery, UREI had stopped shipping them and sent us 813A's instead. The difference is that the new speakers use ceramic magnets. They're always talking about how great they are, but the real reason is that A1NiCo, which they used to use, got too expensive.

"But the ceramic magnets have poor low-end response, and they sound harsh and strident. The speakers measure out the same, but they sound *totally* different. I had to take the horns off the Altecs and put the little blue UREI horns on



LAYOUT OF LIVE-END/DEAD-END CONTROL ROOM

them, and I had to buy different crossovers, because the ceramic magnets are shorter, and therefore use a shorter delay. Now they sound great. They're about 2 dB less efficient, but I can deal with that.*"

As one might expect, Greene is very happy with his new room, and knows why. "It doesn't wear me out nearly as much — I can work for a long time now," he offers. "Since the speakers and the room are all phase coherent, I don't have to listen to phase distortion, which is very fatiguing. I'm also working 7 or 8 dB softer. I can hear things more clearly at lower levels, which also helps to make it sound better on the street.

"I realized that the other room tended to 'smear' the image, which had to do with reflections off the ceiling. It was

*Garry Margolis, Sales Director of UREI, comments as follows:

"We noted Mr. Green's comments on old versus new 813's with interest. There are a number of objective and subjective differences between the old and new coaxial drivers. The older A1NiCo magnet was subject to partial demagnetization when hit by very heavy transients reproduced by a large power amplifier. This demagnetization lowers the mid-range response of the driver, and, therefore, apparently increases the bass response. The newer ceramic magnet will not be demagnetized in heavy use, and will retain its sound character. The new drivers have a crisper, tighter low-end, which may seem light to someone accustomed to a demagnetized A1NiCo driver. The mid-range response of the new driver has been considerably smoothed, and dispersion broadened, when compared to the original system. The new horn design uses slots to minimize the shadowing of mid-band response from the cone, and utilizes a new diffraction buffer and padding in the horn to reduce reflections, improve dispersion, impedance matching, and smooth the out-of-band response. We are soliciting user opinions regarding further improvements to our monitors, and we appreciate Mr. Green's comments."

. . . *continued overleaf* -

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tough to hear small panpot adjustments. Also, now that I have the new speakers, the room sounds pretty much the same over a wide range of seating positions. Of course, you're limited by the on-axis response of the tweeters, but I think the room even compensates for that a little.

"I always tend to listen on headphones before I let anything out, and LEDE and cans aren't really too far away from each other. You can't really get a good idea of bass on phones, however, and there's no ambience. So this is the best of headphone-type listening, yet without the drawbacks."

The new room has changed some of Greene's work habits. "Things that sound really bad will drive you out of your mind," he concedes. "For example, piano miking that used to sound fine now sounds as if the piano is inside out. You become hyper-aware of phase anomalies. I find that I'm using a lot more coincident-mike placements, and paying a lot more attention to phase coherency. I'm also taking more care with mid-range EQ. I can hear the subtleties better; of course, that has a lot to do with the speakers as well as the room. I'm mixing wetter, and I'm using the wall monitors a little more than I used to. The room makes very little difference when you're near-field monitoring — the primary reflection there is still off the console itself — but I never liked small console speakers anyway. They're only really effective in the mid-range, and I have three different sets that sound *completely* different."

The new room has also necessitated changes in monitor amplification. Because of the reduced efficiency, the old Spectro Acoustics 125 watt per channel power amps were replaced with a McIntosh Model 2500. An intermediate setup used UREI power amps, but Greene found them short on headroom, and the damping factor to be too high for his speakers.

"The Altec-type woofers are made to move around, and the UREI held the cones too tightly," he says. "The Mac is transformer-coupled, and although it has a high damping factor for that type of amp, it's a lot lower than a direct-coupled amp. It's much nicer to listen to."

Reaction from Clients

Of course, the most important thing in any studio improvement is how it affects business, which is largely determined by artists' and producers' reaction to the change.

"Billy Cobham's not the kind of guy who gets impressed with engineering concepts like LEDE, but if he takes the tape home and likes the way it sounds, that's cool," says Greene. "If he doesn't like it, it's not cool. All the rest of the hype doesn't matter to him. But most of our clients are long-term, and they're saying that our mixes are much better. The new clients all like it too, even though they don't have our old room to compare it to. But they do compare it, very favorably, to other rooms they've been in.

"The LEDE concept is so new that even a lot of people in the engineering end of the business aren't that aware of it, so you can't expect the creative people to concern themselves with it for some time yet. I think though, that artists and producers will care more in the future, and it will become a major issue."

And at the bottom line, business for Normandy is up. It will be a while before the magic of a Billy Cobham record or two will draw clients to the studio, and a lot of the increased business was booked before the control-room conversion. But, as Greene says, "they won't hurt."

Greene figures that things will get even better, and puts it in this perspective: "With the current economic climate, people want state-of-the-art equipment with good personnel and service that will cost them in the $100 to $125 an hour range, which is where we are. Fancy rooms will only be for established superstars with huge recording budgets. Otherwise, the record companies don't want to hear about paying $165 to $200 an hour.

"Our equipment is not vast and awe-inspiring, but it all works, and you can make records in the place. I think that is what's going to make us successful." ■

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PRODUCTION VIEWPOINT:

Shelly Yakus

Interviewed by Robert Carr

Photography by Michael Jacobs

In the four years they've been together, the team of Shelly Yakus and Jimmy Iovine has collaborated with more big-name acts than most other engineer/producer partnerships ever dream about. Stevie Nicks, Tom Petty, Bob Seger, Heart, and Dire Straits are just a few of the artists who recognize and request this duo's golden touch.

Ironically, Jimmy Iovine started as Shelly's assistant, but found the lure of producing irresistable. When Iovine needed an engineer for his first session with Patty Smith, he was too embarrassed to ask his former mentor. If it hadn't been for Record Plant owner Roy Cicala's intervention, the two of them might never have realized the potential in combining their separate talents — the formula for what Yakus claims is one of their "secrets for success."

To take an inside look at the audio end of this winning combination, *R-e/p* literally had to pry Shelly away from a non-stop schedule of double-session days. What follows is a glimpse into his world of indefinitely specific recording techniques, and Shelly Yakus' quest for the elusive "perfect sound."

R-e/p (Robert Carr): You've worked with Jimmy Iovine for most of the last four years. Are your roles pretty well defined? You're the engineer and he's the producer? Or do the roles meld together?

Shelly Yakus: It's both. I would say that our roles are pretty well defined, but we interact when it's necessary. In other words, I basically do what I should do as an engineer to make our records sound interesting. He does, as a producer, what he should do to put me in the right direction.

Jimmy used to engineer, so when we mix he may sit down and get a basic balance. Then I'll get a sound against that balance. As far as me producing, I try not to. I make suggestions sometimes about my feeling on a vocal performance, or a track that might feel stiff. But I would mention it only if I felt that Jimmy was too involved with other situations in the studio, like trying to get the arrangements together.

R-e/p (Robert Carr): Why do you want to keep your roles so distinct?

Shelly Yakus: Because when two people are good at what they do, there is room for only one producer, and one engineer with a little bit of interaction. That seems to be the best way. You have the artist who is usually a co-producer, even though it's not on the credits. On our albums, we try very hard to include the artist in making the record. It's *their* record; it's not our record.

They come to us, because they hear other albums we've done and say, "Gee, I wish my album could sound like that," or "be arranged like that." So, in order to get that sound, it's not just the producer and the engineer making a record.

I've worked with producers that come in, and completely take over; the album becomes *him*. That does work with certain groups. But the people we work with have a very definite sound — Tom

Beginning as a Nashville session musician with a burning desire to be a producer, Larry Butler watched and listened. His first break came when he got a producer job with Capital Records in Nashville. The first record he ever cut, with Jean Shepard, was a hit. Since then he has cut over 50 gold and platinum records as producer for CBS, Johnny Cash Productions, Tree International, United Artists and now as an independent. His recent relationship with a man named Kenny Rogers, has produced hits like Lucille, She Believes In Me and The Gambler. Larry won the Grammy Award as producer of the year in 1980.

ON DEVELOPING A STYLE

"When I started producing, I was producing like everybody in town. I started to produce a record like Billy Sherrill would do it or like Owen Bradley would do it or whatever. And then one day I listened to a lot of records I had done and I thought now wait a minute. If somebody wants a record that sounds like a Billy Sherrill record they can go get the real thing. So I started producing the way I wanted to produce. It was a great lesson for me. It was a big turning point in my career. I think that nobody is really going to sell or really succeed until they reach that point where they're putting themselves into it, instead of making a copy of someone else's work."

ON REACHING THE LISTENER

"I'm a believer in the simplicity of a song. I believe in laying something in somebody's lap they don't have to search for mentally. I've said this before, if a guy's driving home from work he's got a million things on his mind. He's got to spank the kids when he gets there. He's got a flat tire on the way home. And through all of this there's a song. He's got his radio turned down kind of low and a song cuts through all of that and he finds himself humming along with it. When that happens you've hit one in the upper decks."

ON KENNY ROGERS

"Kenny is such a universal name, such a name. I try not to let any prejudice enter into comments about Kenny because we've been so close, but I guess he has to be the strongest single male artist in the United States. I can't think of anybody that's reaching the mass of people that he's reaching and I think it's unfair that people say he's the new Elvis. Well, there's never going to be another Elvis. There's Elvis Presley. That's it. Forever. But as far as sales, you might compare them."

ON KNOWING WHEN TO STOP

"I think the most common mistake for an engineer and producer to make is maybe not really realizing the take when they've gotten it. Sometimes going too far because they're looking for that emotion or magic. Sometimes you can have it and not realize it. Sometimes you can have maybe one guitar part that bothers you, so you go ahead and do another take. Well, you have gone by the one that had the feeling, the one that had the emotion."

ON TAPE

"I use the philosophy and theory of surrounding myself with people who know what the hell they're doing and letting them do it. I let the engineer do his job.

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I just know 3M has always been very, very open for ideas and suggestions. It's just like "money making music." Three M's. That's the way I think of the tape, because it works and it sounds great."

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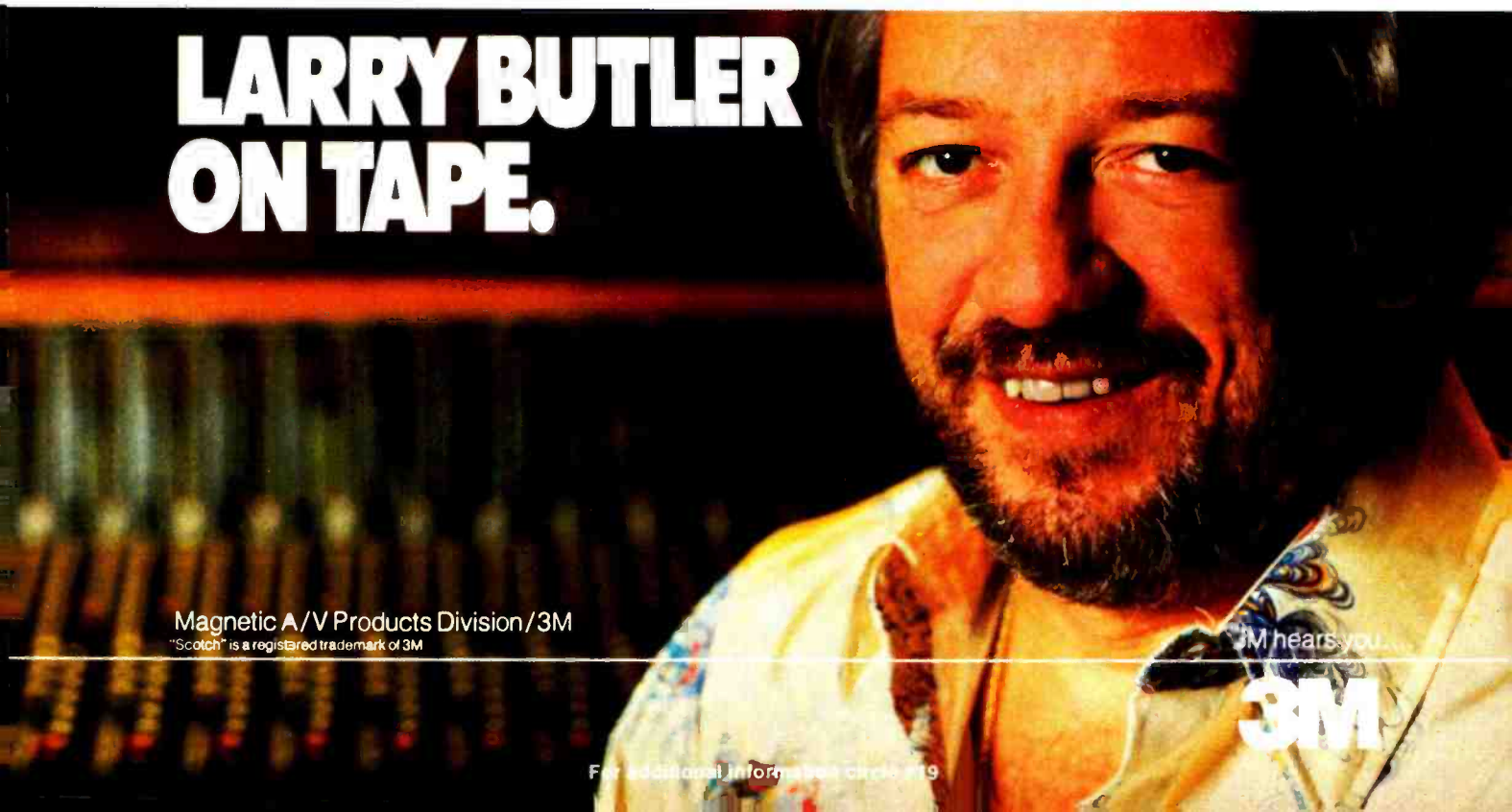
LARRY BUTLER ON TAPE.



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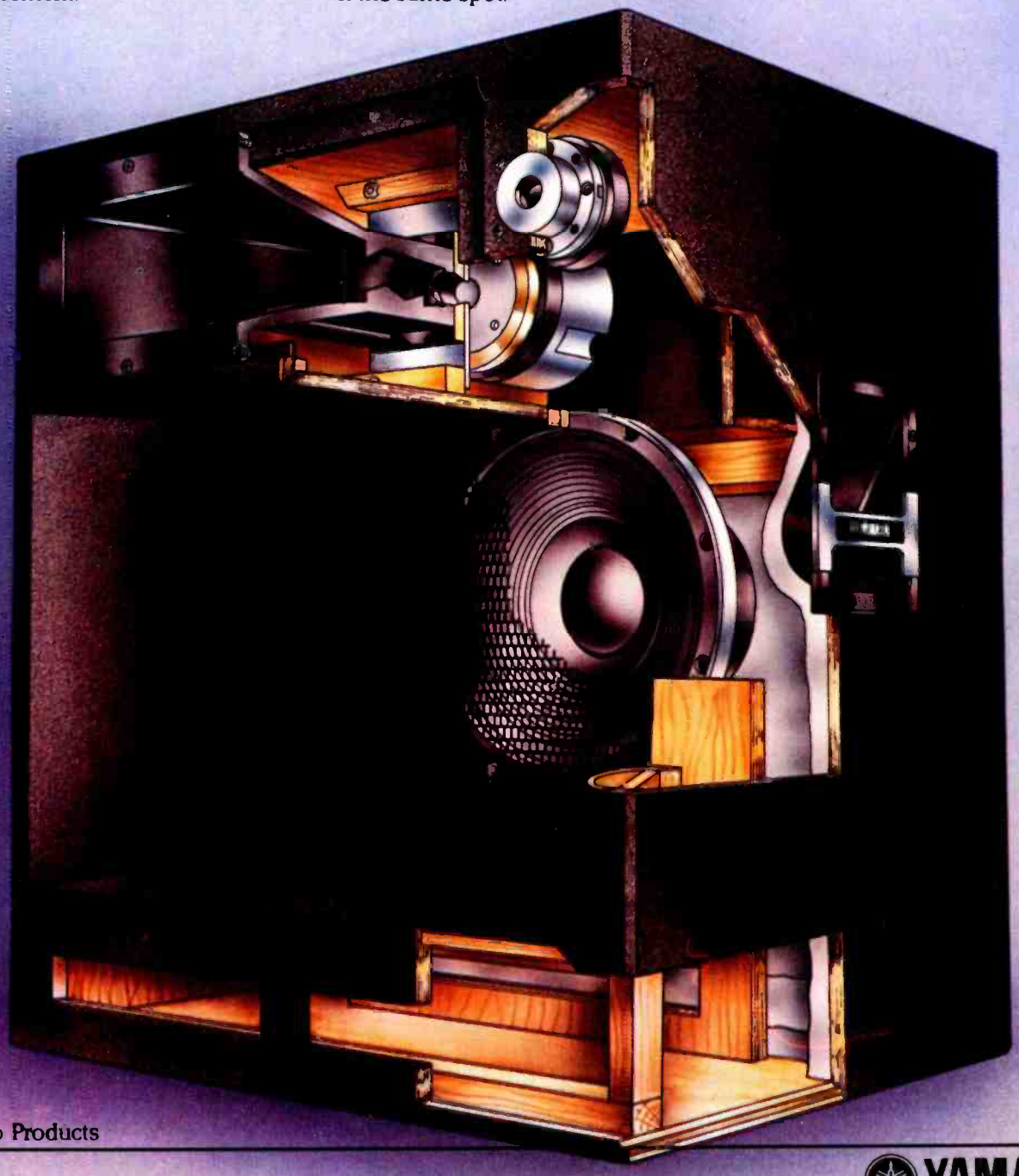

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PRODUCTION VIEWPOINT:

Shelly Yakus

Petty, Dire Straits, Bob Seger, and Stevie Nicks. We see them as people, writers, and musicians, and make the personality in their music come across as strong as possible . . . as strong as we can get it out of a car radio speaker.

R-e/p (Robert Carr): Do you, as the engineer, enter a project during pre-production, or do you meet the artist in the studio on the first day?

Shelly Yakus: I try to meet the artist either the first or second meeting they have with Jimmy — that's before pre-production. We talk and get to know each other a little bit; we may have dinner or whatever. Sometimes Jimmy will go to the pre-production, and I'll stay working on the previous album. I might concentrate on overdubs with one artist, while Jimmy is having dinner or spending pre-production time after the session with another. I try to stay fresh by not going, so the people we're [currently] working with still get 100% [of our attention].

R-e/p: Since Jimmy primarily does all the pre-production work with the group on arrangements, and so on, how do you prepare for a new session?

SY: After Jimmy's been through pre-production, I try to find out what the drummer is like; what the drums sound like; how it was to work with them, and what I can expect. I have a pretty good picture before I walk into the studio if somebody is sensitive about their instrument. Sometimes a musician has his favorite equipment, and a suggestion about changing it is offensive. For instance, Jimmy might tell me the drummer really wants to use his own drums. So we'll usually take a day to work on all the drum sounds, and try to cut something that night. We want to give the drummer the attention he needs to get everything happening.

If it doesn't work out, we'll suggest that I go to the drum store or drum rental place with him, and pick out some equipment together that might sound better in the studio. At least that way the drummer feels that he's tried his kit, and that it didn't work in this particular studio for the sound we wanted to get.

"A good solid snare-drum sound will stick through just about any overdub."

R-e/p: How about room set-ups. Is that left pretty much up to you?

SY: The set-up of the room is usually discussed between us. Jimmy told me that he wanted to cut Stevie Nicks [*Bella Donna*] in the middle of the room, and record the vocals live. That's really tough; she's standing 10 feet from the drummer, with no gobos around her!

I've found that the more baffles we put around the instuments, the deader they sound, and we don't want that. So, to get a live-sounding recording, and still have the vocal clean enough to use in the end, was very difficult. We tried to pick mikes that rejected leakage, and we also relied on the volume of the instruments in the room.

Oddly enough, the louder they are, the *less* leakage you get from other instruments. In other words, if you have two guitar amps side by side — and sometimes we put them right next to each other, against the wall facing out into the studio, with a low divider between them — you don't get any leakage at all, as long as the volumes are equal. If one amp was lower in volume, you'd have the other one in it in a second. But we try and keep the levels in the studio as workable as possible.

The amps have got to be a certain volume in order to sound right. You can't ask the guy to turn it down. All I can ask is, "Turn it down until you lose the sound, and then bring it up a little bit." That gives him back his sound. Now we have the sound he wants, at the lowest volume we can use.

Sometimes the player can get the sound he wants at, let's say, 5. But if he turns him amp up to 8, it may still be the same sound, just louder. At 8½ it may go into some distortion, and a different sound. If the same sound works at 5, I'll take that. The difference between 5 and 8, or sometimes 5 and 6 on the amp, causes a big bleed in the studio. So we're always trying to help the instruments work at the best possible levels, to keep the sound and the separation right.

R-e/p: Wouldn't you ever use gobos to isolate the drum tracks from the rest of the basics?

SY: I can't remember ever putting gobos around the drums. On the first Tom Petty record [*Damn the Torpedoes*], we had some hard, reflective gobos in

DRUM MIKING CONCEPTS AND RECORDING TECHNIQUES

"The sound of the whole album depends on the drums, Shelly Yakus offers. "If you start with a 'little' drum sound, how can you get a big guitar sound without covering up the drums in an instant? That means you have to settle for a little guitar sound to match the little drum sound. At that point, you either put a little vocal on top or, if you make it a big vocal, you've got a big vocal on top of this *tiny* track, and it sounds like a commercial; it's ridiculous. So the drums are critical, because the *bigger* the drum sound, the bigger you can make the rest of the record.

"A set of drums should be made, from top to bottom, as big as possible. I'm talking about getting the most distance in frequency between the snare and the bass drum. I don't mean tightening the snare way up, and equalizing it really high. For the type of music that Jimmy Iovine and I record, we get the bass drum tuned as low as possible before it starts to sound 'flappy,' but it still sounds *clear*. The snare is tuned to the range that's right for the song, and that gives us the most separation between the bass drum and snare, as opposed to a disco sound, where the snare sounds like the bass drum. If you get that big distance, then the vocal can go on top of that.

Bass Drum Pitch

"By placing the drum low in pitch, the bass can go down there with it, which leaves the whole mid-range of the record open. On the other hand, if the bass drum is too high to begin with, you have to push the bass guitar up to meet the bass drum. That puts them both close to the snare. As a result the whole sound gets smaller, and doesn't leave any room for the guitars. But it's tough to get the bass drum tuned low, and still get *punch* out of it. That's why everybody tunes it up higher. Try and get that sound with the bass drum tuned low; that's the trick.

"How do you get that distance? Years of experience. Years of learning which mikes work for cymbals; which overheads to use; which snare mike to use; and which tom-tom mikes. How to set up the kit in the room, and whether to use a rug or not. All these factors contribute to the final overall sound.

"Drums are one of the toughest things to record. I thought I knew how to record Tom Petty's drummer, Stan Lynch; he's got a great sound in the studio. But he'll go on the road for three months, and have a different sound when he comes back. Then I have to start all over. Drummers tend to get into alternate playing styles on the road. They hit the drums differently; they may not hit the middle of the drum; or they might start hitting the rim to make the drums loud. If a drummer does that in the studio, there's not a lot of tone that comes out of the snare. Sometimes you have to get the player to angle the stick so they hit more head and less rim. For a while I couldn't get enough tone out of Stan's snare. It sounded like the edge of a pie plate!

Distance Miking

"We always mike the drums as far away as we can, but we can only go so far before we pick up too much cymbals. The average distance is about one foot away from the tom-toms. The closer the microphones are placed to the toms, the *muddier* they sound;

"I've worked with producers that come in, and completely take over; the album becomes him. That does work with certain groups. But the people we work with have a very definite sound."

front of the drums to make the room a little more live. But he wasn't boxed in on all the sides.

R-e/p: While working in the studio, I've noticed that not using gobos allows the harmonics of the instruments to marry together for a rich, musical quality. But as soon as the gobos went in, they seemed to cut down some of the harmonic content, and the instuments didn't blend well after that.

SY: They kill the high-end, and the sounds don't blend; gobos can actually *ruin* the sound. We try to use reflective ones rather than ones that deaden [the sound]. We think of them as "dividers," rather than something that *kills* sound. If the studio doesn't have that kind of dividers, we put a piece of plywood on both sides — that keeps the guitar sounds bright and clear.

R-e/p: How do you control leakage from the bass guitar when you record it live? Don't the low frequencies travel all over the floor?

SY: Right. We do put gobos around the bass — we have to, because that bass leakage runs along the floor and right up through the bottom of the piano. So when I say we don't use gobos, we don't use them in the sense that everything is built into a little house.

DRUM MIKING CONCEPTS . . . *continued* —

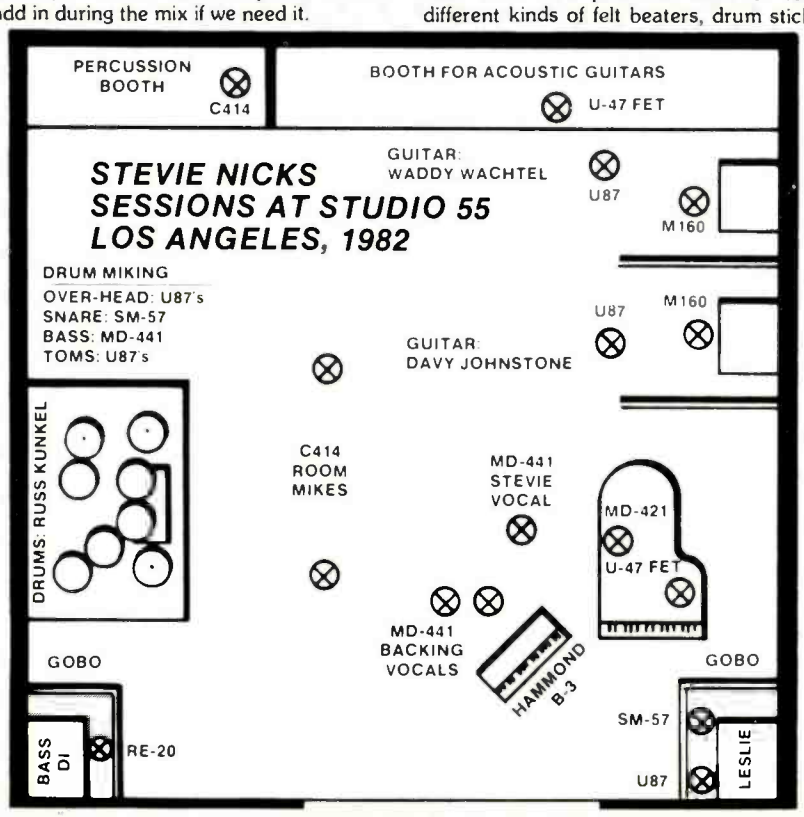
the farther away, the clearer, until you get to a point where the presence disappears. We try to keep both heads on the drums, and never mike them on the bottom. To avoid cymbal leakage, we use one mike for two tom-toms. That way we reduce the number of open mikes on the kit. For some reason, using a Neumann U87 on the toms gives a very clear sound.

"We put one mike on the top two toms, and another on the one or two floor toms — one mike between each pair, and each mike on a separate track. Then we mix the overhead mike in with those, and that brings a little bit of the hi-hat. We also record the high hat on a separate track, so we can have control over its volume in the mix. Very often, the hi-hat won't be very loud when you first record but, during the mix, it will get 20 times louder as soon as you touch the toms with EQ. We combine the tracks, and try to get the hi-hat as loud as we can in the basic tracks, but still have it on a separate track to add in during the mix if we need it.

"This is a good approach to recording the hi-hat, because sometimes we need an extra track. If we're lucky to have gotten the right balance on the original drum tracks, we can erase the solo hi-hat.

"I hardly ever place the bass drum mike too far into the drum or along its center axis. It just doesn't sound good. Usually, the drums we use have some sort of a front skin on it with the center cut out. We use that front skin to hold the blanket inside, and position the microphone right at the edge of that head. Then we'll move it around from there. I've had instances where I couldn't get the bass drum sound after trying everything. So I asked the second to go out into the studio, and with every bass drum hit he'd move the mike to a different spot. Finally we found the one that sounded right.

"If I find a drummer's kit doesn't give us the sounds we need, I'll offer to go to the drum store or instrument rental company with him. We'll pick out three or four different kinds of felt beaters, drum sticks



R-e/p: You mentioned recording Stevie Nicks live in the middle of the room. She seems to have a delicate voice — more so than Tom Petty, or Bob Seger. Do you record all the vocalists that way?

SY: We also put Tom in the middle of the room. We try not to put him in a booth, either. It's uncomfortable to be closed in, and still try to talk to the band. Even though you can communicate through a mike, you feel separate.

For "Hard Promises" we put two, padded, seven-foot high gobos behind him in a "V," which stops the sound that bounces off the back wall. The front of the house is open, and we put a little roof on it. We want him to feel he's still in the room with the rest of the group, but we need some isolation to stop the excess leakage. There's still some on the mike; you see it on the meter, and hear it, but it's down at a point where it doesn't interfere.

We don't build any kind of house at all for Stevie. For some reason, her vocal mike [Sennheiser MD-441U] rejects the room better. But that mike doesn't sound right for Tom. We use a Shure SM-57 for him. His band is also louder than Stevie's. She actually has the girls singing out in the room with her; just two background singers right beside her, like they used to cut records years ago. It makes her "feeling" better, because she's actually standing right in front of the drummer, and all the other musicians are around. They all have eye contact, and it starts to rock in that room.

R-e/p: Sort of like a party, then. Why the Sennheiser 441 for Stevie's vocal?

SY: It's a mike that she uses live, and found that it worked well for her with Fleetwood Mac. She told me when we first started working together that she really feels comfortable using that vocal mike. I had never used it that way before. It worked great.

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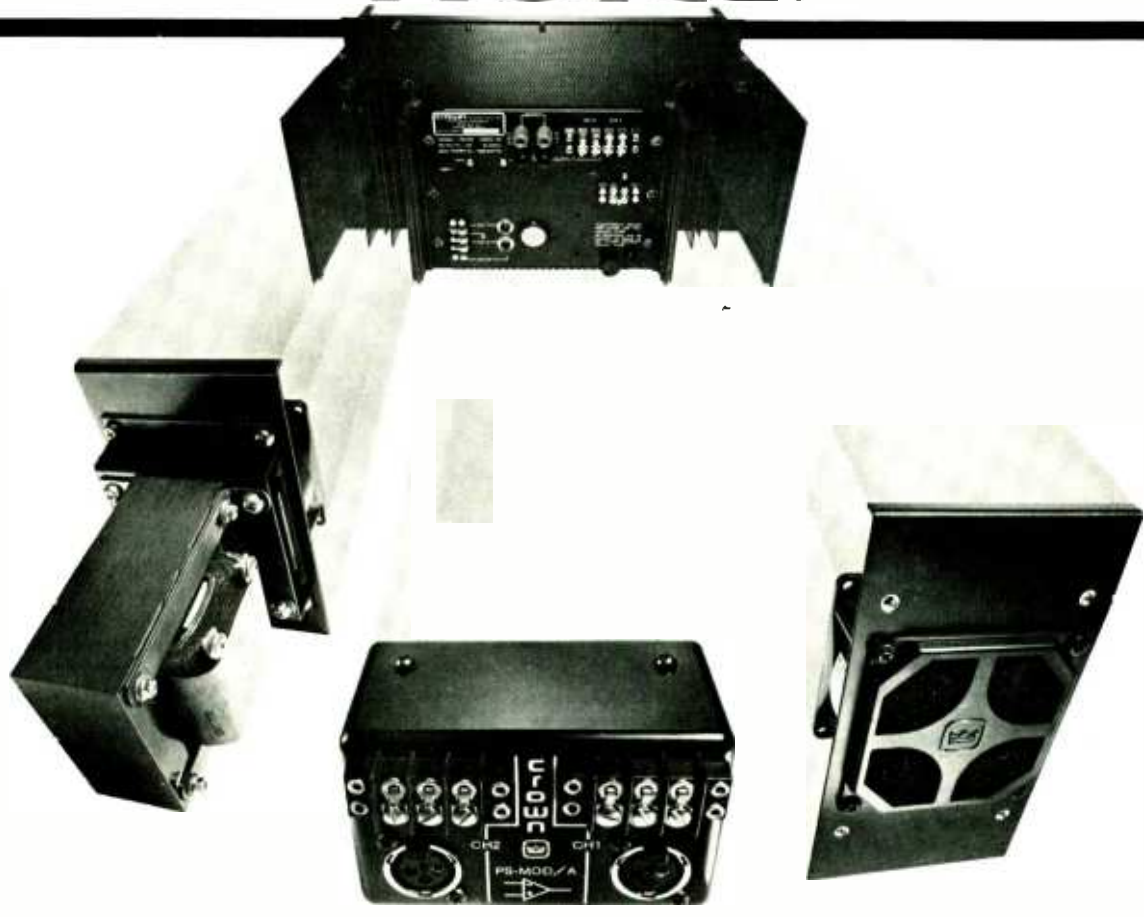

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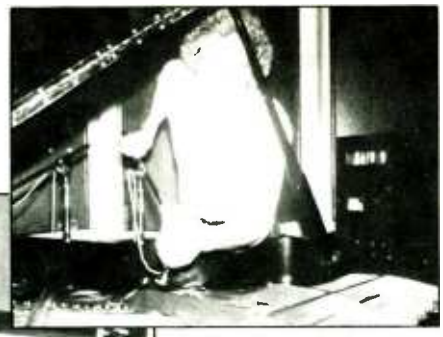
PRODUCTION VIEWPOINT:

Shelly Yakus



R-e/p: One song from Bella Donna, *"Kind of Woman," has a smoothness to her voice . . . almost like an airbrush effect on a photograph.*

SY: That's called Sexy. That's how she sings the song — it's own her voice. I didn't really do anything to it; we helped it sound as clear as it could without taking that quality away. I remember that during the mix I tried to make her voice sound so clear that the whole essence of the song disappeared. We had to go back to the basic sound and start again.

As a matter of fact, an engineer by the name of Don Smith had a lot to do with the entire album, in terms of his mixing and suggestions about effects. We mixed "Kind of Woman," "Stop Draggin' My Heart Around," and "Outside the Rain," in a different studio [Goodnight LA, Los Angeles] than we did some of the other tracks [Rhumbo Recorders, Canoga Park, California]. Those songs had more of that quality in the vocal. One of the reasons they came out like that was that the monitor speakers were brighter than we were used to. I didn't use as much top-end as I would have at another studio, and it kept her voice warm and full.

I usually use a UREI LA-2A [limiter] and a Pultec [tube equalizer] on the vocal. For some reason, it didn't sound right, so Don [Smith] suggested using a Neve limiter in the board. I think we either took the Pultec out, or changed the setting on it to less high-end, and that enhanced the sound. But, primarily, that's her voice. I don't remember the settings, because I'm not familiar with the limiters, and Don knows the console so well. But that setting wouldn't work for another vocal. That's what I find about a lot of the equipment we work with. If we used the same setting on "After The Glitter Fades," or "Stop Draggin' My Heart Around," it would sound too *thin*, and too clear. We'd have to find a different setting with another limiter.

R-e/p: Do you usually carry equipment with you when you go from studio to studio?

SY: I have three mikes: two 441's — one sounds completely different than the other — one I use for vocals and one for bass drum; and a 57 that I used on *Damn the Torpedoes*. I liked the snare sound so much that I bought the mike from the studio.

No matter what the company says, all microphones of the same brand and model don't sound the same. You can put up five 57's, and they'll all sound different. You might put up six and find two that sound the same.

There's also a big variation between Neumann U-87's. And, as the Neumann 47-FET's are getting older, there's getting to be big differences there, too. When the 47-FET mikes were all new, they were pretty similar. But as they age, the variations are showing up as "brightness,," "dullness," "boxiness," "clearness," "thinness," and so on.

When we're looking for a vocal sound, we put up so many mikes it looks like a press conference! If it's an artist we've never worked with before, we'll put up about seven microphones. During three minutes of one song, he might sing a couple of lines on each mike until we find one that matches his voice; kind of like tailoring a suit.

We'd probably try two 47's, two 87's, maybe a 67 [all Neumanns], a Sennheiser 421 and a 441. We've found that the 47-FET works best for most vocals. But, then again, if you go into a very bright, clear studio that has a hard wood floor, that mike could be *too* bright. Then we'd have to go to a good-sounding 87 or a 67. You have to balance the mike choice with the room and the artist.

As we get to know the artist better, there's no need for so many mikes, unless the studio is new to us. With Tom

DRUM MIKING CONCEPTS . . . *continued* —

he's comfortable playing, cymbals, and a bunch of heads. We used what are called 'Pin-stripe' heads on Stan's tom-toms. His toms are very live shells, and I thought we had come up with the wheel when we put those heads on his drums. They sounded like the biggest tom-toms we ever heard. Then I tried them on the next drummer I worked with, and they didn't work at all. I felt like a jerk, because I told him how amazing they were. But they were terrible for his set.

Bass Drum/Guitar Interaction

"Another major relationship to consider is the interaction between the bass drum and bass guitar. We put a lot of strange effects on the bass drum for Dire Straits 'Skateaway,' on the *Making Movies* album. Oddly enough, the effects actually made it easier to

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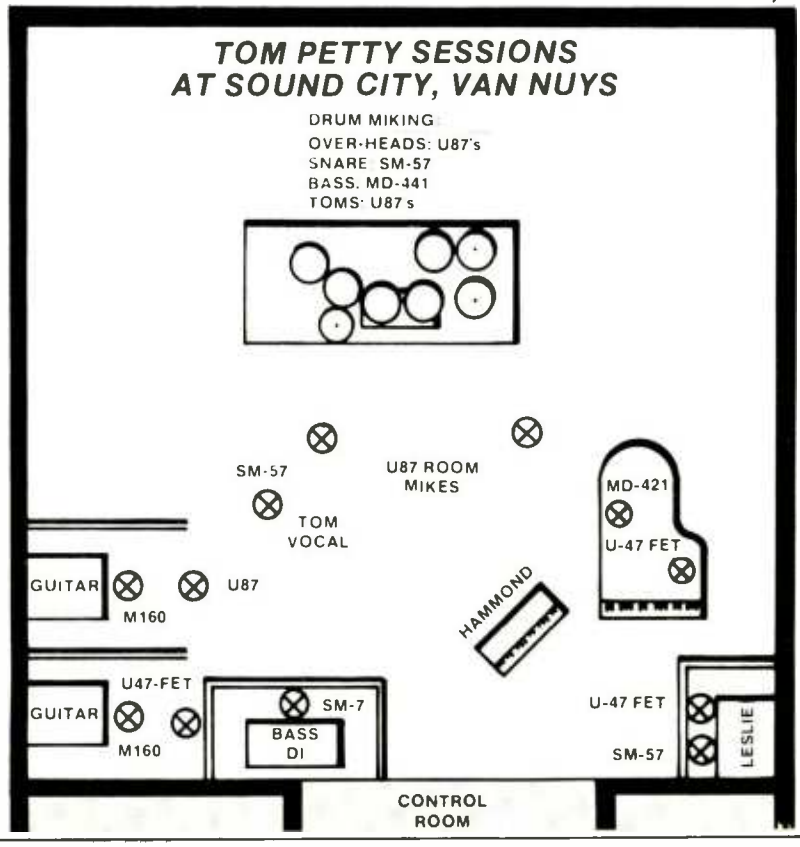

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PRODUCTION VIEWPOINT:

Shelly Yakus

Petty's second album, I put up three 47's, because I knew that's what sounds best on his voice for overdubs; I just didn't know *which* one would sound the best at that studio.

A rock'n'roll-sounding voice is more difficult to record. If you have a mike that's "raspy" sounding, or rough sounding, you can't put that together with a raspy voice; it's a real bad combination. You need a choice that's going to counteract what his or her voice sounds like at the time. You can usually find that characteristic within the same type of mikes, such as from one 47 to another. One will accent what we don't like on the vocal, and the other will compliment the vocal.

R-e/p: You sound like you would prefer to go for very little EQ. I assume that most settings would be fairly flat then?
SY: Right. We use very little EQ; sometimes we don't use any. In the mix, we always have to EQ the vocal to get it over the track. Very often when we do the vocal overdubs, the track isn't finished yet, and it's hard to know what the sound should be. If I EQ the voice a certain way on the basic track, I might not be able to alter that EQ when we get to the mix.

R-e/p: Would you ever record a couple of contrasting vocal tracks at the same time on two separate tracks using two different mikes?
SY: I did something similar to that. Tom Petty's vocal sound was wrong on the chorus of "A Woman in Love," so we used a 47-FET for the verse to make it clear sounding, and an 87 for the bridge.

R-e/p: You mentioned you also carry some outboard gear with you from studio to studio . . .
SY: . . . we have a couple of Pultecs, and about 15 API 560 graphics. API just started making them before they went out of business, and they're super live. And two UREI 1176 limiters that are especially clear sounding. We rent the equipment from a company in New York that gives us a good rate; it's always the same pieces.

R-e/p: Are there any instruments that you tend to limit most of the time?
SY: Jimmy and I do have a sound, but we try not to get locked into a formula. I remember mixing albums where the bass on the album was only limited when it was recorded, and not limited when it was mixed. Usually a bass gets limited twice to get it to work. I remember that on the Patty Smith *Easter* album, the bass just sounded better not being limited.

Generally I'll put a limiter on one of two guitar mikes — the close mike to keep it "full" sounding. Then I add the straight room mike to it. I like to use a dbx 160 [compressor-limiter] on the bass guitar direct, and not limit the live or amp mike. We record those on separate channels, and blend them during the mix . . . we fool around with the combination we want later. I would say the vocal always gets limited.

R-e/p: It couldn't be very much?
SY: No. We use a lot of equipment when we mix, but we don't use much of any one piece.

R-e/p: I could tell there were effects on instuments, but I couldn't really hear them.
SY: We try to make the effect a part of the music. Jimmy and I bring our own pair of little ROR speakers [made by ROR Audio Research, New York City] that helps us with the balance of the effects and sound sources. We have two of the first few ROR's that were made. They are the same size as Auratones —only one speaker — but they sound very different and, for us, they're more accurate.

What you can't hear on any small speaker is low bass, and the mid-range is usually louder than it should be. Which makes you think you have tons of guitars in the mix. But, when you throw the track up on the big speakers, the guitars go right back into the mix. You have a lot more drums and vocal than you thought, because of that mid-range spike those speakers tend to have. Or sometimes they're so bright that you don't use *enough* equalization. Then, when you leave the studio, you don't have anything but mush!

I don't have those problems with the ROR's; they're very smooth in the mid-range. They make you push parts up louder, rather than put EQ on them. I push the instrument louder, and then put EQ on it to make it sound right, rather than equalizing it first, which is standard procedure with other little speakers.

R-e/p: When we were planning to get together for this interview, you told me you were going from studio to studio trying out speakers. Are you a speaker junkie?
SY: [Laughter] We don't like doing all of our projects in one studio, because it helps make the album sound more interesting [if we change recording venue]. We might do the tracks and some of the overdubs in one place, and then go somewhere else to finish the album. Changing studios at a certain point in the album freshens everybody up. You don't get locked into being in the same room all the time — that feeling of being in a *rut*.

We also don't like to mix on the same console we record on. Most consoles don't have parametric EQ, so you're locked in to using those frequencies that you feel most comfortable with. If the choices are 1.8 kHz, 3.5 kHz, 5 kHz, and

DRUM MIKING CONCEPTS . . . *continued* —

hear the bass and bass drum.

"The bass guitar and bass drum are on the same plane in terms of presence, and sometimes that presents a problem. When they play at the same time, the combination of the two makes a sound which, in that instance, can be a great sound; there's a lot of power in those two instruments hitting at the same time. Other times though, the bass drum plays in between the bass guitar, and the bass drum, it *won't* stand up. It may be a duddy, boring sound. For instance: on 'Skateaway,' we put an effect on the kick, and the bass drum moved to a different plane than the bass. The presence in the bass drum changed so you could distinguish between the two. The effect actually did make the two instruments work better than if the effect wasn't there.

"As a result, the drums on 'Skateaway' sound like they were recorded on a manhole cover on Fifth Avenue between two buildings. The sound was achieved with digital delay, some echo, and some tape delay. What we didn't expect, but which sounded great, was that the tom-toms came out spinning: the drummer hits the tom, and it sounds like it's going end over end. Initially, it was the bass drum that we put through that effect, and then the bass drum and snare. The effect was a DDL, echo, and DDL repeating on itself, but we smoothed it out with echo so you couldn't hear that. It was really a *nasty* noise by itself.

"A bass guitar taken direct is a very *dead* sound. But once you add a mike to it, the sound is livened up with some added presence. Similarly, if we put too much blanket inside the bass drum to stop the head from ringing, it makes the kick dead, and brings it up to the same presence as the bass guitar recorded direct. At that point you can lose the bass drum. We try to get the kick semi-live to create the right combination of bass and bass drum, so that the two remain more separate and distinct.

"Besides what I've said already, I can't give you too many specifics. Jimmy and I record differently every time; we use the same mikes, but the procedure varies. It depends on the ideas I get when I walk in to the studio.

"Let me use our recent session at the Power Station in New York as an example. We put the drums in a live room, and they just disappeared in all the room sound. Since they have a piano room — a room with a peaked ceiling, hardwood floor, no rug, and glass doors opening into the main room — we put the drums in there, opened up the glass doors, and let the sound come out into the big room. Now, the Power Station has mikes mounted in the ceiling that go up and down on a motorized switch; the engineer can get any height he wants. We dialed a height we liked. In this case, that tightness in the piano room worked for the drums, yet we had the main room sound on additional tracks that we could combine with the drum sound to get the best combination of both. In other studios we do it differently. There are no absolutes — just some ideas and your ears." ■■■

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PRODUCTION VIEWPOINT:

Shelly Yakus

7.5 kHz, every engineer has his favorite EQ point for a particular instrument. Let's say you pick 3.5 kHz for a guitar. When you mix that guitar through the same board again, you're probably going to pick 3.5 again. It's a natural thing to do, but you don't want to do that, because you've already equalized it there.

I'd rather take the track to another console with different EQ points. Even if it says "3.5" on it, it's a completely *different* 3.5 — the bandwidth is not the same. When you add that, the sound comes alive. Instead of equalizing everything narrow twice at 3.5, you're adding EQ once at 3.5 and maybe 4.8 kHz on the other board, or 3 kHz even. You touch that equalization, and it brings out a different part of the sound that you're trying to get.

Even if you have a parametric, the sound tends to get small sometimes when you're re-equalizing in the same place. The speakers dictate where you're going to put that equalization. If the speakers are deficient in a certain area, or the room is lacking in a certain area and causes you to got for a particular EQ, it may or may not be right. That's why moving works the best for us.

R-e/p: Doesn't changing studios make the job more difficult for you? You, especially, have to absorb so many changes so fast?

SY: It's very difficult, but the seconds that I work with make it a lot easier. And it's worth it in terms of the outcome of the album. It really is. Sometimes we walk into a studio, and that sound doesn't happen. Then we leave.

First of all, the problem with using a few different studios is that I worked in one studio — the Record Plant in New York; usually studio B — for 10 years, and three years before that at A&R. I don't see myself as an independent engineer, so I have to try harder when I go into a new room.

When Jimmy and I started working together, we got the opportunity to do Tom Petty, but we had to come out here to LA to live. We never saw the studio before, and it was hard to get the right bass sounds, and what we wanted in certain areas. Every room has peculiarities, and knowing about them makes it easier. We couldn't get the rough mixes to come out finished sounding there; we'd always end up with too much drums, and not enough guitars.

Now especially with Tom's band, the balance of the instruments is *crucial;* the track will actually appear to change tempo with the wrong balance. If the guitars aren't loud enough, and the track is drum heavy, the song seems to slow down. I can't explain why that is, but it just happened to us the other night in the studio. I even checked the speed of the machine, because I thought the tape was running slow.

In any case, we went to Cherokee [Los Angeles], where we found we could balance the tape the way it should be. They had a Trident A-Range, which is a great board. We recorded on an older Neve console and a Studer machine, which is also a great combination. But we finished the record at Cherokee.

The next project we got was Dire Straits, and we cut it at Power Station in New York. That was touchy, because I was vice-president of Record Plant at the time. Jimmy and I made a terrific record at Power Station, though. We had worked at the Plant for so long that we

wanted to try something new. That was the beginning of us going from studio to studio. It gave us the confidence to walk into a new room and make it work.

The biggest problem now is getting the monitors to sound the way we're used to hearing them. Everybody's monitor system has a completely unique sound. But we have to be able to hear a certain way to do what we do. I have a reference tape of one of Tom Petty's songs — "Don't Do Me Like That" — which is simple instrumentally and frequency-wise. I hear it in terms of bottom, middle and top, rather than a lot of parts going on. It's got a definite bottom, middle and top range rather than a wall of sound, even though it ends up being very musical on the radio.

We play that tape in the control room, and if the speakers are not what we're used to, this song shows up the differences in a second. Then we ask the studio owner if we can put our graphics on their monitor system, and tailor the speakers to Tom's song. Once we have this song sounding like the day we mixed it, we play another song that has its own characteristics, using the same monitor EQ to see if the settings hold up. If they don't, we trim them a little bit so both songs sound right. Then we have a monitor system we can hear on.

Once in a while we get fooled, because occasionally there are very narrow mid-range peaks on the speakers that can't be detected until you do a rough mix, take it out to another studio, and find there are no guitars! The mid-range instantly pushes the guitars right out. You think you have enough, but you really should have pushed them up further. So, to avoid that problem, after the first day in a new studio we always take what we did to another studio and listen. We buy time for an hour and listen on any speakers for anything that might show up. That way we can correct what's wrong before it's too late.

R-e/p: Being so busy, how do you stay up on all the new equipment? Or does the gear just seem to find you?

SY: Any time a producer or engineer

has hits, and becomes popular, he becomes the center of the market for trying new equipment. But it's rare that I like a piece of new equipment. This is one of my beefs about the industry.

For instance: a company comes out with a great sounding limiter. Then a few years later, after they've sold tons of them, they announce that they're not going to make it anymore; they're going to come out with their new model. They say it's the same as the previous model, but they've improved it and changed the serial number. A lot of times they've just figured out how to make it cheaper. And it usually sounds *awful.*

There are some people who can design great-sounding equipment but, generally speaking, there are more that can't. The guy that bothers me is the one who wears a suit, designs the piece on paper at a desk, and never goes near a studio. He comes out with this piece of equipment that's supposed to revolutionize the recording industry in terms of limiting or EQ. I can't figure out if they believe it's great, or if they market it with the hope that someone will buy it.

The whole business is going towards digital which, to me, is a cold-sounding medium. A lot of the new boards that are coming out now suck, and you can quote me on that. Any board, except for Neve, that comes out with a gain control on the board for a pre-amp, and has no 10 dB pad, is garbage. It won't work for rock and roll. The board sounds cold . . . one-dimensional . . . flat.

Listen to Tom Petty's album, *Damn the Torpedoes.* People have told me the album sounds three-dimensional from

Shelly Yakus

"Some people say, 'Just throw a limiter on it.' You can't put a limiter on a bad sound. It just makes it worse . . . it just makes the bad sound limited."

front to back, not just flat across. I used a Trident A-Range console for that project; it has that deep, full, clear sound. When I mixed that with Tom, I looked at the speakers and said, "Tom, I can see you on the stage. I can see Stan [Lynch, drummer] behind you." That board allows that to happen. A Neve desk has that same depth. The fact that the business is going towards a colder medium shows me that a lot of people out there have no taste at all.

R-e/p: Do you think that maybe some manufacturers are striving for technologically excellent specs, and missing the intangible of a pleasing sound?
SY: That's right, and you can't do that. The radios in cars are getting like that, too. But that's alright as long as the music you play through it has some depth to it. The trouble comes when you play something that's been done on one of these new boards that sound one-dimensional — just flat, like looking at a piece of paper. You put those together in combination with digital recording, and you've got something that sounds like it was recorded by my dog.

Typically, you sit at one of these consoles, open up the pre-amp gain, and as soon as you move the knob, the snare drum is hitting zero or +3 on the VU. Now a board is not supposed to have that much gain in it, and still be clean. It's not clean; it sounds awful. I'm working on one of these boards now. The sound doesn't become "the sound" until the pre-amp is opened up to a certain point. I've put the fader up to the top of the board, left the pre-amp as low as it will go, and gotten a zero VU reading on a snare drum. When I pulled the fader down, and increased the pre-amp gain, and kept the meter at zero, I heard the sound change radically as the pre-amp opened up. It became fuller sounding until the pre-amp was open to the point where it broke up.

I have to run my fader up to the top of the board, and the pre-amp almost off in order to keep the console clean. If the guy starts playing the drums harder, the board starts breaking up. Where do you go from there? Your only choice is a 20-dB pad, which knocks the heck out of the sound completely; it's an awful sounding pad. And 20 dB is fine for live, but too much for the studio.

It's so aggravating. I had someone design some pads for me. A lot of the pads make the sound "boxy" — evidently it's a mismatch with the board. I've gotten into putting a 10-dB mike pad (15 dB for bass drum) out in the room between the mike and the wall connector, which knocks down the level before it comes into the board. That makes the consoles work, but barely.

The board is usually so "clear" sounding that you think the sound is ok. Then you realize that the sound was actually overloaded when you originally recorded it. One or two overdubs covers up the snare, which a good board is not supposed to do. A good solid snare-drum sound will stick through just about any overdub.

Yet the boards don't really go into complete distortion. They just get "small" sounding without the pads on it. You think that's how it sounds in the room until you go out and hear this screaming guitar. You go back into the control room, and find it sounds like a *wimp*. But as soon as I put the pads on, the guitar takes six paces forward in the monitor; it comes right out and sits in our laps. And all because I cleaned up the sound before it went into the board.

The EQ on some of these boards is another peeve. Just touch it right off the mark, and you have more EQ than you can possibly handle. You can't make records like that. I learned from Roy Cicala and Phil Ramone about going out into the room, and moving the mike to get the sound before you touch the EQ. Get the instrument to sound the way you and the player want it to sound in the room; move your mikes around until you capture that. Then use a little EQ, and limit it if you need to.

So many people say, "Just throw a limiter on it." You *can't* put a limiter on a bad sound. It just makes it worse . . . it makes the bad sound limited [laughter].

I like a lot of tube equipment, yet the API equipment is not tube. I'm not going to get locked into saying I wish I had a tube board, or all-tube limiters, or whatever, but I wish I had more equipment that sounded that way. I would like to see them come out with more consoles that have *feeling*. I don't mind if a console colors the sound, as long as it's the *right* color!

R-e/p: How did you get some specific sounds on the Stevie Nicks Bella Donna *album? The piano on "Leather and Lace" is such a "round" sound — almost like a glass bulb.*
SY: That's a Rhodes. It's just the way that the piano and [keyboardist] Roy Bittan sounds. We're very lucky to work with the players we have on the dates. They have great sounds, and their touch on the instruments is just right. What I have to do is capture that sound in the framework of the song we're trying to do But, to be honest, Jimmy recorded it when I was in New York. They do a lot to help me to look good!

R-e/p: The background vocals to "Bella Donna" have a "swirling" effect to them. How was that achieved?
SY: There was a lot of overdubbed voices that helped make that sound. We used an AMS DDL, which is terrific. We used a different time length on both sides, and that helped the swirling sound. Then we used a little tape delay, and probably sent echo from the tape delay.

R-e/p: But you don't really hear any of that detailed effect?
SY: No, we hide it. What we try and do is not to have the effect stick out, but rather to make it become part of the sound so the listener thinks that it's a sound. You can only hear so many things going on at one time. It gets so confusing, and "Bella Donna" is such a beautiful song. Jimmy figures out how to arrange the song, and make it the strongest possible presentation. Then I try to figure how to take that and make it sound strong.

R-e/p: How about the piano sounds on "Bella Donna"?
SY: That's Bill Elliott. Oddly enough, that's the most straight-ahead piano sound on the album. Depending on the register the part is played in, and the miking techniques, certain ranges in the piano are brought out more than others. Every song is a little different, because each player plays in a different register. He may happen to hit the register where the piano "speaks" best, or he may not.

I use two mikes on the piano. I have to move the position of the high mike, depending on where he's playing with his right hand. When I just happen to find the right spot, it only takes moving the mike just an inch, and it'll change the sound drastically.

It just happened that on "Bella Donna," the range he needed for the song was the best range for the piano. I had the mikes in the right place, and the EQ I was using brought it alive. The song before may have sounded awful on the piano, but when he switched to this song, the piano just jumped out of the speaker.

A lot of the sounds you hear on records are not due to the fact that we use some amazing EQ, or anything else. We just go for the most honest and full sound and, doing that, when the right combination of mikes and player and part happens, it really comes through.

The best example of that [approach] is the bass drum sound on "Here Comes My Girl," from Tom Petty's record. When you get a good sound, you can visualize it. It's there. Boom. This one came out of the speaker, across the board. And this was the same setting I had for the other bass-drum parts. On the record, that track stuck way out. It's the same thing with the piano. It's not always me; sometimes it is, but not always. Sometimes it has to do with the conditions in the room. It's very difficult to make records. If it was easy, everybody'd be doing it. ■■■

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THE FORMAT FUSION:

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Recording and Mixing of "INDIANA JONES" on 24-Track, Tascam 16-Track/One-Inch, and 3M 32-Track Digital

by Douglas F. Ordon

It seems a little ironic to me. This business we're in is supposed to be so innovative, yet there are so few real innovators. To my mind an innovator is more than someone who introduces a new idea, or a new way of doing things. An innovator is a person who has the courage to try something new; a person who is willing to stretch beyond his or her "comfort zone."

The recording industry has developed some traditional ways of doing things, and over the years the comfort zones have become more and more comfortable. For example, most music production begins on a 24-track, two-inch recorder — a proven standard. It's accepted. Seldom are there any deviations. People call a studio for a rate, and they ask, "What's your hourly rate for 24-track?" It's interesting how people get their minds locked in cement. There is almost an unwillingness to consider change, and many times tradition is nothing more than that . . . tradition.

I would like to set the record straight right now, however, by saying that I'm *not* being critical about the 24-track, two-inch recording format. It remains one of the mainstays of the recording business; a fantastic piece of equipment. In fact, in many cases it's probably the best format for a music production. My point is that there are *options*.

Not every project requires the capacity available with 24-track; I cannot see why someone would want to pay extra for extras that will never be used. (Which is somewhat like chartering a 747 to transport a baseball team.) The types of projects that I'm referring to might include the video market. Television people aren't particularly concerned about what type of format to use. Their concern is: Will it get the job done? While they still use 24-track, we are seeing television audio engineers shifting to alternatives.

Another type of project would be music and commercial demos. You might have a song or a jingle to sell. You want to get a good sampling to your prospective buyer, but you don't have the budget to go 24-track. And there's no way you're going to make much of an impression with a recording made on a hand-held cassette machine! In each of these examples the perfect alternative just might be 16-track, one-inch — the result of today's high technology.

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At this point, some *R-e/p* readers may be saying, "That's interesting, but does it really apply to me? I'm marginal —24-tracks are more than I need, but 16 aren't enough." Don't be too sure. This article opened by talking about innovators; people with the courage to try something new and different. What follows is a story of real innovation, with astounding results. The remainder of this article will describe the remarkable application of three basic recording formats — 16 on one-inch, 24 on two-inch, and 32-track digital — each of

— the author —
Douglas F. Ordon is the President of AVC Systems Incorporated, a professional audio systems house with facilities in both Minneapolis and Chicago.

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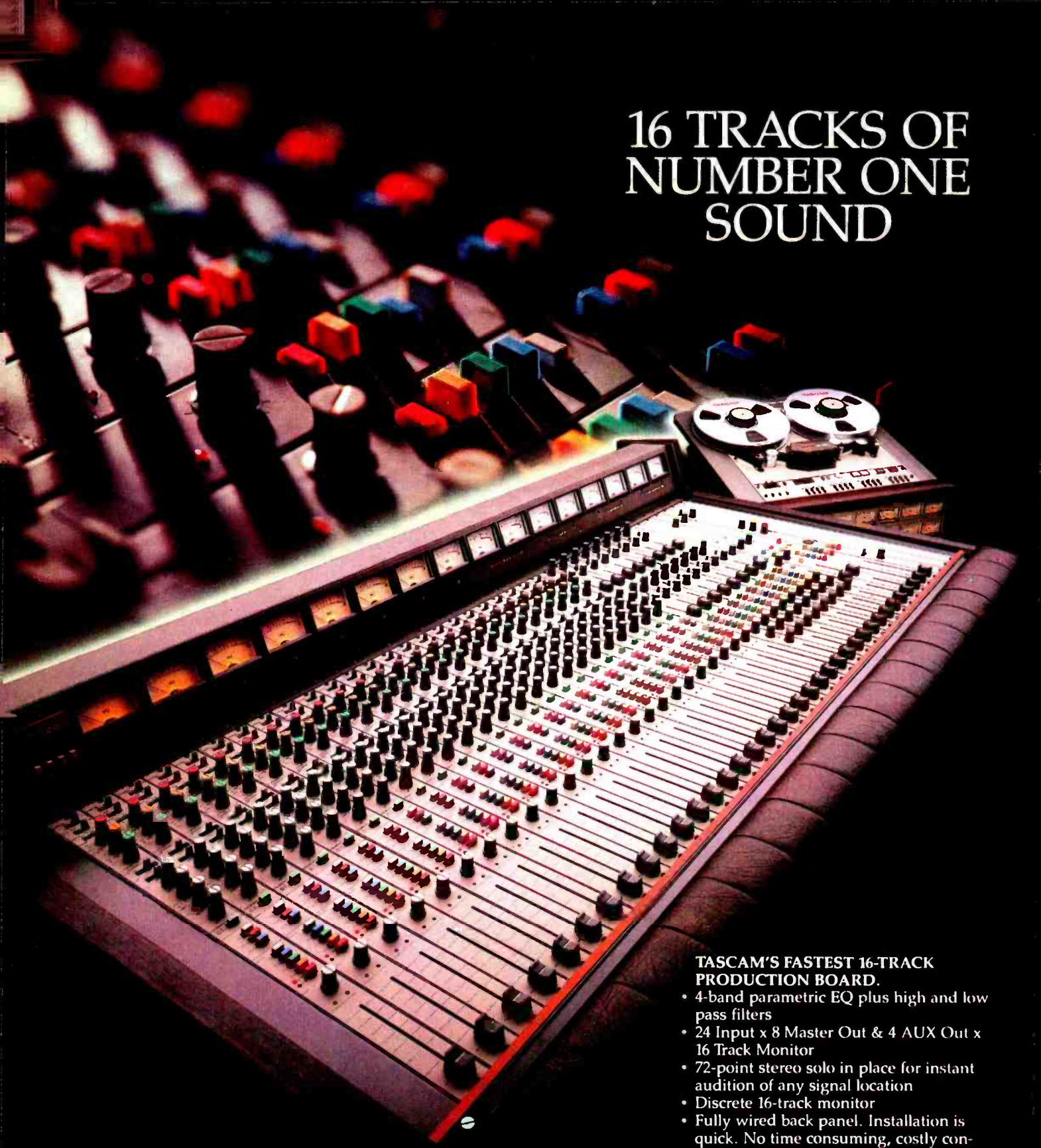

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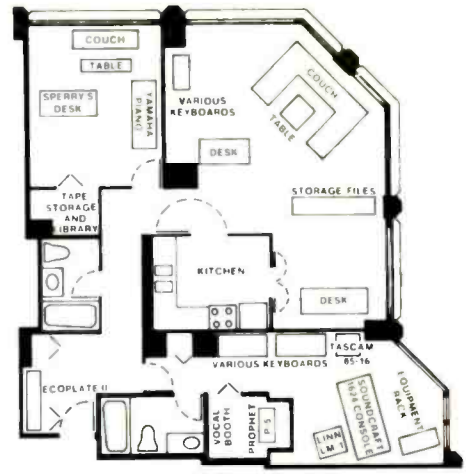
THE FORMAT FUSION
Tascam 16-track/3M Digital

which was chosen to make the best and, in most cases, economical use of resources during the production of a demo project, entitled "Indiana Jones."

A Marriage of Convenience

At the center of this story is Steve Sperry, arguably one of the top commercial producers in the Chicago market. Sperry got his start in music as a player in a rock and roll band during the late Fifties. The next progression was to record production. He moved to Chicago from Wisconsin in 1968 and, except for time spent in LA and Nashville, continues to call the Windy City home. Always a prolific songwriter, Sperry decided to try his hand at commercials in the early Seventies, and spent several years perfecting his craft while working for other commercial producers. During this time he made a record, *Flame*, which charted, as Sperry puts it, "for about 20 minutes." He formed Steve Sperry and Co. in Fall 1978, and has been building his reputation as a premier jingle producer ever since.

Steve Sperry has one of the most unusual and, I must say, comfortable recording studios ever encountered. First off, it's located on the 42nd floor of a fashionable apartment building, and has a spectacular view of the city and Lake Michigan. It's a small studio, yet for much of his work Sperry doesn't need the Coliseum. Every room has a function, and there's not an inch of wasted space. The living room/office is very nicely decorated with a compatible mix of contemporary furniture, office equipment and audio gear. The walls are laden with artwork, plaques, certificates and other industry awards.



EQUIPMENT LAYOUT OF STEVE SPERRY'S "THE MULT SHOP" STUDIO

One of the two bedrooms is filled with enough electronic goodies to boggle even the most blase of observers. A second bedroom serves as his office, client demo room and tape library. A piano, interconnected to the recording equipment, also shares the room. The remaining rooms — kitchen and two bathrooms — function as they should. With facilities to fix a snack, take a shower, or crash for an hour or two, it's small wonder that the studio has been affectionately dubbed "The Mult Shop."

Before any more of this story unfolds, it's important to introduce another very important person, Gary Hedden, recording engineer and electronics expert. Hedden began to develop his skills doing remote recordings while still a high school student in central Ohio. Over the next few years he also started to blend in his second love, electronics. In 1970, Hedden became chief engineer for a studio in Cleveland which, in addition to 16-track music recording, had film-mix capability. This latter resource provided Hedden with the opportunity to gain experience with synchronous sound, a skill that would serve him well, as will be seen later. Hedden moved to Chicago in 1975, picked up a partner, and built a recording studio in the suburbs, appropriately named "Hedden West." The new business grew rapidly, and two years later a disk-mastering studio was added.

With a successful business comes increased administrative responsibilities, all on top of time spent in the studio recording music. So two years ago Gary Hedden took a long, hard look at his personal and career goals, and made some tough decisions. He left Hedden West and became a free-lance engineer and consultant; "dabbling in all ends of pro audio," as Hedden puts it.

Then something special happened. Dick Luebbe, a Chicago stockbroker and a friend of both Sperry and Hedden, seeing the potential of the pairing, introduced the two men about a year-and-a-half ago. Steve hired Gary to do some calibrating and other odds and ends. A friendship and professional

. . . continued overleaf —

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Console and Tape Machines:
- Soundcraft 1624 mixing desk, equipped with 24 input modules
- TEAC Tascam 85-16 sixteen-track 1-inch tape machine, with integral dbx noise reduction, and AQ85 autolocator
- Studer B67 stereo mastering machine
- Technics RS-1500US stereo tape machine
- Aiwa Model 800 cassette deck

Effects Units:
- URSA Major Space Station
- Two Lexicon PCM41 digital delay lines
- MXR Pitch Transposer with display module
- Two dbx Model 161 limiters
- UREI LN1176 limiter
- dbx Model 155 noise reduction unit
- Eventide H949 Harmonizer
- Omnicraft GT4 noise gates
- Orban Model 526 De-esser, 622B and 672A Parametric Equalizers
- Studio Technologies Ecoplate II reverb

Monitoring:
- Two JBL 4301's
- Two Calibration Standard Instruments MDM-4 "Near Field" units
- Pair of Auratone 5C Sound Cubes
- Yamaha P2050 and Hafler 500 power amplifiers

Microphones:
- Neumann U87, U89, U47, and SM69
- AKG C414EB/P48, C505E-11, D100E, and C12A
- Two Crown 6LPG and one 3LV PZM's
- Two Sony ECM-50PS and one ECM-33F
- Sennheiser MD-421U

THE FORMAT FUSION
Tascam 16-track/3M Digital

relationship soon developed.

When Hedden arrived Sperry's studio was an 8-track operation. "Steve was doing demos, engineering, singing, playing guitar and everything all himself . . . at the same time yet!" Gary remembers. It wasn't long before a decision was made to move up. As Sperry explains, "One of the problems that we ran into constantly with 8-track was that with me being a real vocally-oriented person — I like vocal harmonies — we never had enough tracks. By the time we put down any kind of rhythm section — three to six tracks — there wasn't much left for the vocals. When I was doing it all myself, and because you can't play piano, guitar and drums at the same time, you do it one track at a time. So you don't have the option of mixing the rhythm section to, say, two tracks, when *you're* the rhythm section. We'd take those six tracks of rhythm and ping-pong them to open up tracks for the vocals. If for no other reason, moving up from 8-track would at least make things easier."

A little over a year ago the conversion began, and the challenges were there from day one. "The whole engineering end of it was interesting," Hedden recalls. "The very thought of trying to find ground when you're 450 feet in the air is a good example. I had an excellent technician, Marty Sargent, working with me, and we got the job done."

The Decision To Go 16-Track

For a number of reasons, Steve Sperry decided to move up to 16-track, not 24-track. Space was a consideration, but the biggest reason was *budget*. He selected the Tascam 85-16 (one-inch, 16-track). Sperry adds, "What we then did was surround ourselves with all of the trappings of 24-track, in that we have the same kind of reverb, a collection of exotic mikes, Harmonizers, digital delays, outboard EQ, compressors, noise gates . . . in other words, we have everything *except* the 24-track machine. What we have proven here is that we can produce very competitive sound — we have several 'finals' on the air right now that were recorded in The Mult Shop.

"It's funny; every time a new engineer comes in to work at the studio, there's always that smirk. After all, we're in the bedroom of an apartment! It's kind of, 'OK, I'll work in your cute little studio.' By the time they finish and walk out it's, 'I wish we had this board. This is really great . . . I love it up here.' There's a nice atmosphere, a relaxed atmosphere that people really enjoy."

"I should point out," Hedden quickly added, "strictly on a technical level, one of the tremendous breakthroughs in production up here was the addition of the digital drum computer — the Linn

STEVE SPERRY

LM-1. We're able to utilize it with only one track of the 16 involved in the drum sounds. During a mix we have all of the 'voices' of the drum computer available to us in a sense live — each can be tuned and equalized independently. So, essentially, we have a dozen live drum voices, and 15 tracks still available to us! In most cases this gives us more flexibility than we'd have with a 24-track and a [human] drummer.

"Typically, in a conventional studio, we'd use four channels for drums, probably another two for percussion, and one more to put a click down. So we've used seven of the 24 available tracks just for percussion. With our system, the one track is merely a synchronizing signal between the drum computer and the tape machine; it's just a control signal. For the sessions we do here it's really great!

"The third piece of equipment that makes all of this possible is the Soundcraft 1624 mixing console. Normally with 16 tracks we would only have about 20 inputs. The Soundcraft is a high-tech version of an old-fashioned split design console, which is real comfortable for me. It's really two boards in one package: the record side and the monitor side, they're both there. In mixdown you tie the two together essentially, so you have full width of the board. In this setup it gives us 48 inputs — 40 have EQ, and the full complement of six auxiliary cue sends — it's a big console when it comes to mixing. We've ended up with a lot of capability.

"When you add the peripheral equipment we have assembled here — the rack of what I call 'toys' — we're probably more complete than many of the 24-

GARY HEDDEN

track studios."

"For the amount of money we would have spent on a 24-track machine alone," Sperry emphasized, "we have an awful lot of technology working for us. This has really been much more beneficial. We'll eventually install a 24-track. I always smile at the thought of eight more tracks. But this will happen because the 85-16 allowed us to make the transition, at no sacrifice to quality. The 85 16 is a great option to the person who, because of budget limitations, feels it's 24-track or nothing. This machine has given us the opportunity to optimize the dollars that are available to us in this difficult economy."

The Recording Project — "Indiana Jones"

I could probably end this article right here, and feel that I had made my point. But something remains unexplained, the article's title: "An Unlikely Marriage Produces Remarkable Offspring." Now you're going to hear about *real* innovation. Simply stated, and with what you have read to this point as background, Steve Sperry and Gary Hedden have coproduced what might end up being one of the biggest hits of recent recollection. It's a record based on the popular hero of the blockbuster motion picture, *Raiders of the Lost Ark*, fittingly titled, "Indiana Jones."

The evolution of this record, in my opinion at least, is fascinating. It's a story probably best told by Steve Sperry:

"Last summer, when *Raiders* was first released, John Galobich, who was my rep at the time, said, 'What this world needs is another Davy Crockett; an American hero celebrated in song.' He came up with the idea that the character from this movie would be terrific. Neal Selman, who is a copy writer at Leo Burnett, and a good friend, came up with some lyrics. I got intrigued with the idea and wrote some more lyrics, and wrote a tune. Barry Fasman was in town to do another project with me. [Sperry and Fasman have written a number of tunes for the NBC-TV show *Fame*.] The two of us reworked the chorus. So there are four of us who co-wrote 'Indiana Jones' — John Galobich, Neal Selman, Barry Fasman and myself.

"Gary, Foz [Fasman] and I did the demo here in a marathon weekend session. On the demo it was just Foz and myself, playing and singing all of the parts. We did it on the 16-track, one-inch with the Linn Drum Computer in sync. We knew we had written a hot tune, so the energy and enthusiasm really carried us. In fact, this thing has been a magic project every step of the way."

Gary Hedden had to jump in with a comment: "What's so neat about the setup here at the studio is that I don't end up being stuck at the board. Steve can run it, and Foz can run it. That way we could rotate so one of us could come out to the living room for a little break, enjoy the skyline, have a soda pop, and go back in refreshed and ready for a few

Pictured with the Tascam 85-16—Murray R. Allen, president of Universal Recording Corp., Leo Graham, producer, whose credits include Grammy award-winning act The Manhattans.

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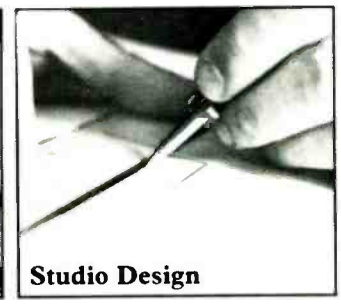

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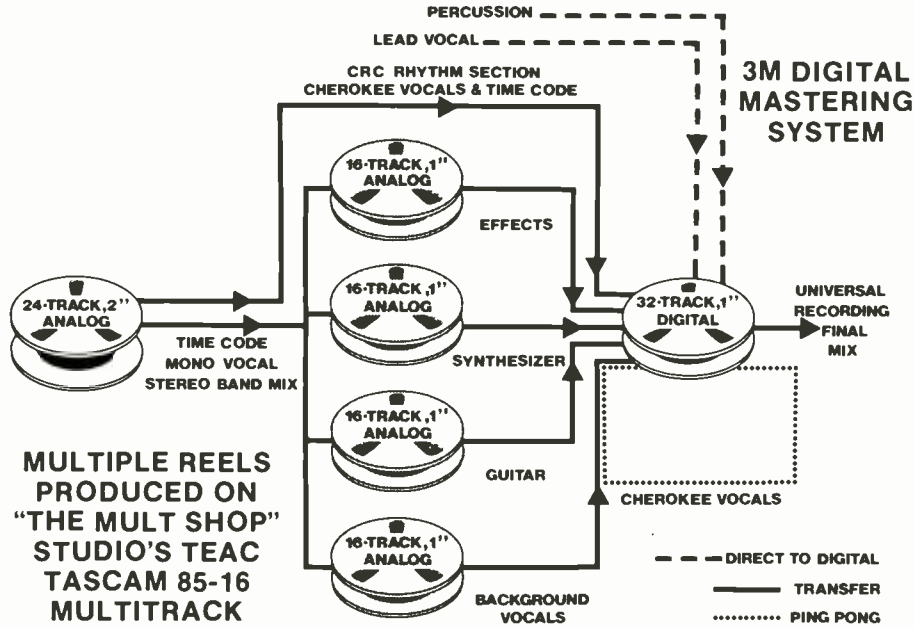


MULTIPLE REELS PRODUCED ON "THE MULT SHOP" STUDIO'S TEAC TASCAM 85-16 MULTITRACK

more hours of work. It gave me a great chance to save my ears for the mix."

"We got it together and it was a great demo," Sperry continued. "Next we thought it might be a good idea to send it off to George Lucas [whose company, Lucasfilm, Ltd., produced *Raiders of The Lost Ark*]. To our glee, we were told that George Lucas and Steven Spielberg were both very enthusiastic about it, and that they supported and encouraged our promotion of the tune. Once we had their blessings we were ready to go forward with the production of the record.

"We were waiting for Foz to come back to Chicago. He was inundated with projects for *Fame*, Johnny Mathis, and other commitments, and just couldn't get away from California. I wanted to get away, but I didn't want to do the whole thing out there. Plus, I wanted Gary to be involved.

"We called Alan Kubika at CRC — Chicago Recording Company — and he said the studio was available. We went right in and did the basic rhythm tracks, this time on 24-track analog. We had an incredible amount of fear that we couldn't top that 'magic' demo. And every time we told someone we were going to go in and do it for real, we'd get the same reaction — 'What are you talking about? The demo's terrific. What would you do differently?' Quite frankly, we felt we wanted a little brighter tempo, and I think we were right.

"What's interesting is that the final [mix] is really quite different. It has its own existence, apart from the demo. They're really two rather different birds, and that scared us even more. Fear aside, we proceeded to the next step. Gary and I flew out to LA with the 24-track master. We went to Cherokee Recording, where Foz and I did the vocals."

"We really felt like we were on the way," Hedden counters, "and then we looked at the number of tracks we had left. We started thinking about all of the neat effects we had done on the demo, and we began to feel a little ill. I had really stretched out with the things we could do. Like we put a miniature guitar amp in the bath-tub, and recorded it with a [Crown] PZM; did 12 tracks of that and sub-mixed it down to two. That kind of stuff was on the demo.

"So here we are, flying back to Chicago with three open tracks left on the 24-track master. We were actually walking around in the airplane saying, 'What can we do?' Then the thought kind of hit us both at the same time — with all of the fancy synchronizing gear around, why don't we make a dub of the rhythm section on to a piece of 16-track, one-inch tape — just a monitor mix, so we know where we are in the song, and transfer a timecode along with it. We could then bring the tape back to the Mult Shop, and do some of the layers of interesting sounds that we had on the demo. This was possible because Murray Allen at Universal Recording [in Chicago] had both a 24-track and a Tascam 85-16, plus all of the synchronizing gear and the tie lines to interface the two formats."

Turning to Digital

"We figured, as long as we were going to do that," Hedden continued, "we might as well run several copies of it. In other words, a number of slave reels. Then we got to thinking that we could eventually mix these slave reels on to a two-inch slave reel, so we'd end up with the original rhythm on one piece of two-inch, and all of the slaves on another. And then we got to thinking . . . they've got a 3M 32-track digital machine at Universal. Maybe we could bounce the 24 and 16 on to one format, and mix from that. So rather than go the conventional route of two 24's running in sync, we performed the rather unlikely marriage of 24-to-16-to-32 digital.

"We came back to the Mult Shop with our six slave reels. Each of those slave reels provided us with an additional 12 tracks. We now had a potential of 72 open tracks from our 16-track, one-inch machine! That was helpful. So we could fill 12 tracks with goodies, put on a fresh tape, and start all over again. The hard part was remembering what was on all of the tracks, and imagining what it would sound like together.

"We ended up with a reel of background vocal parts; a reel of guitar parts; a reel of synthesizer parts; and a reel of miscellaneous effects. We only used four of the six slave reels, but that gave us 48 tracks of new material, on 16-track, one-inch format that could be slaved to the 24-track master. And we didn't skimp on the rough slave mix. The four tracks we transferred consisted of a stereo band mix; a mono vocal on a separate track so we could listen to voices if we wanted; and a timecode track. The timecode was recorded low-level, and didn't require a guard track. And we still had 12 tracks left on each tape.

"With the dbx system, noise wasn't a problem. Everybody says, 'You've got all these tracks up and the noise accumulates.' And I say, 'But you have all those *signals*, too.' At certain points in the mix you want to be able to turn things off if they are noisy. You end up being creative in the mixdown, if you need to. But I never found the tape hiss to be a hassle. It's all 'aggressive' music. I always fade-up and fade-out while I'm recording, so the tracks are clean as I put them down. I'm riding gain as much as possible. The transition from 'no-signal' to 'some-signal' is smooth; the no-signal is *really* no-signal."

Pre-Mix and Mixdown Sessions

"Bringing this all together was interesting," Hedden concedes. "First we dubbed the original rhythm section on to the master 32-track digital. Next we brought up the first slave reel and submixed, or mixed together, the 12 program channels into a stereo panorama, utilizing just two of the 32 tracks. We did the same process with each of the slave reels. In one of the cases — background vocals to be specific — while we were mixing the 16-track, one-inch material we combined some of the original material that had come from the Cherokee session, and which was presently residing on the 32-track. We mixed that with the material from the Mult Shop into the submix, thus freeing up a couple of channels on the 32-track. We were doing a mixture of ping-ponging and transfer at the same time. In my mind, from the very beginning, all of these slave reels were to be layers of sound, filling in voids. We really ended up with a multiple-layer feel."

Steve Sperry brings the chronology to a conclusion: "Once everything was assembled, we added some live percussion, directly to the 32-track. We wanted

to get ultimate quality on the percussion in the big room. And just prior to final mix, we decided to redo the lead vocal, direct to digital. We really had the tape packed. Thank goodness for automation! Universal has a Neve/NECAM [automation] system, which they had adapted, through their own interface box, to the 32-track digital. It's just downright slick! At that point Gary almost missed getting blisters on the ends of his fingers, because everything was handled for him by the NECAM."

So there you have it. "Indiana Jones," an exciting new folk hero, is captured in a tightly and beautifully produced new record. And, as Steve Sperry put it, "There's not a yawn on the entire record." At this writing there are five major labels showing strong interest in the record. It's a safe bet that many *R-e/p* readers will be hearing "Indiana Jones" on their local radio station fairly soon.

A Synergy of Formats

I think you'll have to agree with me, this has been a story of innovation and courage. Steve Sperry and Gary Hedden really went out on a limb to try something new, and it worked. In the past, it would have been impossible; the alternative formats were marginal. But what has happened is that technology has allowed the manufacturers to build these formats today with specifications that rival the traditional equipment. And that's the key. Steve and Gary simply took advantage of today's technology.

As Murray Allen, president of Universal Recording, put it, "It's hard to get people to change. Technology is way ahead of what people are using today. Our studio, we feel, is probably about five years ahead of our clients' present demands. We have a couple of clients, like Steve Sperry and Gary Hedden, who stay right with us. For example, we've been locking machines together for years. This was the first time we locked 16-track, one-inch analog to 32-track digital. We were able to prove that the systems are compatible, because two guys had some imagination and nerve."

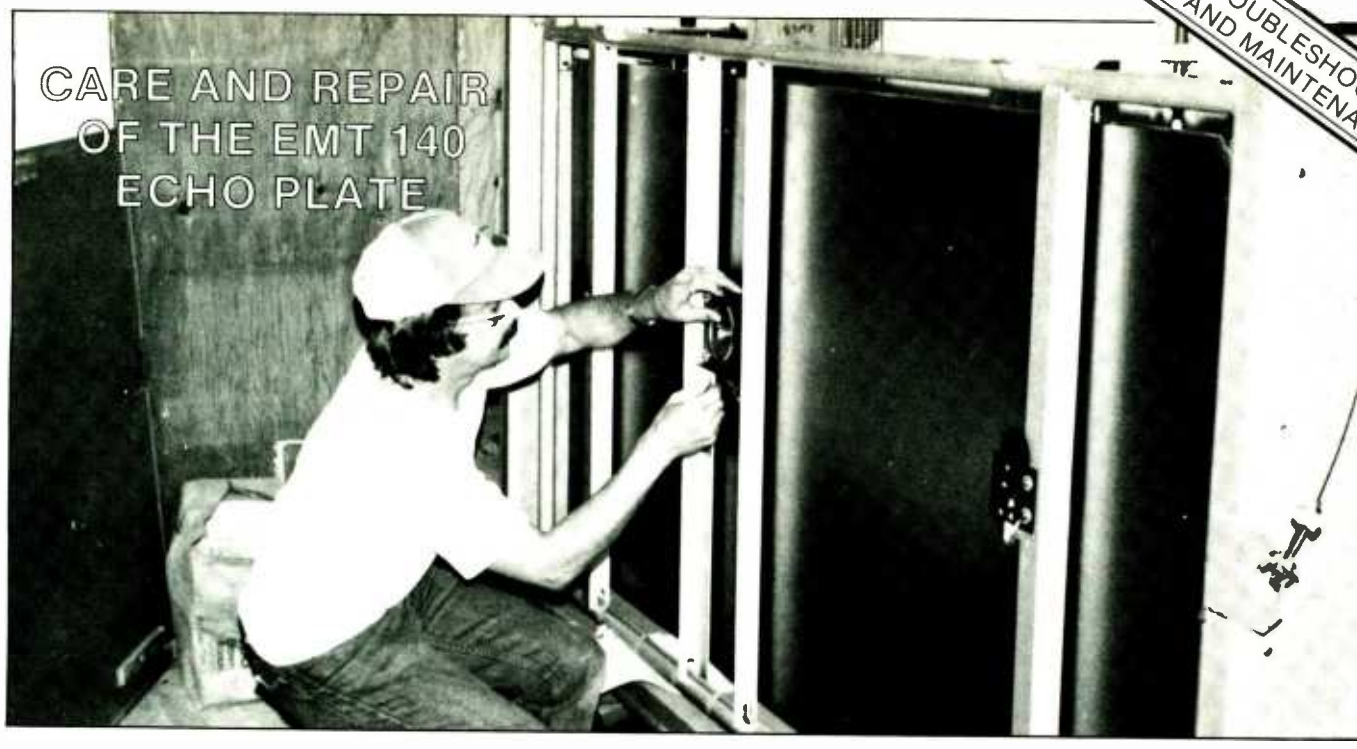
Alan Kubika, president of Chicago Recording Company, added, "We've been fortunate in the Midwest. Unlike the East and West coasts, the recession has had less of an effect on us. We have always had a steady flow of stable recording business; much of this because of commercial activity — we're right behind New York, and way ahead of Los Angeles. Many people don't realize this. As a result, we can afford to experiment a little."

When Alan Kubika made this comment to me, I couldn't help but think of the irony — money problems preventing experimentation that could result in money problem solutions! The time has never been better to look to viable options. High-tech, low-cost gear — like the Tascam 85-16 — just might be the way to go. As Kubika puts it, "The stifling factor in today's recording business is the cost of equipment. It has exploded in recent years by more than a factor of 10. The real inequity is that the costs of studio time have only increased by about three to four times in the same period." High-tech, low-cost begins to make even *more* sense.

Murray Allen explained why he had purchased the 85-16: "I thought it would be fun to have one . . . the price was certainly right. The way I looked at it, with our work in advertising, and with cable moving in, these people will all be looking for good quality [audio] for a smaller budget. Like Steve and Gary, you can always move to digital for the finish. It's simply better use of the equipment. A wise person knows the best usage of equipment. The 85-16 was the expeditious selection for 'Indiana Jones.' The way Steve and Gary used it was very smart."

I guess this article has really been about a couple of successful marriages, not just one. The first involved the Tascam 85-16 recorder/reproducer, the Soundcraft 1624 console, and the Linn LM-1 Drum Computer. The second marriage coupled 24-track, two-inch and 16-track, one-inch analog to 32-track digital, with the Neve NECAM assisting in the mix. Whether the marriage was monogamous or not is academic. The point is that "Indiana Jones" is a remarkable offspring. Kind of makes me wonder how many more innovators there are out there . . . ? ■■■

CARE AND REPAIR OF THE EMT 140 ECHO PLATE



Studio 55's Carter Wallace adjusting its EMT 140 plate

by Greg Hanks

Haven't you been there? The lead vocalist asks if you can give him a more "orange" echo in his cans. You kind of know what he means, and turn for another 2 dB at 1 kHz, only to discover that whatever you do, the echo is somehow *off*. The EMT 140 echo plate has appeared on more hits than you have years, but yours doesn't seem to sound like "them." Maybe it's time for a tune up.

The EMT 140 Reverberation Plate is found in studios the world over. Its popularity is evidenced in part by the introduction of the Studio Technologies Ecoplate, and the Audicon Plate, both of which work on the same basic principles. (These brands were introduced as soon as the various EMT patents expired.) There are a number of variations on the 140 — 140 Mono, Tube, 140ST Stereo Tube, 140 Stereo, Solid State, Q, Quad Return Solid State, all with or without servo remote, etc. — but, for the time being, the following considerations applies to them all.

Principle of Operation

Let's look at what the EMT manual has to say (sections below in quotes), and try to see what it means:

> "The EMT 140 reverberation unit utilizes the physical properties of metal to achieve its effect. It is a fact that a steel sheet which has been excited by an impulse, setting up within it bending oscillations, will deliver reflections which increase in density with time. Reflections in a three-dimensional room, on the other hand, become more dense as a function of the square of the time. The human ear is unable to recognize the difference between these two operating modes . . .
>
> "The main component of the reverberation plate is a steel plate which is suspended in a tubular frame. Parallel to this plate, another panel made of porous material is suspended in such a way as to permit it to be swung towards or away from the steel plate with an extreme distance ratio of about 30:1. The choice of plate material requires great care, and takes into consideration its internal damping characteristics and the resulting reverberation time . . . "
>
> "Through the use of appropriate steel and critically chosen dimensions, it is possible to produce a plate which possesses an adequate number of self resonances. The length and frequency response of the decay time produce the reverberation effect . . . "

These quotes have been taken out of sequence and are incomplete, but they basically sum up the heart of the EMT.

In order to obtain optimum results from an EMT 140 echo plate it must be set up properly. To adjust one of these devices it is necessary to have an understanding of what mechanisms are at work, and how to optimize them individually. To this end this article will examine the basic operation of an echo plate, outline the various adjustments, and explain the subtleties of the mechanical adjustments and their interactions.

Borrowing from the owner's manual a moment:

> "The steel plate's losses are additively formed by the non-frequency dependent and frequency dependent parts, which are caused by the heat conductivity losses of the bending modes . . . "

This roughly translates to: The losses of the plate can be attributed to friction (within the plate's molecular structure); such losses are termed "damping." For high frequencies, the non-frequency dependent terms are predominant, and for mid and low frequencies, the damping is frequency dependent.

> "Damping through heat conductivity is through practically the entire audible range, directly proportional to the frequency, and inversely proportional to the plate thickness. . . "

These losses occur through bending friction; the higher the frequency the more damping, and the thicker the plate the less damping.

> "The plate used must not only be completely undamped, but must also be extremely flat . . . "

The low-frequency response of the reverberation unit is a function of the decay time.

The term "Echo Plate" is really a misnomer, since echo is a distinct repetition of the original (direct) sound with given time delay(s). Reverberation, on the other hand, is a series of rapid repetitions of the original sound which, if of sufficient density of repetition, form a smoothly decaying sound devoid of distinct echo.

Reverberation density — how many reflections occur per unit time — is determined by a number of factors, the first of which is decay time. The greater the density of reflections, the less echo slap is perceived, and the better the reverb sounds. Where there are density discontinuities in time, these frequencies

. . . *continued overleaf* —

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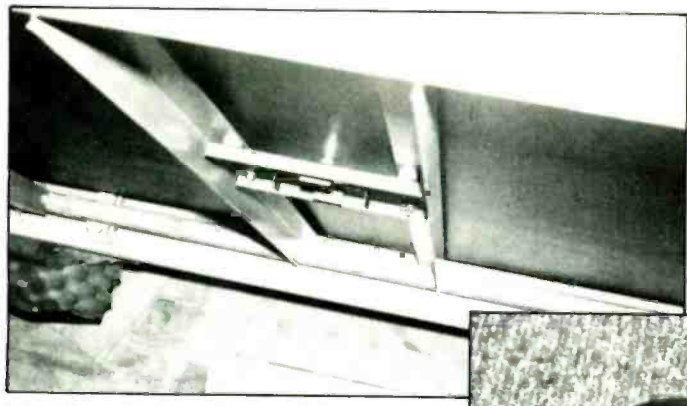
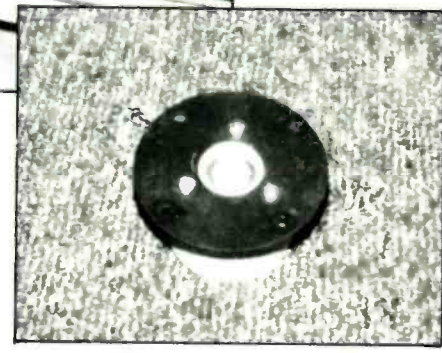
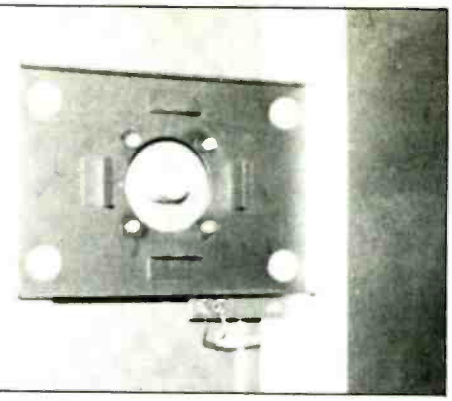


Top View of drive coil assembly, showing mounting for drive magnet and packing washers.



Drive magnet removed from mounting plate.



Front view of drive coil assembly with the magnet removed.

exhibit decay time anomolies, which create what is known as echo flutter. To minimize this echo flutter effect, the signals obtained from the contact microphones are entirely incoherent in terms of the physical mounting relationships of the driver and pick-up assemblies. The mountings are not spaced an equal integer of the plate's horizontal or vertical dimensions as given by the manufacturer's mounting method. If the damping is equal across the surface of the plate for short decay times, and if the suspension is such that the tension of the plate is equalized from the four corners to the center of the plate, then with an impulse-type input the reflections perceived are statistically distributed. In other words, the reflections will be random in relation to one another, rather than being equidistant in time, resulting in "echo." Thus the reflections smoothly increase with time, and a good-sounding echo results.

There are a number of things that affect the smooth reflection packing density of the plate, and these are as follows:

A. The plate density/uniformity. If a plate has rust or oil on it, then in these affected areas the damping is greater, and this unequal damping can produce echo flutter.

B. Tension differences in the plate suspension cause area tension differentials, which in turn will cause low-frequency time intervals, resulting in "roll-around," or low-frequency echo flutter.

C. Centering of the plate in the mounting which, given the mounting method, can cause uneven tension distribution throughout the plate, with equal torque on each mounting bolt.

D. To a small extent, magnetization of the place around the driver, resulting in even-order harmonic distortion, and a lowering of overall driver efficiency.

E. The uniformity of damping across the plate, which on short delay settings can affect how much one area of the plate is damped, without equally affecting the other parts of the plate in the same manner. The result will be a minute degree of unevenness in damping across the plate, resulting in coloration of the reverb by small degrees of low-frequency echo flutter.

Plate Tensioning

The plate is non-reverberantly suspended in a rigid, tubular frame. Suspension and decoupling are provided by springs and clips mounted perpendicularly to the plate edge at all four corners. These clips and springs are under tension and, because of their location, provide tension to the plate as a vectorial product. In other words, the tension is equal to the algebraic sum of the individual tensions, and centered along a line that is tangential to their application (Figure 1). If these tensions are all equal, then the tension at all points on the plate will be uniform, falling to a minimum at the plate center. This implies circumferential dispersion of the wave emanating from the driven point, which in turn means that the major natural resonance is the product of the direct dimensions of the plate, and not an integer thereof, thereby reducing

the equidistant, or time-repetitive reflections, or echo flutter.

The problem with this mounting technique is that the springs are tensioned beyond their elastic limit, and that the tension provided by the stretched spring is not necessarily stable. To my knowledge, all EMT plates (with the exception of s/n 100, located at Nola Recordings, New York City, and probably dating from the early Fifties) are equipped with two holes per spring position. Utilizing both of these holes, I double clip each corner so that each spring can operate in its stable elastic region. This maintains the same tensions as a stretched spring, but ensures long term stability.

The drive signal is electromagnetically coupled to the plate by means of a rigidly mounted voice coil. The voice coil is positioned in a magnetic gap, with the magnet attached to a mounting plate, which is supported by the rigid tubular frame by means of two vertical pieces of angle iron. In order to most efficiently couple the drive signal to the plate, this coil should be positioned:

A. Perpendicular to the plate, so as to impart maximum energy to the plate.
B. Radially centered in the gap.
C. Axially centered in the gap.

I have found the axial centering to be the most common misalignment with an EMT plate (Figure 2A and 2B). Axial miscentering of the coil in the gap is probably done at the factory to allow for more freedom of movement of the plate without bottoming (and damaging) the voice coil in transit.

The pick-up assembly is a piezoelectric accelerometer, whose output is nearly inversely proportional to frequency. The most important consideration when dealing with this apparatus is that they are positioned perpendicular to the plate, and that the leads have sufficient clearance to prevent any additional damping to the plate.

Tuning and Mechanical Refurbishment

The following is dedicated to the hardy soul who wishes to exercise great care, is willing to dedicate 6 to 12 hours and wants to indulge in frustration. (I broke the drive coil during my first EMT plate tuning.)

1. Dis-assemble the unit, removing all side bolts and end bolts on the end panel without electronics. Remove damper plate by removing the two top bars that retain the main vertical support bars, carefully lifting out by the same vertical bars.
2. Remove the driver magnet, inspecting for any metal chips stuck inside the gap, cleaning with double-sided tape. If necessary, cover with masking tape to prevent further contamination. Remove magnet mounting plate.
3. Inspect and repair damper plate. If repairing an older unit, check the integrity of the small tiles that make up the damper. On newer models, check thick damper for edge damage, trim frayed edges, and glue back any loose fibres. Check flatness of damper assembly.
4. Remove the pick-ups by unscrewing the retaining screws on the damper side of the plate, replacing the screw in the pick-up since these are impossible to replace, and leaving the pick-up in the shield can.
5. Remove the drive coil by unscrewing as above, and tape in place on the phenolic strip.
6. Slacken the eyelet bolts around the plate, and remove all but the top two and bottom end two. Inspect the plate for rust and dents, remove and repair as necessary, on a large flat surface (like a floor).
7. Slightly enlarge all of the eyelet holes so as to accommodate two springs in the hole. (Note: break the sharp edge of the hole on the non-countersunk side, as this operates as a clip shear under high tensions.)
8. Re-install the plate into the frame. I do this by re-clipping the top two, the top-end two, the bottom two, and then the bottom-ends. When initially hanging the plate in

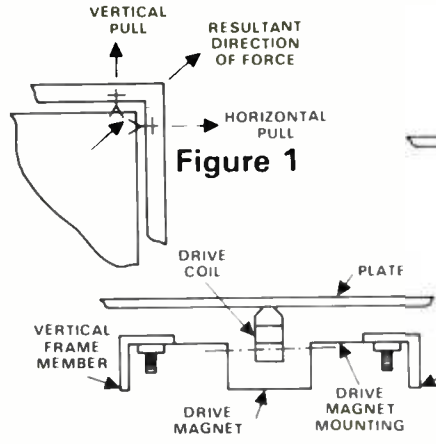


Figure 1

Figure 2

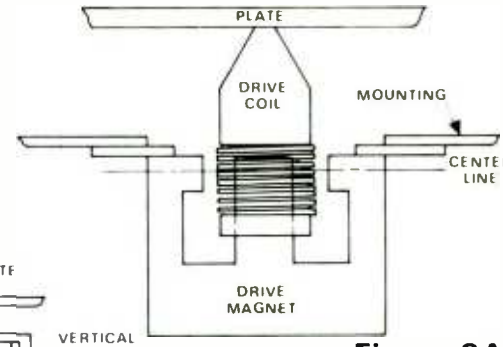
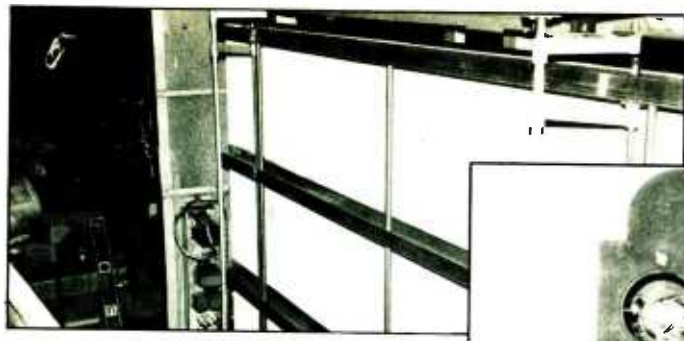
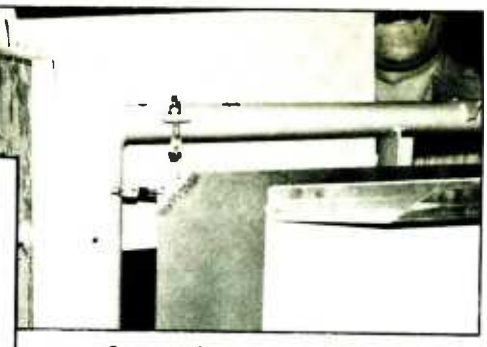


Figure 2A



Damper plate and operating mechanism.

Pickup coils attached to front side of plate.



Suspension springs and clips at corner of plate.

place, it is not necessary to install the clips on the springs, but only to hold the plate in place with the springs alone. When installing the clips on the springs, I use a pair of long-nose pliers, and a pair of 4½-inch Channel-lock ignition pliers, and I install the clips so that I am always applying pressure away from the edge of the plate. The procedure outlined in the EMT owner's manual works well when double clipping, but stresses the springs unduly when only one is used per position.

9. With all corners clipped, the next step is to center the plate within the frame, with a slight offset to allow for tensioning. This means positioning the plate slightly lower than center, and a shade closer to the electronics end.
10. The next step is to tension the plate. I tension the top two and end two eyelets only, on the assumption that if the plate is centered within the frame assembly, the tension applied to the top bolts and end bolts will be, by nature of the symmetry of the plate mounting, the same on the bottom and the other end. To tension the plate, I use a torque wrench supplied by Snap-On Tools, which has a bi-directional range of 30 inch-pounds. When using this method, be sure to apply some light machine oil to the threads of the eyelets, to assure that the thread drag does not skew your readings from actual tension/torque relationships. After initially tensioning the plate to a given torque figure, check the centering of the plate within the frame, and make adjustments as necessary. More on this later.
11. Remount the pick-ups, taking care not to damage the connecting wires, eyeball the perpendicularity, and adjust the shield can to be centered around the pickup. Remount the drive coil, again taking care not to damage or distend the connecting wires. If any stretching of the coiled leads takes place, it can be rectified by rewinding the lead around a #0 Phillips screwdriver shaft. The voice coil should be made perpendicular to the plate using a machinist's square, measuring any two points that are displaced by 90 degrees.
12. Center the drive coil axially on the magnetic gap of the magnet. This step requires some measurements and calculations, because you must measure the distance from the plate to the center of the coil, then measure the distance from the plate to the center of the gap, and make up the difference with the spacer washers removed during disassembly of the driver plate. The spacer count necessary for centering is almost always less than were removed. (I have a bag of extras that you would not believe!)
13. Center the magnet assembly with the Lucite ring that is supplied with the unit for this purpose, as per the instruction manual, avoiding the step that says to make small adjustments by bending it non-perpendicular.
14. Re-assemble the damper plate assembly, making sure that the top and bottom of the damper are the same distance from the plate at all four corners throughout the adjustment range; re-adjust if necessary. Make sure that the damper does not touch the plate at the shortest decay setting.
15. Re-assemble the cabinet and res-

tore the plate to its proper home... *Carefully.*

16. Adjusting the electronics is best done by following the procedure outlined in the manual, then rolling off all the bottom end, and setting the drive level to maximum.

Studio Applications

Receive levels:

Adjust so that the stereo returns are the same level, and the chamber noise is approximately equal to the noise floor.

Drive level:

Adjust to desired subjective effect.

Equalization:

1. To attenuate the highs, EQ the returns.

2. To boost the highs, EQ the send.

3. To attenuate the lows, EQ the send if "rolling waves" of echo are the problem, or EQ the returns if chamber or outside noises are the difficulty.

4. To boost lows, EQ the sends whenever possible, clipping of the chamber being the limiting factor. Keep in mind that the longer the decay setting, the more apparent bottom-end will be in the echo.

Insert all echo delay devices in the send bus, so as to use the high-frequency attenuation of the chamber to mask the additional noise of the delay.

* * *

The prime objective of this article is to impart some of my experiences in obtaining a reverberation device that has a smooth decay characteristic free of echo flutter, and how to use this device with a minimum addition of noise. These objectives may be reached through attention to mechanical detail in set-up, and judiciously avoiding the accentuation of reverb noise in application.

Addendum

In reference to the chosen torque figures for tightening the plate, it is best to make this choice for the particular plate and spring material in question. In order to arrive at a torque figure, tension a single spring/clip combination until you see the elastic limit has been reached. This is the point at which the torque does not go up as you continue tightening, but in fact may even decrease! Such a tension is a good place to put your torque with double clips — it usually works out to be somewhere between 13 and 19 inch-pounds. ■■■

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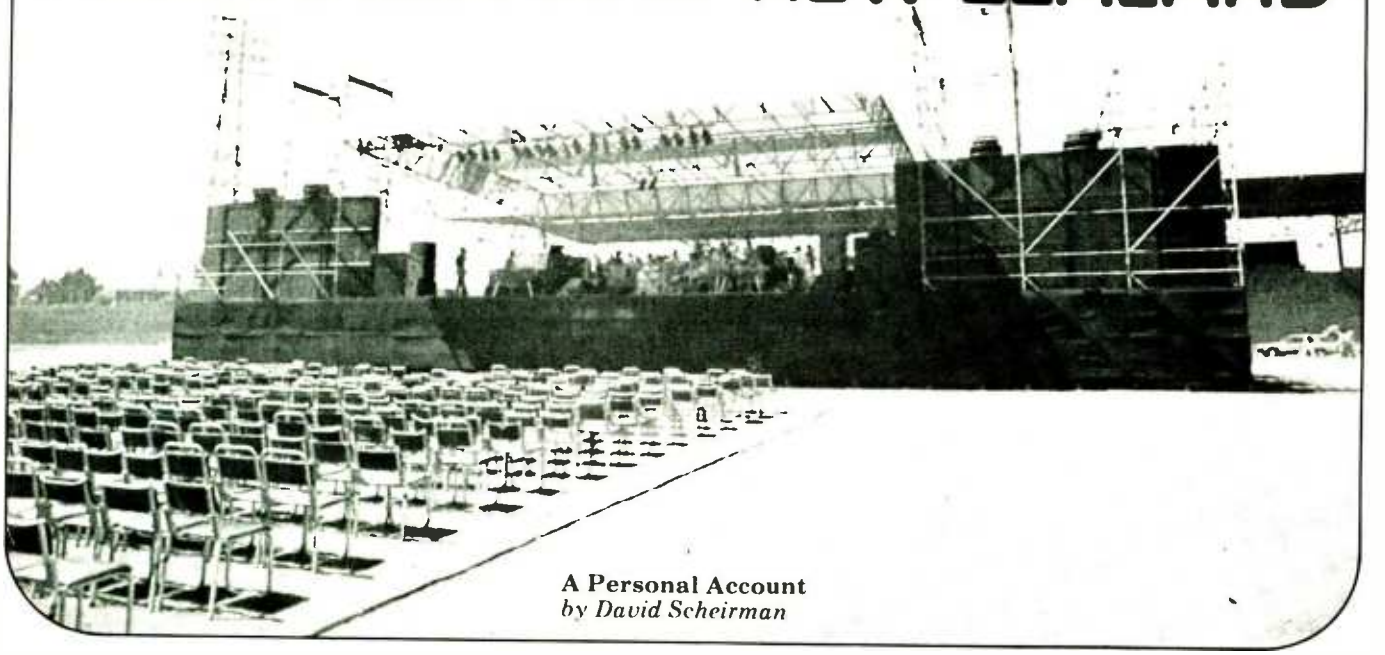
The Right Stuff Down Under —

Concert Sound Design in AUSTRALIA AND NEW ZEALAND



A Personal Account
by David Scheirman

The Jands Modular Sound System for

THE GEORGE BENSON TOUR

Australia and New Zealand. The mere mention of these place-names conjures up visions of kangaroos and kiwi birds; a part of the world that most of us would like to see sometime. However, the thought of taking a full-scale rock concert tour "down under" — over 6,000 miles away from home — should raise an important question in the mind of the audio engineer: just exactly *what* is available in the way of concert-sound systems?

A few short years ago, high-quality audio equipment for concert-sound use was scarce in this far-flung corner of the globe. Touring in the South Pacific was similar to viewing an old combat documentary film: whole planeloads of sound, lighting, and stage gear descending upon foreign soil in fleet formation, at a cost of thousands of dollars in air freight charges. There was a very real risk of seizure by government customs officials; or the ordeal of explaining that, no, there really was no contraband hidden inside that big, empty black W-bin. Fragile electronics racks were subject to damage while in transit, and cancelled shows were a very real possibility due to delays in transportation scheduling. The choice was between flying in the sound equipment yourself, and taking the chance that it would work out in the end, or relying upon the local sound contractor, who often was using a small, inadequate system pieced together from components of World War II vintage, or perhaps something left over from the Olympic Games.

Some of the first adequate sound gear was purchased from American groups on their way through Australia and New Zealand; for instance, a local promoter purchased the entire speaker system used by Kenny Rogers' show after his last date of a tour in the early Seventies. This writer can recall doing an outdoor show in 1976 at a popular island paradise, and requesting more low-end components for the arena system than had been provided. There was a woeful lack of bass response in the system. The local sound contractor immediately dispatched a pickup truck to a nearby plantation, borrowed some 4- by 8-foot sheets of plywood, and dutifully tacked them onto the sides of the folded-horn bass bins, in an effort to make the kick drum audible at the rear of the stadium!

Fortunately, things have changed. As more and more American and English touring concert acts have brought their shows to the Soutern Hemisphere, the increasing market for high-quality sound reproduction systems has brought about a revolution in concert sound technology in countries such as Australia and New Zealand. I recently had the opportunity for some hands-on experience with some of the gear currently in use in these countries. Much of it is designed and manufactured there,

— the author —
David Scheirman is a concert sound consultant and live mixing engineer specializing in international work. He has spent the last 10 years operating nearly every type of available sound system for a wide variety of touring acts.

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rather than having been imported from the United States, or Japan. The sound equipment was provided for a recent tour by jazz guitarist and singer George Benson, and the shows were done with a 30-piece orchestra: a good challenge for concert sound systems anywhere.

Planning the Tour

To millions of fans in nations around the world, George Benson's unique blend of jazz, melody, and fluid guitar lines has become synonymous with the word "quality." When news of a possible trip to Australia and New Zealand first leaked out, the prime concern of Benson's production staff was to re-create in a live situation the quality sound present on his recordings. But without having to transport 10 tons of audio gear from the United States.

In the USA, concert sound system needs for George Benson are taken care of by Maryland Sound Industries, of Baltimore, Maryland. As soon as the dates for the Australian and New Zealand tour were confirmed, MSI engineer Al Tucker began assembling the system he would use by means of telex cables and special-delivery airmail. Specifications of the sound equipment available from local vendors were quite satisfactory, so a decision was made to rely upon a local sound contractor to supply all the necessary hardware. MSI would send only personnel for the tour: Al Tucker handling the house board; and myself taking care of the stage monitor mixes. The Sound Division of Jands Concert Productions was chosen as audio equipment supplier for the George Benson Tour.

Figure 2: Jands "Concord" cabinets mounted together to form a hanging array.

Jands Concert Productions, which has been in business in Sydney, Australia, since 1967, has grown from a small psychedelic lighting rental outfit, into probably the largest total concert production organization in the Pacific region. The company is a reliable supplier of sound systems, lighting equipment, and portable stages. According to owner Eric Robinson, each successive year has been more busy than the last. "This season, we have almost more work than we can handle," he says. "The crews are working almost nonstop, and the gear is out most of the time. We all wonder how long it can last!" Jands has handled the sound for recent tours by The Kinks, Devo, Ultravox, and James Taylor, and was gearing up to provide similar duties for Joan Armatrading the week that George Benson left the country.

Things have also been busy for Australia's other large touring PA company, Artist Concert Tours. Based in Melbourne, ACT is a concert sound specialty company, and devotes all of its

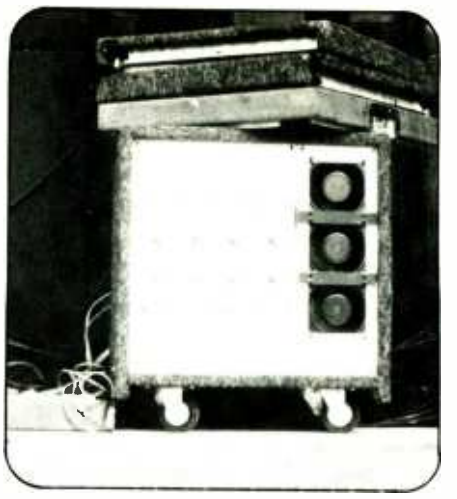


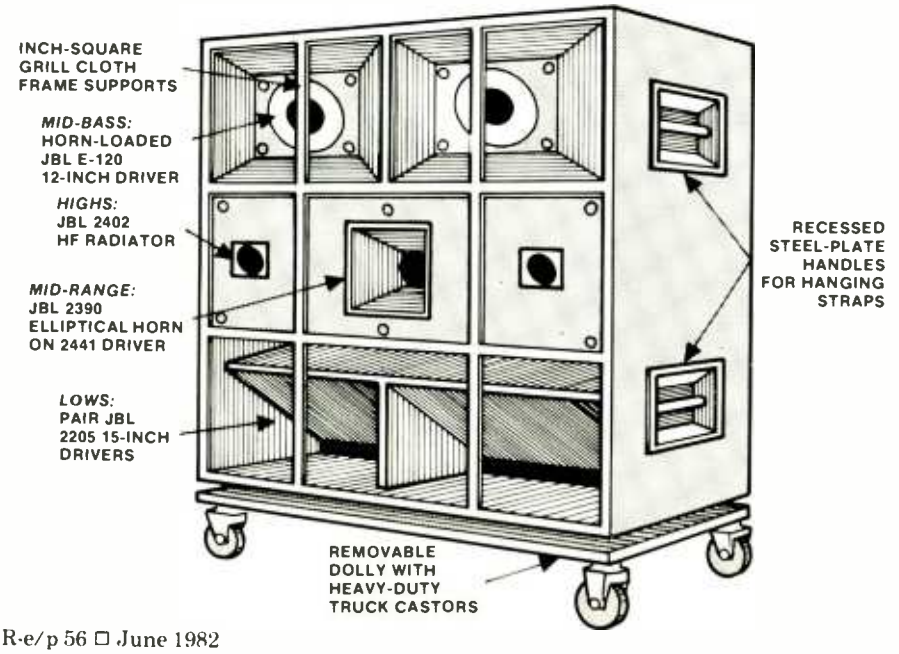
Figure 3: A compact amp rack designed and built by Bob Waddel of Barton Sound, New Zealand.

energies towards maintaining a state-of-the-art inventory of audio systems; the company prefers to stay away from lighting and staging. According to ACT engineer Wyn Milsom, "Our intent is to provide the visiting American or British engineer with a system as good as, or better than, the one he left at home." ACT was handling Elton John's Australian tour the week I was in Sydney with George Benson, and Wyn invited me over to see the gear. It can be reported that the company is accomplishing its goal: the sound system was a very contemporary, well-functioning package featuring Yamaha PM-2000 mixing consoles, and S-4 speaker cabinets.

In the past, ACT has been referred to as "Clair Brothers Australia"; the S-4 speaker cabinets used by ACT were built under a franchise agreement from Clair, and the systems are assembled to meet Clair Brothers' specifications. The company is often used as an extension of the Lititz, Pennsylvania-based company to service clients touring Australia and New Zealand, such as Fleetwood Mac, Yes, and Elton John. ACT's managing director, Ron Blackmore, recently made an interesting proposal which could lead to even greater cooperation between Australian and American Sound companies. In a letter to the editor of the Professional Entertainment Production Society's newsletter, he made note of the fact that Australia's busy touring season coincides with the usually slack winter months here in the United States. The Southern Hemisphere experiences its summer season while North America is celebrating Christmas and New Year. In his letter, Blackmore suggested a "swapping" of concert sound engineers; it seems that at the time when things are busiest in Australia, many US engineers are crying for a tour, and vice versa. January in the sunny Southern Hemisphere, anyone? It sounds fine to me, but who pays for the plane tickets?

— *continued on page 60 . . .*

Figure 1: Jands "Concord" four-way composite speaker cabinet.



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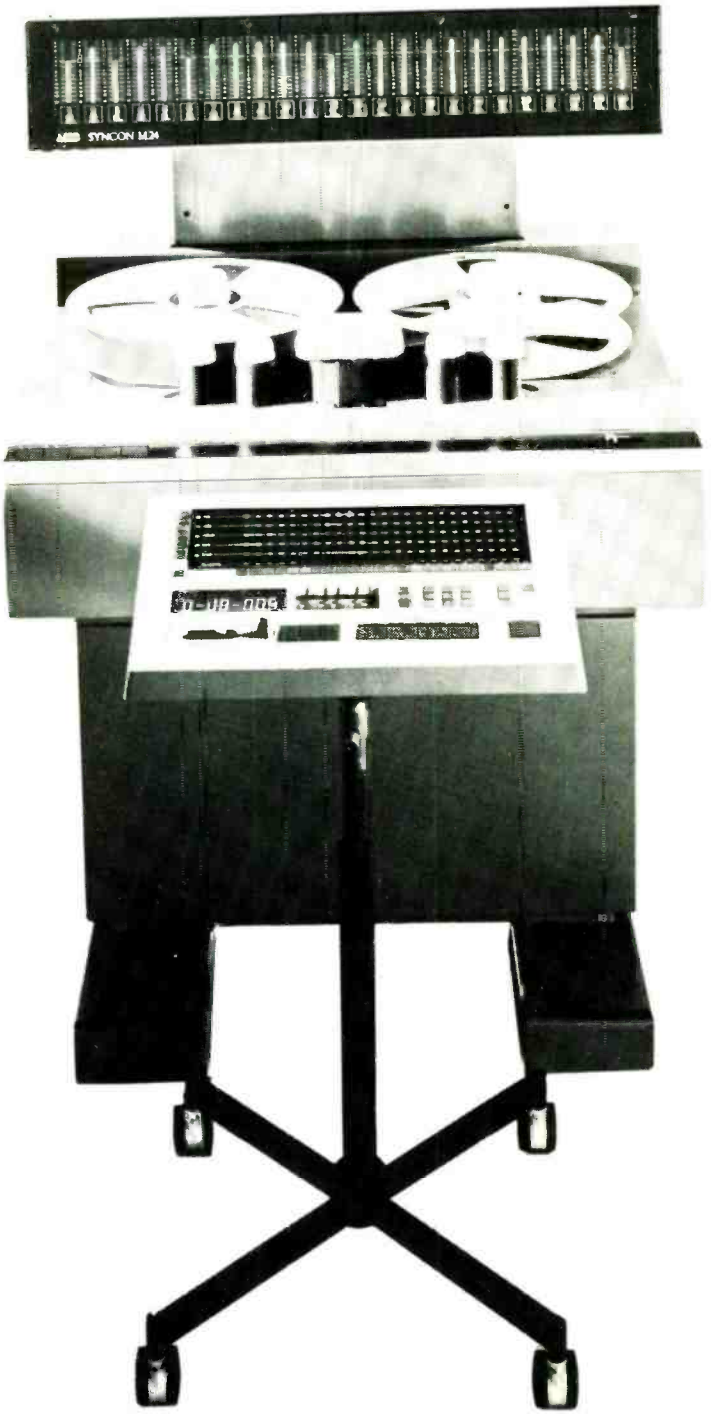

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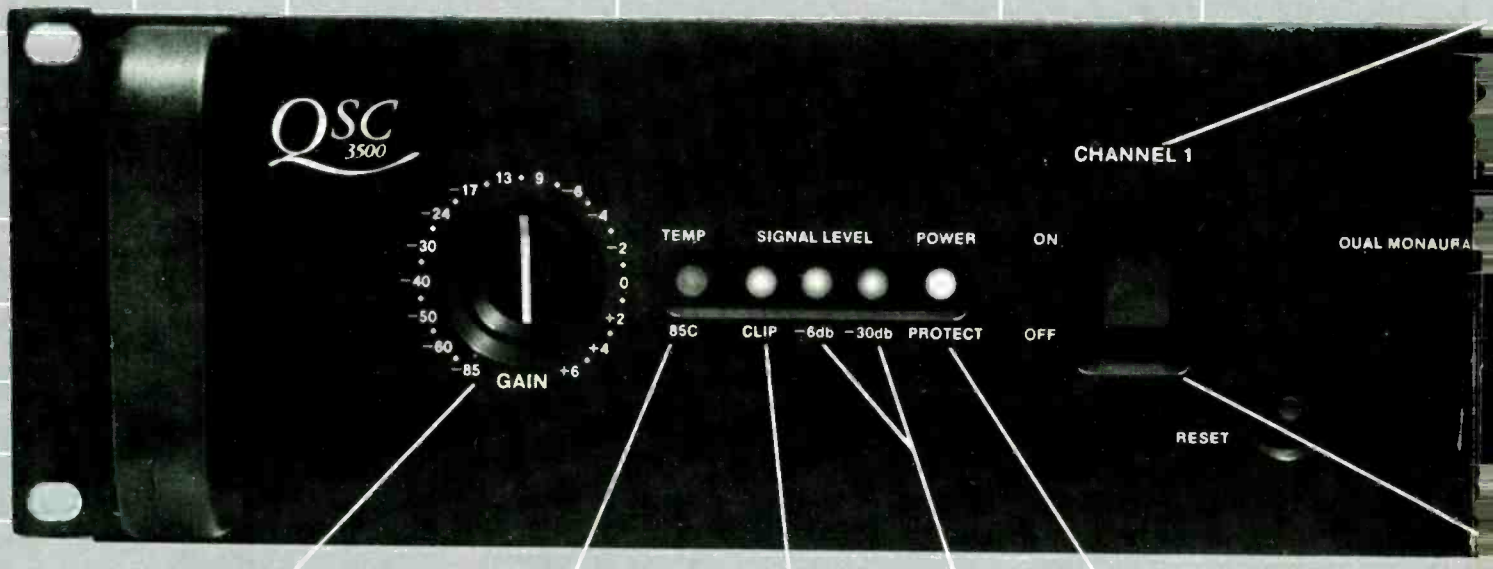

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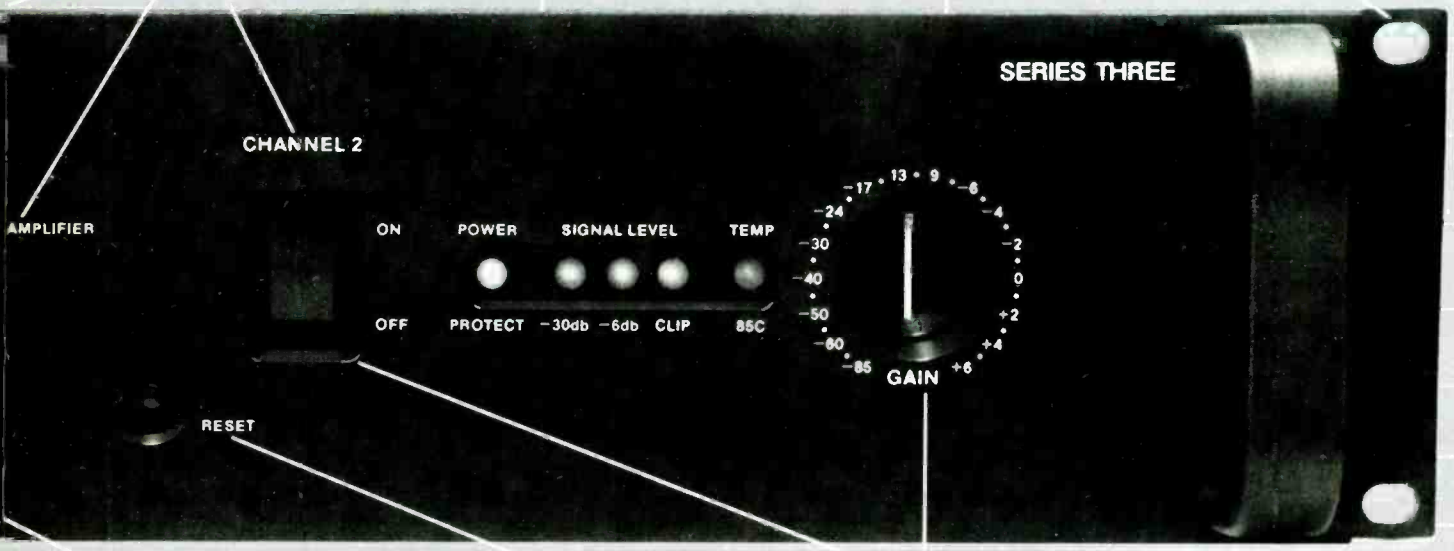

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. . . continued from page 56 —

Sound System Design

The sound system supplied for the George Benson tour was put together by Howard Page, Jands' senior audio engineer, who decided to use the company's modular speaker cabinet, known as the "Concord." Comprising a four-way composite cabinet measuring 6 by 5- by 3-foot deep, each Concord unit weighs 550 pounds (Figure 1). The boxes are designed to be either stacked or hung, and feature built-in high load-bearing capacity metal handles; the cabinets have removable dollies with oversized casters. Jands uses a steel I-beam and chain-motor hoists to "fly" the system from the ceilings of indoor arenas, and the cabinet seems to work well both indoors and out (Figure 2).

"Basically, this tour *had* to use the Concord," Page offers. "The tight scheduling coupled with the wide variety of venues made it a natural choice."

The tour's itinerary, as booked in Australia, was not much different from those encountered here in the US -- venues ranging in size from 2,000-seat theaters, to 25,000-person outdoor sports facilities. For a tour like this, Jands' Howard Page wanted a speaker system that could be set up quickly, transported easily, and, of course, which sounded good. "The Concord fits all these specs," says Page. "And I think it sounds very, very good. I have set up the 12-inch [JBL E-120] cone drivers so that when several cabinets are stacked together vertically, the speakers are evenly spaced, and extremely phase-coherent."

The Concord cabinet houses two JBL 2205 15-inch speakers, two front-loaded JBL E-120 12 inch cones, a JBL 2490 rectangular mid-range, backed with a

TABLE 1. MAIN CONSOLE INPUTS FOR GEORGE BENSON TOUR

Input	Instrument	Microphone
1	Vocal/George Benson	Shure SM-58
2	Vocal	Shure SM-58
3	Vocal	Shure SM-58
4	Vocal (spare)	Shure SM-58
5	Piano Low	Crown PZM
6	Piano High	Crown PZM
7	Piano Low	AKG C451
8	Piano High	AKG C451
9	Keyboard Submix/Stage Right	Jands Active DI
10	Baritone Sax	Sennheiser MD-421
11	Trumpet	Sennheiser MD-409
12	Alto Sax	Sennheiser MD-421
13	Bass Guitar	Jands Active DI
14	Tambourine	Shure SM-57
15	Rhythm Guitar	Shure SM-57
16	Lead Guitar/George Benson	Shure SM-57
17	Keyboard Submix/Stage Left	Jands Active DI
18	String Submix Return/Left	From Auxiliary Mixer
19	String Submix Return/Right	From Auxiliary Mixer
20	Kick Drum	Sennheiser MD-421
21	Snare Drum	Shure SM-57
22	Hi-Hat	AKG C451
23	Mount Toms	Shure SM-57
24	Floor Toms	Shure SM-57
25	Roto-Toms	Shure SM-57
26	Bongos & Congas	Shure SM-58
27	Percussion & Bells	AKG C451
28	Harmonizer Return/Left	DI
29	Harmonizer Return/Right	DI
30	Reverb Return/Left	DI
31	Reverb Return/Right	DI
32	DDL Return	DI

2441 driver, and two JBL 2402 high-frequency units. According to Page, "We are still using JBL as our primary source of speaker components. I've experimented some with Emilar and Renkus-Heinz, and I am waiting to get the new Yamaha 'Super-Tweet' down here. I hear nothing but good reports on it."

For the New Zealand dates at the beginning of the George Benson tour, it was decided to sub-contract the speaker and amplifier systems from Barton Sound of Auckland, New Zealand. This decision did away with the air-freight delays and costs that otherwise could have crippled the production of the first two concerts.

The initial production meeting was held upon our arrival in Auckland, New Zealand. There, MSI's Al Tucker and I confirmed the presence of all the audio gear that had been requested. While Jands engineers Howard Page and Kevin Farrant drew up their finalized line-patching schemes and subsnake-routing charts, Barton Sound engineer Nigel Rowthorn supervised the stacking and placement of the outdoor speaker system.

Barton provided a fairly conventional four-way, component type horn-loaded system; stack upon stack of W-bins; ("Perkins cabinets" JBL 4560 single 15-inch bass reflex box); 90-degree radial mid-range horns; and clusters of JBL

TABLE 2. AUXILIARY CONSOLE INPUTS (ORCHESTRA SUBMIX)

Input	Instrument	Microphone
1	First Violins (pair)	Maruni Electret
2	First Violins (pair)	Maruni Electret
3	First Violins (pair)	Maruni Electret
4	First Violins (pair)	Maruni Electret
5	Second Violins (pair)	Maruni Electret
6	Second Violins (pair)	Maruni Electret
7	Second Violins (pair)	Maruni Electret
8	Violas (pair)	Maruni Electret
9	Violas (pair)	Maruni Electret
10	Violas (pair)	Maruni Electret
11	Cello	AKG C451
12	Cello	AKG C451
13	Cello	AKG C451
14	Cello	AKG C451
15	Cello	AKG C451
16	Cello	AKG C451
17	Bass Viol	Sennheiser MD-441
18	Bass Viol	Sennheiser MD-441
19	Bass Viol	Sennheiser MD-441
20	Bass Viol	Sennheiser MD-441

CONCERT SOUND IN AUSTRALIA AND NEW ZEALAND

2405 high-frequency radiators. The system had to cover a 15,000-capacity outdoor venue in Auckland, known as the Western Springs Reserve. (What we call a park, the New Zealanders call a "reserve.")

The highlight of the Barton sound system was the amplifier section, which consisted of chief design engineer Bob Waddel's new 700-watt per channel modular power units; all the amps are made in New Zealand. Waddel has packaged the amplifiers four to a rack (Figure). The entire 5,600-watt package, containing eight amp sides, measured only 20 by 22 by 24 inches, and weighed approximately 75 pounds. Being so compact, the package is quite well-suited to the frequent air travel required in this region.

When this writer first saw the comparatively small amplifier package, it was assumed that it was only intended for the mids and highs, and that some larger Crown PSA-2's, or perhaps some Phase Linear 700-B's, were on their way. Bob Waddel cheerfully pulled out one of the modular units, and showed me the massive heat sinks. The craftsmanship was excellent, and it was hard to believe that such a lightweight unit could really push the low frequencies. However, Al Tucker and I both became believers when the system was turned on for the first time. As Howard Page slipped his favorite cassette into the deck (the song "Urgent" by Foreigner), the stadium came alive with a tremendously big sound that was hard to attribute to those "little" amp racks. (We kept peeking in empty road cases for the rest of the afternoon, trying to find the hidden "secret" amplifiers . . . of which there really were none.)

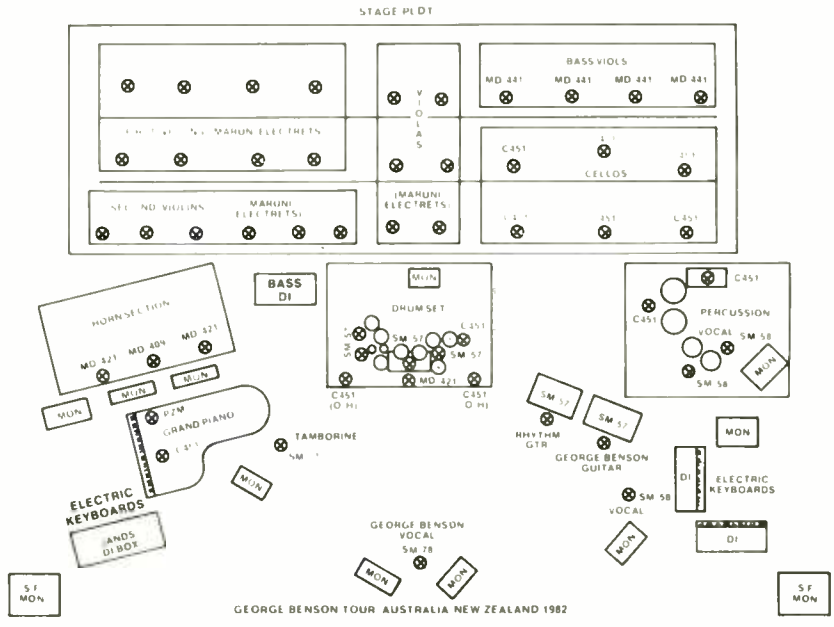


Figure 4: Stage and microphone layout for George Benson Tour.

Stage Miking

This time out George Benson's show consisted of a nine-piece rhythm section and a 30-member orchestral string section, the latter being made up of locally-contracted musicians. Setting up microphones for this many musicians at an outdoor venue during New Zealand's rainy season presented some interesting problems, one of which was rhythm section leakage into the string mikes. At first the leakage, combined with wind noise, was unacceptable. To counteract these negative effects, plexi-glass baffles were installed between the string sections and the band members, and a heavy fabric backdrop hung to protect the musicians from gusts of wind and rain. Steel cables were dropped behind the curtain every few feet to prevent billowing.

The violins and violas were given individual lavalier-type condenser mikes, manufactured by Maruni in Japan. A "class" was conducted at string rehearsal each day by Al Tucker, to make certain that each instrumentalist understood where to install the microphone, and which end to point where. These mikes turned out to be very effective, and quite reliable, except for a unit that was given a cracked exterior housing by a rather large second violinist who sat upon it. (It turned out that she had forgotten to clip it onto her music stand, and damaged it when returning to her chair after string rehearsal.)

The cellos received AKG C-451 condenser mikes, while the bass viol section was picked up with Sennheiser MD-441 microphones (Figure 4). Large foam windscreens were placed over the 441's, and served a dual purpose. Not only did

Figure 5: Jands senior engineer Howard Page (left), and MSI engineer Al Tucher, at the JM-7 32-input house console.

the screens keep out the wind noise, they also made the musicians play with the foam-covered mikes in direct contact with their easily-scratched instruments, thereby helping to achieve the maximum possible acoustic gain.

House Mixing Console and Outboard Effects

House engineer Al Tucker conducted a stereo string mix on an auxiliary Jands JM-7 24-input console, and fed the outputs of that board into the main JM-7 32-input mixer (Figure 5). The string mixes were then routed through an Eventide Harmonizer, and the stereo outputs of that unit utilized to provide a rich, multi-textured orchestral sound. Input assignment's for the main and auxiliary consoles are listed in Tables 1 and 2.

The JM-7 Series of mixing consoles is an Australian product, designed and built by Jands at their new multi-purpose warehouse and shop facility near Sydney International Airport. The console features full parametric equalization, subgrouping, four effects sends, and phantom powering. Each input module offers variable gain attenuation, long-throw 120mm faders, stereo panning, phase-reverse capability, mike/ line switching, and visible LED meter arrays. The board has insertion points on all channels, full monitoring facilities, a talkback module, and four line-level inputs for effects returns. The console worked well for house engineer Al Tucker: "I liked the board . . . it was very easy to operate and understand. And it sounds good, too!"

The JM-7 console is relatively large and heavy, as are most contemporary boards; few manufacturers have figured out how to cut those excess pounds. The weight of the JM-7 is due, in large part, to its sturdy internal metal frame. The board was equipped with neat, flexible gooseneck lamps that are removable for cartage, and was well-thought out in terms of switching placement. Jands produces the console in both 24- and 32-channel versions.

Many of the other electronic components in the system were designed and built by Jands, including the JP-4 parametric equalizer, and JX-5 electronic crossover. The JP-4 is equipped

Figure 6: Author David Scheirman at the Jands RD-3 32/12 monitor console prior to a sound check.

with four widely-overlapping parametric bands. Each band may be broadly or sharply boosted by up to 22 dB, or cut by as much as 40 dB. The filters used are Bi-Quad, second-degree state-variable networks, often referred to as infinite gain networks. The relatively new JX-5 electronic crossover package was well made; an internal "mother board" contains plug-in connectors allow the user to select the proper crossover frequencies for his particular application. The filters used are 18 dB-per-octave Butterworth type.

The company also builds a versatile line of stereo power amplifiers. The J400 provides 200 watts per channel (4-ohm

load); the J700 develops 350 watts per channel; and the new J1000 is rated at 500 watts per side. The Concert Series version, as supplied for the George Benson tour, featured metering, fan speed switching, and additional protective devices.

The main house rack as used by Tucker contained dbx Model 160 compressor-limiters and Klark-Teknik third-octave graphic equalizers. In addition to the Harmonizer, the supplied signal-processing gear included an Eventide Omnipressor, a Lexicon Model 224 digital reverb unit, and a Lexicon Prime-Time DDL. Additional equalization and compression was available for channel inserts, and was used by Tucker for such things as fine tuning the sound of the grand piano, and limiting the bass guitar.

The Eventide Omnipressor is a favorite tool of Tucker's, which he uses to contain the sound of the drum set. The unit's threshold and release functions may be set up to keep the relative overall level of the drums very consistent, while still maintaining a fairly wide dynamic range. The new Lexicon Model 224 digital reverberation unit was a "must-have" device for processing the vocals; it was considered to be much more reliable than spring-type units, and the remote, hand-held control panel is very convenient. The Prime-Time digital delay was used occasionally for effects on George Benson's voice and guitar.

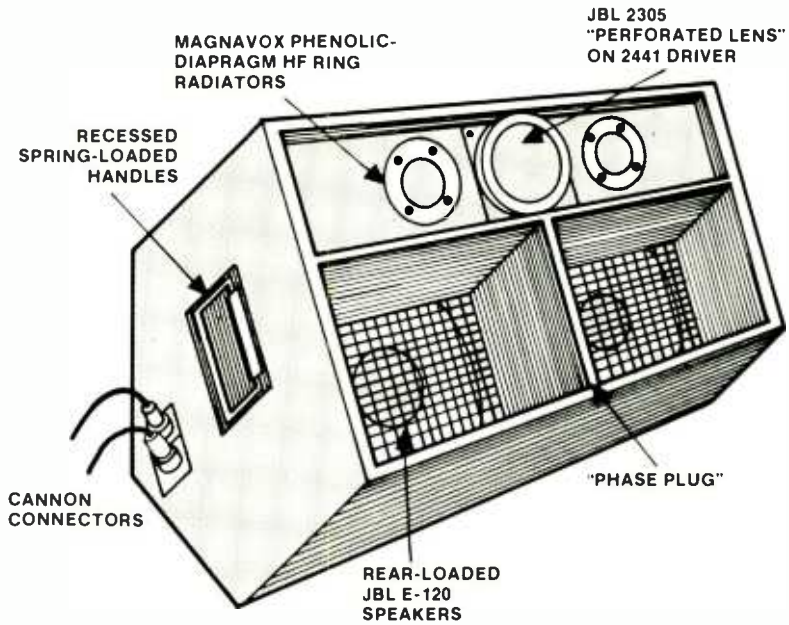


Figure 7: Jands 2-12 three-way floor wedge monitor speakers.

Stage Monitoring

The stage monitor system featured the brand-new Jands RD-3 32-input monitor desk, which offers 12 discrete outputs, LED ladder-type level displays, and all the switching functions a monitor engineer could ask for (Figure 6). I found the console to be very well-made, and was quite pleased with its performance. Very high-quality faders and rotary pots were incorporated in its construction, and all the controls had a very solid feel to them. Each individual "send" pot on every channel had an on-off switch, and a red-green LED indicator — a handy feature. The equalization was three-band parametric type, with a selectable-frequency high-pass filter also available on each channel. The upper one-third of the board contained the EQ and input-attenuation sections, and was mounted on a novel hinged panel, which folded flush with the rest of the board for travel, and could be raised up to one of three positions for concert use. The output section on the right side of the mainframe featured muting switches and on/off LED indicators. Each board output was processed through a third-octave graphic equalizer, compressors also being available.

Stage monitors were divided into 10 different mixes, the last two additional outputs being used as keyboard submixes that were sent out to the house console. Two of the mixes were utilized as stereo sidefill sends for the Jands three-way cabinets, while the remaining eight outputs drove bi-amplified Jands floor slants. The latter were available in four different configurations, one existing for nearly any applications.

For George Benson, I used two of the new Jands 2-12 wedges designed by Howard Page for the recent James Taylor tour. Two 12-inch speakers are phase-aligned in this cabinet with a high-frequency driver (Figure 7). The JBL E-120 12-inch units are horn-loaded with a phase plug between them, and

the JBL 2241 HF driver features a 2305 perforated dispersion lens. The wedge is also fitted with two ring radiators, one on each side of the lens. The box was found to be smooth and natural-sounding, and George Benson agreed: "Sounds good, man. Nice and solid," he told me.

One interesting twist in Benson's mix was a dbx Model 160 compressor-limiter, over which George had personal control (Figure 8). The unit was located on stage beside him, at waist-level, and inserted into his vocal mike input channel on the monitor console only. With this unit in the line, George now had a gain stage that only he could control; he could increase the level of his voice in the monitor speakers, or lower the level instantly should feedback start to occur. One newspaper reviewer, commenting on a concert that took place in a venue possessing a large amount of natural "slapback" delay, assumed that the dbx unit at George's side was some sort of secret black box, and made reference to George "fiddling with his echo unit."

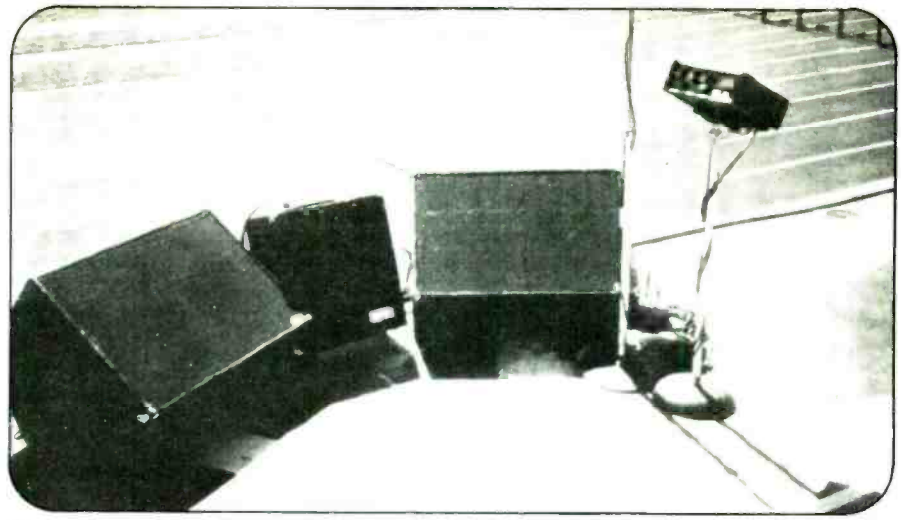


Figure 8: George Benson's on-stage monitors comprised a pair of 2-12 wedges, seen here with his personal dbx Model 160 compressor-limiter mounted on a mike stand for easy access.

Audience Reaction

The morning after the first show, band and crew alike were pleased to pick up a copy of *The New Zealand Herald*, which ran this review on Friday, February 26, 1982:

"13,000 people saw and heard a show given last night by the American guitarist George Benson with his 38-piece orchestra . . . the production was excellent . . . the sound was clear and undistorted."

This was to be the first of several such favorable reviews. The tour went on to do 12 shows in 16 days, and the equipment and personnel traveled more than 5,000 miles. George Benson and company performed in front of over 100,000 people, both indoors and out. Through it all, the Jands concert sound system and engineering crew performed up to our expectations.

Life on the Road

The sound system traveled most of those miles by tractor-trailer truck, or "artic" (Australian slang for "articulated truck," which basically means that it bends in the middle). The diesel trucks were quite similar in size and shape to what we are used to in the USA: brand-new Kenworth tractors, with one very important addition: the "'roo" bar. Upon first hearing a driver use this expression, visions of a reddish vegetable came to mind, until it was pointed

out that a healthy kangaroo weighs in at many hundreds of pounds, and is a constant threat to vehicular traffic on the highways in the "bush." (The 'roo bar consists of a heavy-gauge steel structure rather like a grid-work projecting upwards and outwards from the front bumper of the trucks, and serves a similar purpose to the old cowcatchers on steam locomotives.)

Much of the highway system in Australia is of the two-lane variety and, since most of the major population centers are along the coastline, the roads are filled with curves. What we might think of as being a simple 250-mile drive can very easily take fully twice as long to drive in Australia; say, 10 hours instead of five. We found the Australian crew to be exceptionally worn out because of this; practically every hour of the day was spent either driving, or setting up the sound system.

The Australian technicians informed us that, just like in the US, audiences had become quite sophisticated in their expectations as far as the technical side of the show went; they are used to getting good sound, and do know the difference between good and bad audio. Australian engineers seem to have inherited something more from the English than just their accent: a peculiar affinity for a very thick-sounding low end, bordering on what American engineers might call "muddy." Howard Page commented that he sometimes felt visiting sound engineers were mixing the shows a bit "thin" for the Australian ear.

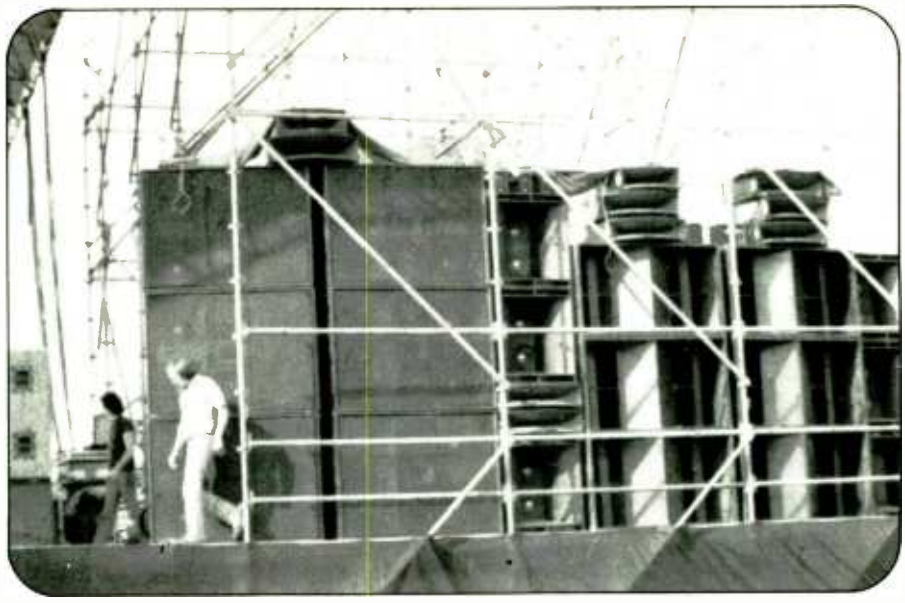


Figure 9: An outdoor concert in Adelaide, South Australia, offered a unique opportunity to stack the Jands "Concord" cabinets against Concert Sound's traditional component system.

The final show of the tour was in Adelaide, South Australia. There, the sound crew was given an unusual chance to compare the modular Concord speaker system with a conventional component system, in a side-by-side set-up (Figure 9). Jands had chosen to subcontract half of the house speaker system from a local Adelaide company, Concert Sound Limited. The Jands system was continuing west to start another tour that did not require such a large system as ours,

so local rental was a logical choice. Each sound wing was filled with six Concord cabinets, and a corresponding amount of speakers which were supplied by Brian Rosser's Concert Sound.

According to Rossner, "Comparison of our two EQ curves was quite interesting. I found the required curve for the component system to be a bit smoother, particularly in the low-end." The component system consisted of W-bins fitted with JBL 2205 speakers, double-twelve cabinets loaded with JBL E-120 cones, and 90-degree radials backed with 2441 drivers. The top end was covered by clusters of JBL 2405's.

Brian Rossner built the system around BGW power amps. "Believe it or not," he says, "I can get these amps down here for a significantly lower number of dollars than I would have to pay for a similarly-rated Phase Linear model." He was not the only engineer who agreed that high import duties have quite a lot to do with the final choice of which brand of equipment to purchase. And when the tariffs get too high, then it's off to the drawing board to design your own.

A Final Word of Advice

With quality audio gear being readily available in Australia and New Zealand, fewer sound engineers are finding it necessary to bring mixers, processing gear, and microphones into the country with them. This, of course, cuts down considerably on the paperwork required to get in and out of Australia and New Zealand; the fewer items to check through customs, the easier the trip is on the sound crew. But that favorite microphone, perhaps, or that indispensable EQ rack may still make you feel more comfortable. However, take along your own spares for any items such as monitor speakers. Imported parts are much more expensive than you would expect, and are sometimes not available at all. And, be prepared to part with what you bring: a stage hand in Auckland, New Zealand, offered to buy our entire supply of duct tape, and even wanted to purchase my cowhide workgloves!

Another aspect of touring in this part of the world that needs addressing is the work permit: Australia's immigration and entry laws are quite strict, and the Australian Consulate requires proof of specific employment while in their country. A working-status entry permit will be issued only upon presentation of signed contracts for concert dates. The touring group's management should allow plenty of extra time before the proposed tour to take care of details such as this, to avoid the disappointment of having to leave part of the crew behind.

Generally, as in any project, advance planning, attention to detail, and the desire to do the best job possible can all help make touring in this region a very rewarding experience. And, without a sound system to haul around with you, it can almost be like a paid vacation.

As the level of concert sound system technology in Australia and New Zealand has steadily moved upwards, more and more touring acts are feeling comfortable with the available sound systems. If you are planning a concert tour soon to this part of the world, it is good to know that the boys down under do, indeed, have "The Right Stuff." ■■■

Sound Companies Mentioned in This Article

ARTIST CONCERT TOURS
31 Fraser Street
Airport West 3042
Melbourne, Victoria
Australia
Telephone: (03) 338-9733

BARTON SOUND
Auckland, New Zealand
Telephone: 64 - (73) 2416

CONCERT SOUND PTY., LTD.
200 Gouger Street
Adelaide, South Australia 5000
Telephone: (08) 515-206

JANDS CONCERT PRODUCTIONS PTY., LTD.
P.O. Box 78
St. Peters 2044
New South Wales
Australia
Telephone: (02) 516-3622
Telex: AA 25858

STUDIO FACILITIES EQUIPMENT PEOPLE UPDATE

Northeast:

☐ **FRANKFORD/WAYNE MASTERING** (New York City) has installed a Sony PCM-1600 Digital PCM System for in-house disk mastering or outside rentals. Frankford/Wayne is described as the first independent disk mastering facility on the East Coast to purchase the Sony system. Owner **Tom Steele** is also putting the finishing touches on his new Room F, a completely digital disk mastering facility, scheduled to open in July. *1697 Broadway, New York, NY 10019. (212) 582-5473.*

☐ **THE MUSIC WORKSHOP RECORDING STUDIO** (Utica, New York) has added a UREI 1176LN limiter, two Valley People Dyna-Mite combined expander/compressor/limiters, an Orban 674A stereo parametric EQ, Crown D-150A Series II power amp, AKG K-130 headphones, Quartz-based chromatic tuner, plus Sennheiser MD-421 and AKG C414 EP/P48 microphones. The eight-track facility is owned by **Billy** and **Julia Scranton.** *1521 Oneida Street, Utica, NY 13501. (315) 735-7434.*

FRANKFORD/WAYNE MASTERING

☐ **EASTERN ARTISTS RECORDING STUDIO** (East Orange, New Jersey) has purchased a Dolby M-24 rack of noise reduction, UREI 813A monitors, a Studio Technologies Ecoplate reverb, PCM digital delay, and a Linn Drum Machine. *36 Meadow Street, East Orange, NY 07017. (201) 673-5680.*

☐ **TROD NOSSEL RECORDING STUDIOS** Wallingford, Connecticut) has added an RCA BA6A tube limiter and a refrigerator, the latter for "keeping the client's liquid refreshments at the right temperature." *10 George St., Wallingford, CT 06492. (203) 265-0010.*

Southeast:

☐ **DOPPLER STUDIOS** (Atlanta, Georgia) has unveiled its new audio sweetening facility. Equipment includes the new Sony 5850 VCR with a Sony PVM 1900 video monitor, two BTX Shadow synchronizers with BTX command console, a BTX 5400 SMPTE reader/generator and a Multi Track Magnetics 16/35 mm pickup/recorder with SETC II timecode generator. All equipment interfaces with 24- and 16-track recorders in Studios A, B, and C. *1922 Piedmont Circle NE, Atlanta, GA 30324. (404) 873-69411.*

DUKE UNIVERSITY STUDIOS

☐ **DUKE UNIVERSITY RECORDING STUDIOS** (Durham, North Carolina) recently took delivery of a custom 20-in/16-out Neotek Series II recording console for its three-studio complex. The facility is an 8-track studio with MCI and Otari tape machines, Dahlquist monitors, HH and Crown amplifiers, Dolby and dbx noise reduction, and dbx, Delta Lab, and Orban outboard gear. A new duplication suite recently has been finished for short-run, audiophile work. The equipment includes Nakamichi ZX-7 machines for real-time work, and an Infonics 200 System for high-speed projects. Also available are full remote services, including a Midas 24/6/2 console, and a full complement of microphones. **Frank Konhaus** is the studio's chief engineer. *036 Biddle Music Building, Duke University, Durham NC 27708. (919) 684-3460.*

☐ **THE ROOM** (Greenville, South Carolina) recently added a pair of JBL 4313 monitors and a Studer B-67 two-track, to complement the facility's Neve 8058 automated console and MCI 24-track, according to chief engineer **Eddie Howard.** *10 Michael Drive, Greenville, SC 29610. (803) 269-3961.*

Southcentral:

☐ **JUBILEE COMMUNICATIONS** (Pasadena, Texas) has rebuilt its recording studio, Rivendell Recorders. The control room has been completely redesigned under the guidance of **Glenn Meeks** of EA Designs, using the TEF test system. The studio's equipment list includes a Studer A80 MK III 24-track, a fully automated Trident Series 80 console fitted with 32 channels of Melquist fader automation, and an Otari MTR-10 two-track. Recent mike acquisitions include six Neumann U67's, and a Telefunken U47. Outboard gear features an AMS digital reverb, EMT 140ST tube plate reverb, Eventide Harmonizer, UREI, dbx, and Eventide compressors, EXR Exciter, Loft 450, two Delta Lab DDL's, Valley People Kepex II rack, and various graphic and parametric equalizers. Monitoring is handled by UREI 813's, JBL 4311's and Auratones driven by HH and Crown amps. *2223 Strawberry, Pasadena, TX 77502. (713) 472-5563.*

JUBILEE/RIVENDELL RECORDERS

☐ **PAPION SOUND MASTERS** (Houston, Texas), a new studio owned and operated by **Julius Papion** and **Lewis Minnella,** features a TEAC Tascam Model 85-16 recorder, Sound Workshop Model 30 board, Ampex Model 440-C two- and four-track, MXR digital delay, Studio Technologies Ecoplate II, Sound Workshop two-channel spring reverb, two MXR 31-band graphic equalizers, Omnicraft GT-4 noise gates, Altec 604 Big Red and Auratone speakers, and dbx noise reduction. Mikes include models by Shure, E-V, AKG, Sennheiser, Beyer, and Neumann; amps are by Sony and Marantz. The majority of the studio's equipment was supplied by Martin Audio, of New York City. *1214 Canterville, Houston, TX 77047. (713) 434-9310.*

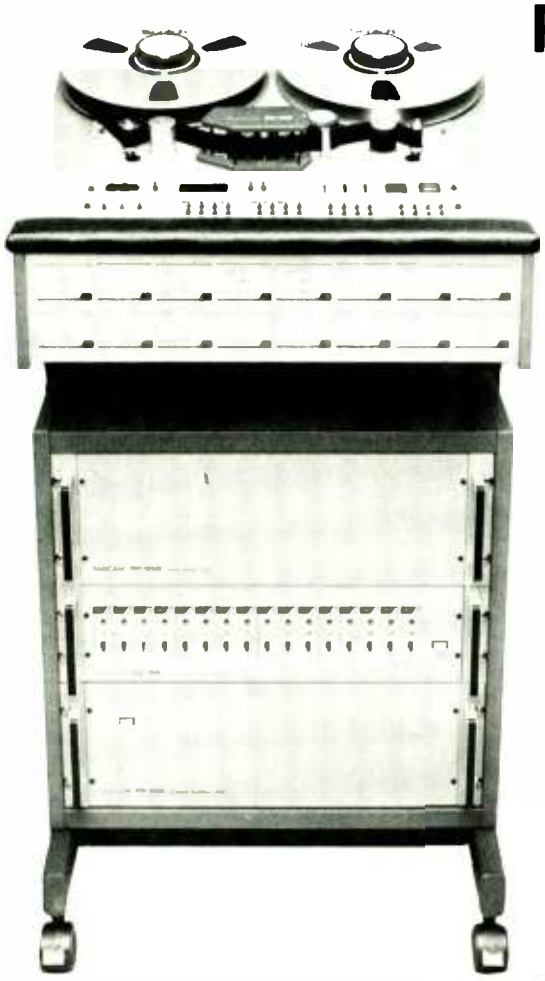
☐ **STARGEM STUDIOS** (Nashville, Tennessee), described as the first "from the ground up" studio to be built on Music Row in over two years, will be equipped with an MCI transformerless JH-636-36 console with full atuomation, a new JH-24 multitrack, and a JH-110B ½-inch two-track for mixdown. Peripheral equipment and studio design were by **Audio Architects,** and construction will be managed by **Chuck Gardener** of Gardener and Glover Inc., also of Nashville. Opening is slated for September 1, 1982. Commenting on the equipment selection, Stargem Records president **Wayne Hodge** says that, "In these times we knew we couldn't compromise on technical excellence, so we took time to evaluate other gear. MCI equipment proved quieter than any other make, and 30 IPS mastering on the JH-24 for mixdown to ½-inch stereo assures us of the cleanest, quietest tracks —making the use of our dbx noise reduction a client option." *Music Square East, Nashville, TN.*

MUSICIAN'S RECORDING STUDIO

☐ **ASSOCIATED PRODUCTIONS OF TEXAS** (Austin, Texas) has completed a newly-installed multitrack recording studio and sound reinforcement system for the Sufi Moslem Religious and Educational Center, at Bayt-el-Din. Located in the central Texas foothills, the Center intends to record conferences and produce training programs. A video studio, designed primarily for remote use, is also being planned. Complete interface between audio and video studios will finish the next phase of construction. *10010 Memorial Drive, Suite 807, Houston, TX 77024. (713) 780-7227.*

☐ **MUSICIAN'S RECORDING STUDIO** (Houston, Texas) has re-equipped with a Quad-

Introducing the TASCAM STUDIO SERIES Model 16 Mixer with the 85-16B 1" Recorder



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MARTIN AUDIO VIDEO CORP. 423 West 55 Street New York, NY 10019 (212) 541-5900	**CRAMER** 120 Hampton Avenue Needham, MA 02194 (617) 449-2100 (800) 343-5800	**AVC SYSTEMS INC** 7116 W. Higgins Avenue Chicago, IL 60656 (312) 763-6010

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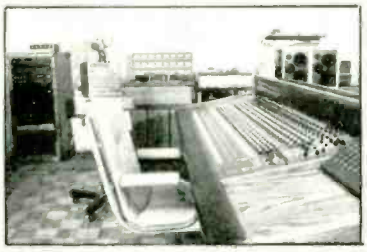
STUDIO FACILITIES EQUIPMENT PEOPLE UPDATE

Eight Pacifica 28/24 console, a Studer A80 24-track recorder with autolocator, a Lexicon Model 224 digital reverberator, UREI 813 Time-Aligned monitors with White Instruments room EQ, plus Delta Lab DL-1 and DL-2 digital delays. Also, for a live acoustic in the recording of horns, strings, and vocals, the studio boasts a newly-completed acoustic chamber. *1423 Richmond Avenue, Houston, TX 77006. (713) 521-9887.*

Midwest:

☐ **SOLID SOUND** (Hoffman Estates, Illinois) has installed a Sound Workshop Series 40 36-in/24-out console with ARMS Automation, linked to an MCI JH-24 transformerless 24-track with Autolocator III. Other studio hardware includes an Otari MTR-10 mastering machine, a Studio Technologies Ecoplate, and a new monitoring system designed by **George Minol** of Continental Sound, including room monitors and near-field MDM-4's. Video equipment includes both Beta and VHS formats, with an RCA color video camera. *2400 West Hassell Road, Suite 430, Hoffman Estates, Illinois 60195. (312) 882-7446.*



SOLID SOUND

☐ **PARADISE RECORDING STUDIOS** (Indianapolis, Indiana) has opened a new multitrack recording facility equipped with Ampex and Tascam recorders with dbx noise reduction, a modified Quantum Audio Labs console, and a wide variety of outboard equipment. Complete with remote-controlled lighting, the new studio complex is said to feature "acoustics and aesthetics blended to achieve a truly inspiring creative environment," according to the facilitiy's president, **John Blankenship**. *1815 North Meridian Street, Suite 101, Indianapolis, IN 46202. (317) 924-4441.*

☐ **CASTLE RECORDING COMPANY,** (Lake Geneva, Wisconsin), formerly Shade Tree Studio, has opened a new 8-track room equipped with an MCI JH-110 8-track 1-inch, two Studer and an MCI 2-track, and a Neotek 16/8 console. The new room is connected to the main control room and studio so that projects may start out at the 8-track rate and move up to 24-track if needed later on. The announcement was made by general manager **Paul Davis**. *P.O. Box 168, Lake Geneva, WI 53147. (414) 248-2400.*

PARADISE STUDIOS

☐ **HEDDEN WEST RECORDERS** (Chicago, Illinois) recently had Perception, Inc.'s **George Augspurger** consult on the remodelling of its Studio A control room. Monitor speakers were re-positioned to improve the center image and achieve a smoother response through mid-bass frequencies, and new absorptive and reflective elements mounted on walls and ceiling, as well as a new island of hardwood floor at the console. The purpose of the remodelling was to achieve the best possible blend of direct and reflected sound at the console, and to maintain the same basic sound image at the rear listening area. Bass trapping was also increased in the front of the room to develop a more "neutral, solid low-frequency sound." *1200 Remington Road, Schaumburg, IL 60195. (312) 885-9378.*

☐ **THE COUNTERPART RECORDER** (Cincinnati, Ohio) has installed a new Lexicon Model 224 Digital Reverb, and an Eventide H949 Harmonizer. *3744 Applegate Avenue, Cincinnati, OH 45211. (513) 661-8810.*

ALPHA RECORDING

☐ **ALPHA RECORDING** (Lombard, Illinois) recently replaced its existing 24-track machine with new MCI 24- and 2-track machines, and added a second Studio Technologies Ecoplate to its equipment list. *515 W. Harrison, Lombard, IL 60148. (312) 495-2241.*

☐ **NIGHTWIND RECORDING STUDIO** (St. Peters, Missouri) is a new studio that features a TEAC Tascam 80-8 8-track with dx-8 noise reduction, TEAC 3340 4-track, Pioneer CT-F900 cassette deck; Tascam Model 5, TEAC/Tascam Model 1, and Tapco 6000R consoles; MICMIX Master Room XL-305 reverb; plus microphones by Audio-technica and Electro-Voice. The announcement was made by owner **Luke Holton**. *7 Lake Superior Drive, St. Peters, MO 63376. (314) 441-2442.*

☐ **JUBAL RECORDING** (Duluth, Minnesota) has expanded from 8 to 16 tracks with the addition of a Tascam 90-16 multitrack, and a TEAC/Tascam Model 15 console. Also, the control room and studio were remodeled to double the plant size to approximately 450 square feet. The 80-8 will be incorporated into the location recording facilities, upgrading that from 4 to 8 tracks. *P.O. Box 3234, Duluth, MN 55803. (218) 728-6584.*

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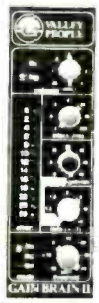

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STUDIO FACILITIES EQUIPMENT PEOPLE UPDATE

Midwest:

☐ **SOUNDTREK RECORDING STUDIO** (Kansas City, Missouri) has opened its third studio, equipped with a Neotek Series I 12/8 console, an Otari 5050B MKIII-8 8-track, a Scully 280B 2-track and full-track, UREI 811 monitors, Crown power amplifiers, and other outboard equipment. The studio has also purchased a new Otari MTR-90-II 24-track machine, which will be added to its 24-track room when the remodeling is completed. The studio room should be completed in mid-July, and furnished with Otari, Neotek, UREI, Crown, Lexicon, and more. All of the equipment was supplied by Flanner's Pro Audio Inc., of Milwaukee, Wisconsin. *3727 Broadway, Kansas City, MI 64111. (816) 931-TREK.*

☐ **AMERISOUND** (Columbus, Ohio) has taken delivery of a Neotek Series II 28/24 console, an MCI 24-track machine, and ADS BC-8 studio monitors. The new equipment upgrades the studio from an 8-track to a 24-track. Flanner's Pro Audio furnished the equipment. *209 South High Street, Columbus, OH 43215. (614) 224-7878.*

☐ **SIGHT & SOUND** (Omaha, Nebraska) has completed the total re-equipping of both its studios, including a Neotek Series II 20/16 console, a Neotek Series I 16/8 console, an Otari MX-7800 1-inch 8-track, an Otari 5050B MKIII-8 8-track, Scully and Otari 2-tracks, and JBL monitors powered by Crown power amplifiers. The equipment was provided by Flanner's Pro Audio Inc. *6969 Grover Street, Omaha, NE 68124. (402) 393-0999.*

Mountain:

☐ **HIGH PLAINS AUDIO RECORDING STUDIOS** (Denver, Colorado) has appointed **Pete Dockendorf** to the position of studio manager. Dockendorf brings to the position eight years of experience in studio recording and live sound reinforcement. He will also continue as chief engineer for the 8-track facility. *1108 E. 17th Avenue, Denver, CO 80218. (303) 832-3999.*

☐ **LUXURY AUDIO WORKSHOP** (Las Vegas, Nevada) has installed Lakeside LM1 monitors fitted with TAD components. The new installation is said to be the first such monitoring system in Las Vegas. *2570 East Tropicana Avenue, Suite 19, Las Vegas, NV 89121. (702) 451-6767.*

Southern California:

☐ **SUNWEST RECORDING** (Hollywood) has opened Studio "B," which features an ease of communication which automatically mutes the API console no matter what mode it is in, and eliminates chatter and crosstalk with dbx limiters, an extensive parametric equalizer, and UREI noise filter. A large isolation booth will easily hold six people. Equipped for 16- or 24-track sessions, the new studio has an Adams-Smith synchronizer that handles up to three audio/video machines, two 2-tracks, Sony BVU800 ¾-inch video machines, switch masters for 16- and 24-track and SFX cartridge machines. *5533 Sunset Blvd., Hollywood, CA 90028. (213) 466-9611.*

☐ **CONWAY RECORDERS** (Hollywood) has added a new Studer A800 24-track recorder, while retaining an existing A80 MKIII 24-track for 46-track capability. The new Studer, with its microprocessor control, is considered the "perfect complement to Conway's previously acquired Audio Kinetics Q-Lock synchronizer." An AKG C24 stereo tube microphone has also been added to the studio's collection. *655 N St. Andrews Place, Hollywood, CA 90004. (213) 463-2175.*

GOLDWYN WARNER HOLLYWOOD

☐ **DAVLEN SOUND STUDIOS** (Universal City) has completed installation of a 56-input Solid State Logic console with Total Recall Automation, and dual Studer A-800 24-track machines interlocked for 46-track via an Audio Kinetics Q-Lock SMPTE synchronizer. "The installation of the SSL," says studio owner **Leonard Kovner**, "and the overall technical updating in process will bring Davlen to a state-of-the-art level unsurpassed in the industry. We feel the studio should look as good as it sounds, so we're going ahead with a complete floor-to-ceiling cosmetic renovation as well." *4162 Lankershim Blvd., Universal City, CA 91602. (213) 980-8700.*

☐ **GOLDWYN WARNER HOLLYWOOD STUDIOS** (Hollywood) has installed a new three- to four-mixer position Harrison console in its re-recording Stage D. The new console features 60 inputs and 24 output groups, with parametric EQ on each channel, and is automation-ready. Each channel is provided with a 2-3 track panpot, and four auxillary joysticks for panning. The announcement was made by **Don Rogers**, the facility's technical director. *1041 N. Formosa Avenue, Hollywood, CA 90046. (213) 650-2581.*

☐ **NEIMAN-TILLAR ASSOCIATES** (Los Angeles) has installed an ACCESS computerized sound effects selection and editing system, said to be the only such system that performs this by using digitized sound data. The ACCESS system employs a library of effects digitally recorded on computer disk packs. An inventory or "menu" of different effects is shown on a display screen by category. Using the keyboard, the chosen effect is immediately played. The sound can then be altered with equalization and speed, if necessary, and synchronized to the film or video picture. If the effect is suitable, it can then be saved in the computer's memory, and recalled exactly as programmed. The editor continues the selection and storage of all the required sounds according to the logged footage numbers. This data is typed into the computer with an SMPTE timecode reference, thereby achieving positive sync between picture and sound. When the editor finishes an effect or a reel of effects, he can play it back instantly in sync with the picture. When the editor is satisfied with the way his reel is cut, the sound department does a lay-off; this is a transfer by the computer to 35mm magnetic film or 16-track audio tape from the computer memory. At this point the computer prints out a complete, orderly cue sheet. *6200 W. 3rd Street, Los Angeles, CA 90036. (213) 937-2460.*

NEIMAN-TILLAR ASSOCIATES

FRED JONES RECORDING

☐ **DUCHESS STUDIOS** (Whittier) has added a large isolation room to house its new Kawai 7-foot 4-inch grand piano. The recently remodeled control room features a new AMEK Model 2000A VCA-controlled board, and UREI monitors. The studio is being managed by producer/engineer **Paul Svenson.** *7923 Duchess Drive, Whittier, CA 90606. (213) 695-7715.*

☐ **FRED JONES RECORDING SERVICES** (Hollywood) is a new facility specializing in radio and television commercial production. Designed to take the client from conception to multiple copies, the studio is equipped with an extensive sound effects and music library, synthesizer and a large collection of outboard equipment. Owner **Fred Jones** is a former staff engineer at Wally Heider and other Los Angeles studios; he most recently produced two new Firesign Theatre albums at the new facility. *6515 Sunset Blvd., Suite 205, Hollywood, CA 90028. (213) 467-4122.*

Northern California:

☐ **HYDE STREET STUDIOS** (San Francisco) has purchased a stereo EMT-140 plate reverb, a complete Audio & Design Scamp effects rack, two Neumann M-49's, an AKG C-12, and a pair of AKG C-24 stereo microphones. *245 Hyde Street, San Francisco, CA 94102. (415) 441-8934.*

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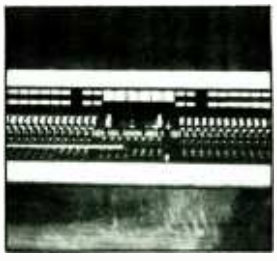
STUDIO FACILITIES EQUIPMENT PEOPLE UPDATE

☐ **HEAVENLY RECORDING STUDIOS** (Sacramento) has added another Technics M85 MKII cassette machine, an additional Teletronix LA-2A, and six Allison Gain Brain compressor-limiters. New additions to the studio's mike list include two Neumann U-47 FET's, an AKG C-34, Countryman EM-101, Crown PZM-31, and a Sennheiser MD-409. *602 Bercut Drive, Sacramento, CA 95814. (916) 446-3088.*

Northwest:

☐ **SOUND SMITH STUDIOS** (Portland, Oregon) has completed the installation of a new custom-made, 32-input/32-output mixing console for control room 1. The 9½-foot console features eight panable, mutable subgroups, a 300-point patchbay, and a producer's desk. Equalization consists of shelving high- and low-frequencies, and fully-parametric midrange; an outboard rack of Audio&Design Scamp EQ can also be accessed via the patchbay. Six cue/effects busses are provided, and the centrally located bank of eight subgroups each has its own output VU meter (the studio plans to automate the subgroups in the near future). According to studio president **Greg Smith**, the new console can also be used for film mixing duties, and features three large VU's for monitoring left, right and center outputs. *426 NW 6th Avenue, Portland, OR 97209. (503) 224-7680.*



SOUND SMITH STUDIOS

☐ **THE NOVA MUSIC GROUP** (Seattle, Washington) has named **Terry Date** as staff engineer. Date is said to have a strong background in audio-video interface, and will be "a valuable addition to the studio's BTX Shadow synchronization system video sweetening facilities. *1001 4th Avenue, Suite 3618, Seattle, WA 98154. (206) 447-1696.*

Canada:

☐ **MUSHROOM STUDIOS** (Vancouver) has added a Lexicon Model 224 Digital Reverberator, said to provide "high-quality simulation of the acoustics of a variety of architectural spaces." *1234 West 6th Avenue, Vancouver, Canada V6H 1A5. (604) 734-1217.*

Great Britain:

☐ **REVOLUTION STUDIOS** (Cheadle Hulme, Cheshire) has just completed a full rebuild and equipment update. The studio and control room have received Eastlake acoustic treatment, with the addition of a vocal overdub room. A new AMEK M2500 console has been installed, working with an Otari MTR-90. Monitoring is by JBL units driven by HH V-800 Mosfet amplifiers. Outboard equipment and instruments available at no extra charge include two Lexicon 224 and one AMS digital reverbs; AMS digital delay and pitch shifter; AMS stereo delay; a complete selection of compressors, limiters, and graphics; 24 tracks of dbx noise-reduction; two Otari ¼-inch mastering machines; and microphones by Neumann, Schoeps, Beyer and Calrec. Instruments include a Yamaha grand piano, Yamaha CP-80 electric piano, Fender Rhodes, and numerous guitars, amps, and a Slingerland drum kit. *11 Church Road, Cheadle Hume, Cheshire, England. (061) 485-8942.*

— *AUDIO/VIDEO UPDATE* —

Eastern Activity:

☐ **CENTURY III AUDIO** (Boston, Massachusetts) has completed an audio/video project *Joan Armatrading, Live at the Orpheum*, produced by **Joe Spaulding** for Don Law Productions. Post-production video was done at Century III with **Rob Hill** and **Alan Smith** of Studio B at the controls, using two BTX Shadow units to synchronize 24- and 4-track audio transports with a VCR for the mix. The show is the first in a series of Music Video programs which will be airing on Star cable TV service. *545 Boylston Street, Suite 505, Boston, MA 02116. (617) 267-9800.*

☐ **EDITEL NEW YORK** (New York City) plans to open a "state-of-the-art" sound mixing facility in September. Mixing capabilities will range from all forms of video programming — commercials, cable, concerts, entertainment specials — to record albums. Virtually every format tape machine will be available (from 2- to ¼-inch), plus cartridge machines, 35/16-mm film, and VTR's. Studer A800 multitracks will be used in conjunction with a custom-designed Solid State Logic 4000E automated console. "Sonic performance of the new Editel mix room will match any major recording studio control room," says studio designer **Vin Gizzi**, who is in charge of the project. Acoustical designer **Carl Yanchar** is also working on the new installation, which will be capable of music mixing, with the usual array of outboard gear and echo chambers, in addition to building and mixing tracks for television programs. All machines can be operated with or without SMPTE timecode and locked to picture at all times. The SSL console automation software will allow an operator to perform scene-by-scene dialogue equalization, sound effects cues, frame accurate pick-up recording and fully automated dynamic mixing. *222 East 44 Street, New York, NY 10017. (212) 867-4030.*

☐ **VCA/TELETRONICS** (New York City) has re-opened Studio B, a totally redesigned 1-inch, Dolby-stereo editing suite. In addition to its total format flexibility— from ¾-inch to 2-inch VCR/VTR — Edit Studio B is highlighted by its aural design. "This brand new, acoustically treated, state-of-the-art editing suite is as close to a sound recording studio environment as a video facility can be," says **Patrick Howley**, manager of engineering and technical maintenance. The new 1-inch on-line editing suite features a CMX-340X with all available options; four 1-inch Sony BVH-1100A U-Matics with dynamic tracking and Dolby noise-reduction; a Grass Valley Model 300 switcher; a Grass Valley serially controlled audio package; a Neve custom-modified 8-channel audio mixer; and Teletronics' "Very Intelligent Interface," which provides full computer control of the video switcher, audio switcher digital effects systems, Chyron, and audio tape recorders. Studer A800 24-track and 4-track machines have been specified; since the standard production model of the A800 is not available in the 4-track configuration, it had to be specially built by Studer. *231 East 55th Street, New York, 10022. (212) 355-1600.*

☐ **SHEFFIELD RECORDING** (Phoenix, Maryland) has completed a new 30-foot Road King Video truck equipped with Ampex 1-inch VTR's and CMX editing, and is now gearing up for location shooting of concerts and musical specials. The facility recently added an Allison/Valley People Fadex automation system in its 24-track audio studio. *13816 Sunny Brook Road, Phoenix, MA 21131. (301) 628-7260.*

Western Activity:

☐ **CRYSTALITE PRODUCTIONS** (Venice, California) recently completed a 60-minute video special for Earth Wind & Fire, co-produced by director **Michael Schultz** and the group. The show is described as an in-concert look at EW&F and its music, utilizing material shot during the band's recent North American tour. Editing was done at The Videography Co. and Pacific Video, with special effects added by analog computer at Image West. *Earth Wind and Fire in Concert* is said to mark the first time that an in-concert film of the band has been made available for television. Plans for distribution via cable and pay-TV outlets are currently under negotiation. *356 Hampton Drive, Venice, CA. (213) 392-8879.*

Submissions for *Studio Update* should include the address and phone number of the audio or video facility, and be sent to:
Studio Update, R-e/p, P.O. Box 2449, Hollywood, CA 90028

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Film Sound

Sound Recording And Post-Production for "One from the heart"

Photography by Larry Blake

by Larry Blake

It's the middle of the night at the Zoetrope Studios mixing facility in San Francisco, during the final sound dubbing for Francis Coppola's *One From The Heart*. Richard Beggs, the film's sound designer, is punching the solo function switches on the board to see what is coming in. "What's that?" he suddenly exclaims. One track sounds funny — some bird chirps, stage noises and faint music — and it takes a second for Beggs to realize that the sound is what he had fed to the stage over the PA during the shooting of the scene.

By considering how Beggs came to be sending such information to the stage, and by tracing how this track — and dozens of others like it — found their way on to the final mix, this article hopes to provide a glimpse of how the soundtrack for this controversial film evolved.

It is a sad but true fact that the majority of soundtracks produced in Hollywood are not the end result of one person's taste, constantly refining ideas from the beginning of pre-production. Instead, they are stapled together by a crew of sound editors after a fine (final) picture cut is made. Given only a few weeks to prepare the soundtracks for mixing, each sound editor will cut only a reel or two (out of a total of between 10 and 12 used in an average film), and he/she is unable to stand back and look at the overview. Even though [illegible]

supervising sound editor, that person too, is handicapped by time constraints.

The cut tracks are then mixed in a few short weeks by a group of re-recording mixers, who possibly have never seen a foot of the film before reel #1 is threaded up on the first day of dialogue pre-dubs. Too often professionalism and talent are compromised by being given no more time than is needed to produce an acceptable soundtrack.

Since the beginnings of Zoetrope Studios in the late Sixties, Francis Coppola realized that sound was an incredibly cost-efficient tool with which to influence an audience. Making good on his belief that "sound was half of the movie . . . at least," Coppola built a mixing studio and gave Walter Murch, a young filmmaker only a year out of the University of Southern California film school, free rein to assemble and mix the soundtrack for Zoetrope's first feature, *The Rain People*. Murch went on to create the soundtracks for George Lucas' first two features, *THX-1138* and *American Graffiti*, and for Coppola's *Godfather* saga. On all these films Murch was given the wide latitude and trust needed to create, in Coppola's words, "half the movie." This trust was further extended on Coppola's films *The Conversation* and *Apocalypse Now*, where his responsibilities also included picture editing.

Although Walter Murch has moved on to writing and directing pursuits, this one-person/one-soundtrack approach is still standard operating procedure in the Bay Area, as is evidenced by the work of Dale Strumpell on *Dragonslayer*, Alan Splet on *The Black Stallion*, and Ben Burtt at Lucasfilm, Ltd.

To handle the sound design task on *One From The Heart*, Coppola picked Richard Beggs, who had done double duties on *Apocalypse Now*, both as a synthesist and as music re-recording mixer. In addition, Beggs recorded the narration and created the "ghost helicopter" sound effect which opens *Apocalypse Now*. For his work on *Apocalypse Now* Beggs won an Academy Award for Best Sound, sharing it with Murch, Mark Berger and Nat Boxer.

Previsualization

Beggs' work on *One From The Heart* commenced six months before sets were built or cameras turned. During this time he helped Coppola and the actors get a feel for the material.

"Originally the actors were brought up to Northern California to read the script sitting around on stools; very much like a radio play presentation," he recalls.

"I edited that ¼-inch tape and dumped it on a 24-track. Then I took the songs for the film that Tom Waits had generated at that early stage, which were a few,

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and fleshed out the rest with material from his records. I made a mono mix, including sound effects and ambiences, which was then transferred to ¾-inch U-Matic [video cassette]. By that time the art department in Los Angeles had done a storyboard of the entire picture, totaling maybe 1,000 drawings. These were put into a still-storage device, and synched to the mono mix of the track developed by the actors; it was like a cartoon of the movies, and proved to be a useful editorial tool. This is nothing new to people in commercials, but they work in 30- or 60-second time formats."

Work on the music score was being conducted at that time by Tom Waits and his long-time producer, Bones Howe. Howe, whose engineering career dates back to 1956, and who produced Sixties classics by the Association, Turtles, Elvis Presley, and Fifth Dimension (among others) recalls his first contact with *One From The Heart:* "In the original meeting that Tom and I had with Francis [Coppola] he said, 'What I really want you guys to do is go make an album called "One From The Heart," and then I'll make a movie that goes with it,' In fact we didn't work exactly that way, because Tom is not the kind of guy who sits down and writes on cue. He needs stimulus and inspiration and time. To write a dozen songs loosely to Francis' specifications was a big order, and something that Tom had never faced before.

"Francis had picked Tom because of an album called *Foreign Affairs* we had done, specifically a duet on it with Tom and Bette Midler called 'I Never Talk to Strangers.' It's a mini-story, a vignette of a guy and a girl sitting at a bar who start talking. She finishes every line by saying, 'But I never talk to strangers.' The concept of what the music for the film would be like evolved out of that, like it was happening at a piano bar, a lounge act kind of thing. Some of the music had strings added to it later to fill it out, and also to give it a more romantic feeling in places of the film where it needed that Hollywood tug. But, by and large, the accompaniment is Tom Waits and Pete Jolly on piano, Greg Cohen on upright bass, and Shelly Manne on drums, Teddy Edwards on tenor saxophone, and Jack Sheldon trumpet."

As the storyboard grew in complexity and the film evolved, more and more of Waits' original music was inserted, replacing the material from his records. At a certain point the drawings were replaced by Polaroids of rehearsals, and later by video rehearsals. Slowly the storyboard began to move and became the movie.

At one point the cast was taken to Las Vegas, where they shot a video version of the film in two days.

"If you looked at the first version we did to the drawings," says Beggs, "and also at the last one, with the video scenes, you would see a few vestigal remains of the very first stages, especially things like special effects."

Sound Production

Use of sound to establish the mood for the actors, and to give Coppola a feel for how the scene would play in the theater, was carried to the sound stage during shooting.

"Part of Francis' original concept of the film," Beggs explains, "was that we would utilize a lot of live theater techniques. One aspect of this is that during rehearsals, and sometimes during the actual shooting, when they would do run-throughs, I could feed atmospheres and ambiences for the actors to play against. At the same time, I could mix this and send it to Francis' truck, and he could look at his daily rushes instantly, with music and ambient effects. It was primitive, but in some cases it did help to create a kind of mood and atmosphere. If [the scene was] at the airport we would have jet sounds and cars honking; if it was outside at night, you'd hear crickets.

"Sometimes Francis would play one music cue against a scene, then another cue, then another one. The mood of the scene, and how the actors played it, changed according to the music that was played. When we would go for a take we would turn everything off, of course, so it wouldn't ruin the production track. But, in some cases, where Francis knew that he was going to loop a scene, or if there was no dialogue, we would let it play during the take." (The track mentioned in the beginning of this article was from one of these takes.)

The production recording was handled by Jim Webb, using a Stephens 8-track machine. Webb, who won an Academy Award for his work on *All the President's Men*, had previously used the Stephens recorder to help Robert Altman develop his controversial sound signature. Recording up to seven actors individually using wireless mikes, this system gave Altman the sonic control he desired in post-production [see: "Using the Multitrack Format for Production Film Recording," by Jim Webb and Don Ketteler; *R-e/p* April 1980 —*Ed*].

This technique, it should be noted, is extremely helpful when shooting with multiple cameras. It is nearly impossible to use boom mikes, because they can never get close enough for proper perspective for the close camera, without getting into the frame of the wide camera. Altman neatly solved both these problems by eschewing perspective and booms altogether.

The intent behind multiple tracks on *One From The Heart* was different, however, since Coppola planned to shoot the film in long takes, with the camera or cameras moving between sets. Boom and plant mikes in each room would be recorded separately, to allow for fine-tuning of the segues during final dubbing. But, as shooting progressed, only a few scenes were done in this manner, and most interested parties, including Webb and supervising sound editor Leslie Shatz, agree that a stereo Nagra would have handled the production chores nicely.

For a few scenes in which the talents of Steadicam inventor Garrett Brown were called upon for intricate moving camera shots, Webb and his boom operator, Chris McLaughlin, decided to go with a Nagra SN, the 21-ounce wonder that extracts a 63 dB signal-to-noise ratio from ⅛-inch tape running at only 3¾ IPS. . . . *continued overleaf* —

Interior of Jim Webb's sound van, with video monitors providing a through-the-lens view of the scene being recorded on the Stephens 8-track (right).

JIM WEBB

Audio Clearance

Qty	Description	List Price Each	Sale Price Each
1	Ampro CT 3555B Cart Player	$ 2,445	$ 1,900
1	BTX 4600 System	16,800	12,900
4	dbx 142 Noise Reducers	950	650
1	dbx 162 Comp./Limiter	750	550
4	EV DH-1506 Drivers	199	135
2	EV EVM-15L Speakers	180	125
6	EV HR-6040 Horns	250	75
5	EV HR-9040 Horns	250	75
4	EV Musicaster 1A Speakers	350	145
2	Fostex 3040 Dolby C -4 Channels	450	300
3	Fostex 350MB Mixers w/Meter Bridge	950	725
1	Fostex A4 Recorder	1,450	975
2	Fostex A8 Recorders	2,500	1,925
2	HME Systems 42C	1,400	700
3	HME Systems 22E-A1	2,300	1,500
4	HME Systems 22E-A4	2,300	1,500
4	HME Systems 25E-A2	2,450	1,600
1	HME System 25E-A4	2,650	1,800
1	Orban 111B Reverb	849	575
1	Orban 245E Synthesizer	399	275
1	Orban 622B Equalizer	799	575
1	Spec 3100 Speaker	550	175
1	Revox B-77 Recorder	1,799	1,500
4	Tannoy M-1000 Speakers	1,450	950
10	Tannoy SRM-12B Speakers	795	450
1	TEAC GE-20 Equalizer	350	195
1	TEAC X-10 Recorder	1,050	600
2	Technics WR-8816 Consoles	5,500	3,650
8	AKG C-452EB/BLK Mics	380	280
15	AKG D-320EB Mics	155	92
8	AKG D-130E Mics	100	51
6	AKG D-200El Mics	160	88
2	Ampex ATR 102 Recorders	6,995	4,495
2	Ampex AG 440C2 Recorders	6,995	4,495

Video Clearance

Qty	Description	List Price Each	Sale Price Each
1	Hitachi FP 40 S/P	$12,995	$ 4,995
1	Hitachi FP 40SS	18,995	5,995
1	JVC KY-2700-10X	11,995	5,995
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One from the heart

Because of the hassles with tangled cables on a hard-wired boom, and multipath problems with a wireless mike system, the use of a miniture Nagra was deemed the most practical solution. To learn the ins and outs of the camera stabilizing system he was chasing after, McLaughlin attended a training session For Seadicam camera operators.

"They had a practical house built on Stage 4 — walls, ceiling, floor," says Webb. "Nothing moved except a platform in the middle of the living room, which was used to move the camera between floors. During one sequence the actors literally ran from downstairs to upstairs, into bedrooms, into bathrooms, down hallways and back again. So there was really only room for Garrett Brown with his camera, his assistant with radio-linked follow-focus, and somebody with a mike and tape recorder.

"I'm not as good a boom man as I probably am a mixer, so the easiest thing to do was to strap an SN on to the mike man. But I had to give everybody on the outside an idea what was going on, so I put the 815 [Sennheiser shotgun mike] into a highly modified power supply/amplifier that strapped on the belt. It provided power to the 815, a split to the SN, another split to a radio transmitter, and also a good earphone monitor to the boom man.

"The SN has one of the best automatic gain control circuits I've ever worked with. You have some adjustment, and since the scene was pretty loud we cranked it down as much as we could.

"I use the SN only on specialized occasions. One of those times was on *Elvis On Tour*. We would stuff it in the limousine Elvis was riding in so he wouldn't think there was a soundman. He was pretty uninhibited, because all he saw was the cameraman with this enormous lens. We stuffed [the recorders] between the seats, and ran the mike cable up into the ventilator tube above his head and got a perfect track. We used it for the purpose for which it was designed — as a 'spy' machine. The problem when planting them though, is that you can't hear what's going down, and what you got until you play it back."

Since every foot of *One From The Heart* was shot inside the gates of Zoetrope Studios, one might think that Webb would have been spared the background noise problems that plague location soundtracks. No so, says Webb: "Many of the sets were exteriors built inside a sound stage. Francis wanted all the bushes and trees blowing in the breeze to make it look real, so they cranked up the fans. In some ways a location would have been *easier* than a stage."

Webb and McLaughlin were further hampered in their ability to get a clear production track because Coppola and his cameraman, Vittorio Storaro, photographed the film in the old "Academy" aspect ratio used before the advent of wide screens in 1953. The aspect ratio —relationship of the width to the height —of this format is 1.375:1 (though it is colloquially known as 1.33); therefore the height of the frame is not much smaller than its width. Modern aspect ratios, which are as wide as 2.40:1, have much less height and, therefore, possess more room for the boom operator to maneuver.

"Because of the 1.33 ratio, we had to hike ourselves up another foot and a half, two feet, with the microphone to stay out of the frame," says Webb. "When two actors walked off into a wide shot, the stage got boomy real quick."

Video Applications in Film

Webb recorded SMPTE timecode on track #8, next to a 60 Hz film sync reference tone on track #7. This same timecode was being fed to a bank of Sony SLO-383 Betamax recorders in Coppola's Image and Sound Control van.

It is important to note that this time-of-day SMPTE code recorded with each take was of no use during post-production, since the picture negative was not coded with the same information. Because of this fact, a usable timecode designation was not given to a scene until the dailies were transferred to video tape. Up until this point, standard film procedures were used: selected takes from the picture negative were printed and manually synched using the clap stick. Webb always mixed a mono guide track on to track #6, and this was transferred to 35-mm magnetic film by resolving from the 60 Hz tone on track #7.

At this point the sound and picture rolls were sent to be printed with edge numbers every foot. Following such a procedure, an editor can pick up any piece of picture or soundtrack and, with

FILM RE-RECORDING TECHNIQUES — A Different Set of Ground Rules from Conventional Recording Sessions

Although, courtesy of the explosion in sound for video productions, the recording-studio fraternity is meeting the film community halfway, recording studio procedures are still far removed from the unique demands of film sound, as practiced in Hollywood and elsewhere. Most of the differences between film and record sound are ones of scope. Practically every record, from Steely Dan to four-track demos, involves the mixing of just one (or, at most, two) multitrack tape(s) to a stereo master. Recordings are made under controlled conditions on to one piece of tape, generally broken down to receive one instrument per track, and thus do not require drastic changes in level or equalization during a number. Each song, consisting of 24 (or maybe in extreme cases 46) tracks, is a few minutes long, and its two-track mix is cut together with those of other songs to form album sides.

There is almost no such animal as an "average" film sound mix. From a relatively straightforward mono dialogue show, to a Dolby six-track Space Epic, the main common denominator is that certain technical and operational problems must be overcome before creativity can begin.

Film mixes are divided into 10-minute

... continued on page 82 —

Tom Scott (left) and Richard Beggs monitoring a final transfer at Zoetrope Studio's automated 28-input JH-500 Series console. Ancillary equipment includes an Audio-Kinetics Q-Lock 2.10 SMPTE synchronizer.

the help of the master log book, determine the take and scene number. Later, during the editing of the dialogue tracks, these numbers are used to help order reprints of selected takes.

The synched dailies were transferred to video tape on a Magnasync/Moviola Videola. To ensure that a given film segment matched its video copies exactly, the film ran at an effective speed of 23.97 frames per second during transfer. The SMPTE timecode was added at this stage, with a Control Video Corporation Intelligent Controller. Using a system developed by Clark Higgins, the SMPTE user bits recorded both 24-frame film and 30-frame video location numbers, which ensured that video edits could be found precisely on the film workprint. Also recorded were the roll number, scene and take numbers, negative key numbers, and the edge number printed on the picture workprint and soundtrack.

As the film was cut during shooting, and the need arose to take the storyboard into another level, Beggs made temporary mixes for cut sequences using an Ampex 8-track recorder and a portable Neve mixing console. The 8-track was locked to a Sony SLO-383 Betamax recorder via an Audio Kinetics Q-Lock 2.10 synchronizer.

"I choose the 8-track format," Beggs says, "because it forced me to work in a sparing way — I had only one track for the production dialogue, two for effects, and two for music. The other three tracks were SMPTE timecode, a blank guard bank, and a track to bounce the mix. The only [minor] problem was that, because of the timecode, you couldn't cut the 8-track tape to conform to any picture cuts. It was nothing to do a mix of the whole film in two days; sometimes three if it was an important screening." Beggs was closely assisted at this stage by Dave Carroll of the Zoetrope engineering staff.

The reason for using video tape in the production of *One From The Heart* centered around its ability to simulate for Francis Coppola an approximation of what a cut and mixed sequence would look like, thus giving him maximum information upon which to base decisions and weigh options. It should be noted, however, that contrary to reports in the press, *One From The Heart* was edited on film, using state-of-the-art splicing tape; video editing was used primarily as a sketch pad to try out ideas.

The chief advantage offered by film editing is the ease with which material can be inserted and deleted in the workprint. It is felt that video editing will not be able to touch this desired flexibility of film editing until it is stored in a random-access format.

Music Recording

As noted earlier, Tom Waits and producer Bones Howe began their work on the film's music early in pre-production. Actual recording began in October 1980, three months before filming started. As

DAVID ALEXANDER

Music recording producer Bones Howe (left). Crystal Gayle and Tom Waits.

Bones Howe explains, "Everything at that point was 'Try it on and see how it fits.' It ended up being that way throughout the whole film because, in fact, Tom never wrote a piece of music for any specific place in the film. The film kept changing so there was a constantly updated video version being made.

"Sometimes we would go in the studio and lay down a demo on two-track so that Tom could have a tape to take home and listen to. Often it was just a melodic segment with Tom, on piano, and his bass player. A lot of that stuff ended up being considered for the final film, because we couldn't re-capture on 24-track the mood that we got the first time through. The song 'Broken Bicycles' in the film is, in fact, a two track demo of Tom singing and playing piano, and Greg [Cohen] playing upright bass. It was done at the end of a session where we had recorded other music, and Tom said, 'Let me get this down on tape so I can listen to it.' We didn't even bother to make a 24-track of it because we assumed it would be re-recorded with a huge string section later, which in fact it was. But we ended up using the original two-track, because with the big string section it ended up sounding too dramatic."

Howe comments on his microphone selection: "With Waits I like to use a Shure SM-53. A [Neumann] U87 or other condenser mike accents the bad things aobut his voice. The dynamic is good for Tom because he can get his mouth real close, which he likes to do —it's like a stage mike in that sense. He can put his lips right up against the pop filter and it gives me good isolation, which I need since he's always close inside the rhythm section.

"I used an 87 for Crystal Gayle because her voice is very, very clear, and because I needed a mike that would handle her wide dynamic range without problems. She can go from very soft to very loud.

"I still hang on to some of the older microphone techniques. I use the RCA 77DX [ribbon] on brass exclusively, because I think the condenser microphones get all the sound of the embra-

One from the heart

ture, and none of the horn. It's a nicer sound on brass instruments, to my ears, and also to those of brass players. When Jack Sheldon heard a playback on this film for the first time he said, 'There's something you do with the trumpet that nobody else does.' I said it's because I'm the only guy who still uses ribbon microphones. Everybody has gotten so used to the sizzly sound of condenser microphones on brass, that the warm sound of a ribbon mike sounds dull to them. But, in fact, it's a lot closer to the *real* sound of the horn."

All music for the film was recorded on 24-track at Wally Heiders, Hollywood, using Dolby noise reduction. Although Howe was very aware of the requirements of film sound, having recorded and supervised the music for *Roadie*, he didn't feel that the medium's requirements differed greatly from those of the record world.

"The equalizing I did was just to make it sound good as though it were going to be a record," he says. "Richard [Beggs] and I decided that it didn't make alot of sense for me to hype up the sound. I don't do that anyway — I'm not a sound 'hype-er.' I like it natural-sounding. When I do pop records I do my share of equalizing like everybody else, but that's a different sort of thing. I looked at this as primarily a jazz score, and I was concerned that the instruments were rich and full-sounding because we didn't have a lot of them.

"I wanted the piano to have a 'fat' sound, and the bass to be big. I like to hear everything happening on a string bass because that's part of the excitement. I used a combinationof the pickup he had in the bass, and a live pickup with a microphone. I did a lot of juggling to get them in phase, by equalizing the two sources separately, so that when they were mixed together I got a nice fat bass sound. It's harder to tell phase problems on the bass than it is with instruments rich in high frequencies. So, by the time Richard got the material, those two signals were mixed together so that he got one signal on the bass. In addition to getting a fat sound, this made sure that there was no 'slipping and sliding' [localization problem] when it is transferred to the Dolby optical format."

Tom Scott at Zoetrope Studios.

The original 24-track tapes were mixed down by Howe to two Dolby-encoded, 8-track 1-inch tapes, with left-center-right music on tracks 1, 2 and 3, instrument solo on track #4 and vocal on track #5. Track #6 contained an additional vocal solo, if needed, track #7 a 60-Hz sync pulse, and track #8 SMPTE timecode. This was the most common format, since track assignments varied according to the needs of the number.

"I tried to give Richard the flexibility he needed," Howe offers, "so that if he had to use a piece of music two different ways in the film, he could use the piano trio with or without the strings — which were on tracks #6 and 7 on a few numbers — with or without the vocals; all various combinations."

"Piano was split left and right, bass in the center, saxophone and trumpet on the solo channel, and the singer on the vocal solo channel. I mixed it through the monitors the way I would want to hear the material as if they were for a record, except that I kept everything 'dry.'"

Two master 8-track tapes were sent to San Francisco for obvious reasons: safety, because of heavy editing or because a selection might be used more than once in the film; or because a picture change would necessitate a change in the music.

Final Music Assembly

With the picture workprint (hopefully) locked down to a final cut, Betamax copies were made that contain SMPTE timecode on track #2, counting from

FILM RE-RECORDING TECHNIQUES
— A Different Set of Ground Rules . . . *continued* —

reels, each of which can have as few as one, or as many as 200 tracks. The dynamics of each reel must take into account the rest of the film, since the audience will experience the film in one sitting.

Probably the biggest headache for sound editors and re-recording mixers is the cleaning up and matching of production dialogue tracks with looped (replaced) lines. For example, let's suppose that a scene is shot outside with a Sennheiser 815 shotgun mike, and during one shot it faces the traffic. Stuck in the middle of the scene is a looped line which was recorded on a quiet ADR stage with a Neumann U87 inches from the actor's mouth.

"Matching" also has to be considered in the machine room. Possibly the unofficial record for the number of sources was set during the mix of *Star Wars:* playback dubbers had to be aligned to the pink noise and Dolby tones of 10 different studios.

Standard film re-recording procedure dictates that, while dialogue, music and effects are of course monitored together, all three elements are handled separately in recording because of contractual requirements concerning foreign release. This problem is made even more hairy when the primary domestic release is in stereo: a stereo mix with dialogue, music and effects locked together on one piece of film does not meet foreign stereo or mono release needs. Therefore, the mix has to be recreated many times to separate all the necessary information.

Additional headaches at this stage concern the multitude of possible release formats, and their prespective monitoring standards. Another consideration these days is the choice between releasing a Dolby Stereo film with Dolby prints only, or with additional, separate prints and mixes for "Academy" mono playback. Still further allowances must be made for release in a magnetic format employing discrete playback channels.

The existence of codified monitoring standards is a double-edged sword for film re-recording mixers, since it is a small consolation knowing that a film was dubbed to a properly-aligned system, if those standards are then not observed by theaters. It is very hard even for people in the industry to judge the merits of a film mix, due to the atrocious sound systems and acoustics found in most theaters. The proliferation of Dolby Cinema Processors, with their built-in third-octave equalization, has been a big help in remedying this situation. Which is in contrast to the record world where, regardless of the monitoring set-up used for the mix, the final sound system over which it will be heard is the responsibility of the consumer.

Mixing sessions for films are, like the average shooting day, conducted under circumstances which are anything but conducive to creativity. Cue sheets, VU meters, footage counters and console all vie for the mixer's attention in a dark theater. Added to all these factors is the high probability of having a director and a producer who don't really care or know anything about the creative potential of sound.

Film sound is the last step in the course of making a movie, and as such is the one which most acutely feels deadline pressure when a fixed release date must be met. The sound crews for *Star Wars* and *Star Trek* were working until a few short days before their respective premieres. Undoubtedly the record for cutting it close goes to the film that touched off the wide screen, stereo sound phenomenon, *This is Cinerama.* Mixing continued until a few hours before the premiere, which was the first time anyone saw the complete, mixed film. ■■■

00:00:00:00 at the "picture start" frame. At a separate facility the production track was transferred to a 24-track tape, with a timecode generator locked to the playback dubber as it striped track #24 with SMPTE timecode, also starting at the picture start frame. A 60-Hz tone was "sucked" from the 2.4 kHz timecode, and placed on track #23. (The production track is on track #22.)

Using a Q-Lock 3.10 synchronizer, Beggs and his assistant Kathy Morton, locked the 24-track tape to the Betamax picture, and checkerboarded the music in an A-B fashion across tracks 11-20, leaving the first 10 tracks open for ambient effects, etc. All of the sound montage for the "Blues Town" sequence, when the film characters of Frannie and Hank are looking for their respective dates, was assembled by Beggs and Morton on the 24-track master. All elements on this tape were dbx-encoded.

Because the 8-track music masters were so heavily edited, the use, or non-use, of the SMPTE timecode on that tape was a moot point. As a result, almost all of the music was spun on to the master 24-track wild.

"Tom would do a six-minute song which I'd have to turn into a two-and-a-half minute song," Beggs recalls, "and I would end up with maybe six or seven deletions. We ended up VSO-ing some things to squeeze them in."

If a cue would need much editing, Beggs and Morton would make a scratch

Assitant engineer Kathy Morton, at Richard Begg's personal-use sound studio.

mix on ¼-inch tape, make test edits, place it on the 24-track, and see how it worked against the picture. The final cut would then be duplicated on the 8-track. Beggs notes that, "Interestingly enough, the cut always sounded better on the 8-track . . . less detectable. I guess it was because you could mix across the cut."

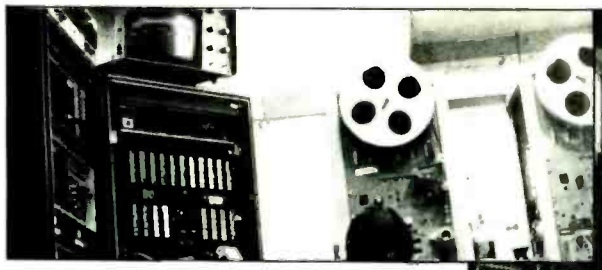
There was one instance, however, when it became essential to slave both the eight- and 24-track recorders to the picture. After the opening number, *Wages on Love*, had already been edited and placed on the 24-track master for reel #1, it was decided that horn overdubs were needed. SMPTE timecode and a rough music mix were transferred from the 24-track master on to a blank eight-track tape. Overdubs were recorded on that tape by Bones Howe in Los Angeles, and then sent back up to San Francisco to be laid in with the basic tracks on the 24-track master.

Picture changes necessitating changes in the 24-track were handled in two basic manners: either the material had to be rebuilt from scratch on another tape; or the appropriate offset was programmed and executed when making the master soundtrack during the final mix.

Dialogue and Effects Editing

The 24-track tape that Beggs and Morton assembled went directly to the final mix. All other sound elements — dialogue, hard sync effects, and most ambiences — were cut on film using conventional sound editing techniques. Beggs says that his personal philosophy was to "use the new technology where it helps you move faster; use it where you're learning something although you're working at the same speed as conventional techniques. But if you begin to give up something and have to slow down, then I choose not to use it. We are still involved with reality and deadlines, and having to get things out on time. That's the reason for the hybrid use of conventional film editing techniques and the tape medium."

Although Leslie Shatz cut dialogue and sync sound effects using a Moviola and standard techniques, he found that having the film on video tape made the "programming" (selecting) for ADR

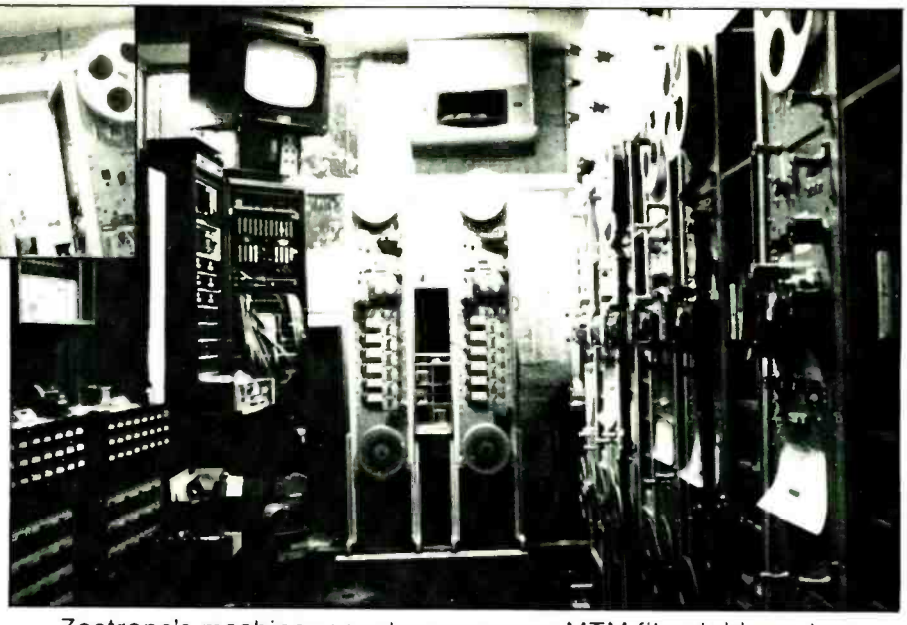


Routine pink-noise azimuth and EQ tests are made on the MTM mag transports.

sessions an easier task. Using notes made during a screening with Coppola, he could quickly fast-forward through a reel to the lines to be replaced, and find their in/out points.

Final Dubbing

The Zoetrope dubbing studio, built in 1977 to mix *Apocalypse Now*, was designed by Jeff Cooper, and features an MCI JH-500 Series automated console, and Multi-Track Magnetics film recorders and projectors. Because of space limitations in the machine room, which had room only for seven playback dubbers (plus two 6-track recorders), and on the MCI console, which is equipped with only 32 automation-controlled inputs, methods had to be devised to handle the large number of tracks required for *Apocalypse Now*. (For example, over 200 tracks were required for reel #6, the helicopter attack on the village.)



Zoetrope's machine room houses seven MTM film dubbers, two 6-track recorders, and two Ampex MM-1200 24-tracks.

To enable the mixers to handle more than seven reels at a time (each of which could contain between one and six tracks), the original elements on magnetic film were transferred 1:1 to a 24-track recorder, which was locked to the film chain via SMPTE timecode. This "regrouping" transfer was dbx-encoded, as was the resulting pre-mix. Because of the large number of pre-mixes, dbx noise reduction was found necessary to cut the noise buildup to a minimum.

The 24-track recorder was also used to mix music tracks to magnetic film. Originating in the studios of the seven synthesists hired to translate Carmine and Francis Coppola's ideas, the original 24-track music recordings were pre-mixed into quad groupings, with solo instruments kept separate.

At Zoetrope's dubbing studio, Richard Beggs would mix down the 24-track premixes to the six-track format used in *Apocalypse*: left, center and right channels behind the screen, left-rear and right-rear in the auditorium, and one track behind the screen for low-frequency information.

Zoetrope uses the same JH-50 automation system that comes with the MCI board. Automation is recorded on separate three-track magnetic film, as opposed to two tracks on the multitrack master, as is standard procedure in music recording. Tom Scott, dubbing mixer on *One From The Heart* (with Beggs and Jim Austin), explains the procedure: "Since they [music people] go in longer passes, all the way through the entire song, they only go between one [automation] track and another. We use three tracks in order to read from one track and record updated data on the other two, always keeping at least one track with the latest batch of updates on it. This allows us to do short, overlapping pickups in the data."

An interesting aspect of the Zoetrope automation system is the set of four automated quad panners. Their use in *One From The Heart* was basically for automated channel assignment. If a certain track had to be placed in the center speaker at the beginning of the reel, in the surround in the middle, and on the right at the end, these moves could be programmed in once and then forgotten.

. . . continued on opposite page —

Dolby Stereo Format

One From The Heart was mixed to the Dolby Stereo optical format. A Dolby DS-4 monitoring unit was used to process the four-track mix (left, center, right and surround — LCRS) into a simulated two-track release print, and then decoding that information back into four channels using the same Cat. No.150 card found in Dolby Cinema Processors.

All film elements were pre-mixed to six-track, dbx-encoded magnetic film. Dialogue pre-mixes usually contained three or four tracks, with production dialogue, ADR material and any processing kept separate.

Ambient and hard-sync sound effect each had its own six-track pre-mix. Ambient effects were sometimes mixed down to three stereo pairs, although usually two tracks would be used for mono information. During the stereo pre-mixes, information is also heard through the center speaker, and judgement can be made of stereo width, although stereo information is recorded essentially unchanged on two tracks.

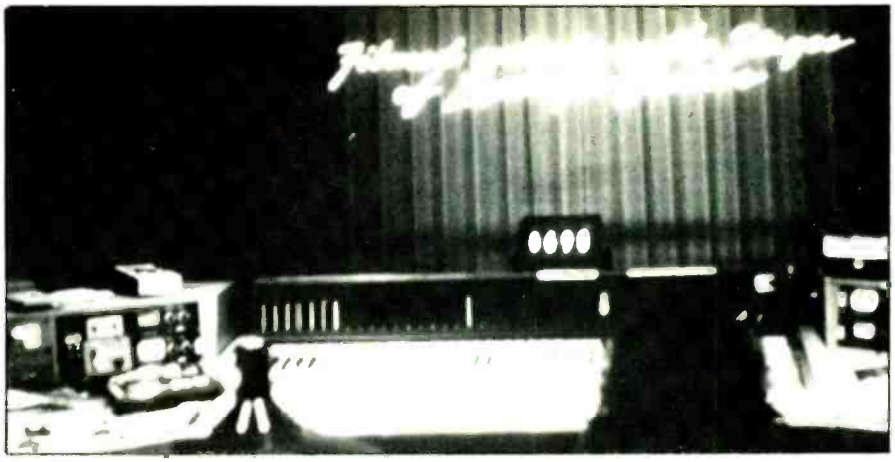
Final mixes were made to six-track, Dolby-encoded magnetic film, with an LCRS music and effect combine on tracks 1 thru 4, and with dialogue on track #5 — a format used to help facilitate changes in the mix. This final five-track mix was used to make the Dolby two-track printing master. Foreign stereo release was accounted for by playing the console automation data through each reel twice, and recording separate four-track music and four-track effects information. Tom Waits and Crystal Gayle's vocal tracks will not be dubbed for foreign release, and therefore were included on the four-track music "spit."

What for Richard Beggs began 20 months earlier on ¼-inch tape ended up in a screening room at Technicolor in Rome, where the initial release prints were checked. One can understand that he might be concerned about the all-important last step of print making.

"The first contact I had with film sound," he says, "was doing the music score for a 16-mm "art" film. I made a lot of mistakes, but when I heard what came out of the 16-mm lab and their low-budget sound processing, my mistakes were *nothing*. It was the worst-sounding thing I've ever heard in my life.

"At the end of the film, at the premier, the film maker asked people who had contributed to stand up. I pretended I wasn't there, and just slumped down in my seat. *That's* how ashamed I was. People just heard this *screeching* noise, and it says on the screen: 'Sound by Richard Beggs.' It doesn't say: 'Bad Processing by . . .' It makes the hairs stand up on the back of my neck just thinking about it!"

Film sound recording and post-production has certainly come a long way in such a few short years — at least for Richard Beggs, sound designer for *One From The Heart*. ■■■



Beyond The Studio Glass

Successfully Negotiating The Record Producer's Agreement

Part Three — RIGHTS GRANTED, RESPONSIBILITIES OUTSIDE THE STUDIO, AND CREDIT

The first installment of this article, published in the October 1981 issue of *R-e/p*, discussed the terms of a record producer's agreement with, and the services required by, record companies, artists and others. The first installment also contained a sidebar comprising a "prototype" record producer's agreement. The second installment, published in the December 1981 issue, concerned itself with the ways in which a record producer can ensure that he is fully compensated for his services on a recording project. This third and final installment discusses the rights a record producer grants in and has with respect to the tracks produced by him, and issues involving copyright, mechanical licenses, record credits and re-recording restrictions.

RIGHTS GRANTED BY RECORD PRODUCERS

A record producer usually must relinquish, in his record producer contract, any claim he has to the "results and proceeds of his services as a record producer," *i.e.* the physical tape produced by him, and the rights in and the sounds on such tape, and acknowledge that another owns, possesses, controls, and has the exclusive right to exploit and copyright the tape.

A. Ownership of tape and tracks on tape.

Ownership means that the owner has the right to possess, control and exploit the tape and the tracks on the tape, without any interference by the record producer who produced the tape.

Ownership of a tape can be absolute or qualified. The ownership of a tape is absolute when the owner has "dominion" over the tape and the tracks on the tape, *i.e.* "title" (the on-paper acknowledgement by a record producer that the tape and the tracks are owned by the person for whom the tracks have been produced, and that such record producer has no, and will not make any, claim to such tracks), possession and complete control over disposition.

The ownership of a tape is "qualified," or conditional, when, among other things, the use of the tape or the tracks on the tape is restricted, or the time of enjoyment is limited.

A record producer can, for example, request a "reversion" of ownership in the tracks for which he has paid, if certain terms of the contract transferring the ownership of the tracks are not performed. Thus, if a record company fails to release a record made from the tracks produced by such record producer, the track may "revert" to that record producer.

A record producer may produce tracks at the request of a record company or other third party "funding" or "financing" the project, or he may produce tracks at his own expense on a speculative basis (*i.e.* on "spec") and thereafter sell them to a record company, distributed label, an artist, or independent production company. In the former case, a record producer is usually not legally responsible to a record company or other financing party for recording costs. A budget is prepared by such record producer and approved by the record company or other financing party for which he is producing the tracks — invoices for the costs of recording the tracks are sent directly to and paid by the record company (although, in such "budget" situations, a record producer is usually responsible for "over-budget" recording costs (see October, 1981 issue).

In the latter case, known as a "master purchase," and in the case where a record producer furnishes the services of the artist he is producing and receives a recording "budget" or "fund," a record producer may be legally responsible for all or part of the recording costs until he delivers the tape to the owner or purchaser. In those instances, where a record producer may be legally responsible for recording costs, in the event that payment is not timely made, or recording costs are not paid as promised, ownership or "title" to (and possession of) the tracks produced should not be transferred by such record producer until any such "problem" is resolved.

Remember that while "possession may be nine-tenths of the law," when one deals with intellectual property —which is what the rights to sound recordings are legally known as — the critical issue of ownership thereto revolves around the on-paper rights of those who claim title to any such recordings.

B. Possession of tracks.

All tracks, including the multitrack tapes, two-track tapes, demo tapes, cassettes and "physical devices embodying performances made by a record producer at recording sessions," usually belong to the artist for whom or the record company, independent production company or distributed label for which the tapes are being made, and such artist, company or label is entitled to the physical possession of all tracks. But, as with most issues discussed in this article, this is a question that should be determined by contract. Where no written contract exists, a good general rule is that "he who pays for them owns them," and is entitled to physical possession — but each situation must be reviewed individually in its factual context. And the right of possession does not mean the "right to exploit."

C. Copyright in tracks.

If a record producer produces tracks on "spec," and thereafter sells them to a record company or other person or entity, such person or entity will own the copyright in the tracks as that record producer's "assignee." If a record producer produces tracks at the request of a record company or another, such record company or other person or entity will own the tracks as that record producer's "employee-for-hire." If a record producer is an "assignor" of a copyright, he can terminate his assignment under United States Copyright Law within the earlier of 35 years after the release of a record made from the tracks, or 40 years after the tracks are made. If a record producer is an "employee-for-hire," then he has no right of termination, and the employer will own the tracks. Generally, only record producers who sign an artist and produce the tracks on a "spec"

— the authors —

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basis, *i.e.* without any agreement with, or obligation to do so for, a record company, convey tracks by assignment and have a right of termination. All other record producers, whether producing for independent production companies, artists, distributed labels or record companies, are generally employees-for-hire.

D. Perpetual and exclusive exploitation of tracks.

Correlative to the question of ownership and possession is the issue of control over the exploitation of the tracks produced by a record producer. Typically, a record producer contract will provide that the record company exclusively and perpetually controls such tracks and the performances embodied in such tracks; may alter, change or "interpolate" such tracks; may (but does not have to) manufacture, sell, distribute and advertise records or other reproductions embodying such tracks in any medium (hence visual and nonvisual uses) or manner and on any label; and may publically perform the tracks. Paragraphs 4 and 5 of the Prototype Agreement (refer to the October 1981 issue) illustrate a typical grant of rights by a record producer to a record company respecting tracks produced by that record producer. (As a practical note, the purchasing or employing party usually prepares the first draft of any proposed record producer contract).

Because the rights to use and exploit tracks and records made from tracks are framed in very broad terms, a record producer should seek to limit the exercise by a record company of its rights to exploit and use the tracks produced by that record producer. Here are some of the limitations we like to include in a record producer's contract:

(1) Initial release on "top line" label.

Generally, a record producer expects that the record initially released by a record company which is made from his tracks will be on a "top line" or "top pop" label. Indeed, most records are initially produced for and released on such labels. However, record companies may vary their pricing policies for artists, and may initially release a record on any label it desires without a contractual requirement to release it on a top line or top pop label. If a record is not released initially on a top line or a top pop label, a record producer's reputation may suffer. Top record producers do not permit any releases on other than "top" labels without their prior permission.

(2) No engagement of other producers.

Some record companies will agree that the tracks of one record producer will not be coupled with the tracks of one or more other record producers on the initial release of a record. Others will agree that no other record producers will be engaged to alter or change the tracks produced by a record producer, unless that record producer is in breach of his record producer contract.

The issue of changing the tracks produced by a record producer is similar to that of "final cut" sought by movie directors. Few can get it, however, since they are subject to that old "golden rule;" namely "He who has the gold makes the rules."

Besides aesthetic considerations, the economic effect of other record producers working on tracks produced by a record producer may be significant. The royalties for any such tracks are "prorated," *i.e.* divided among all the record producers whose work is embodied on the tracks. Sections A.2 (g) and (h) of the second installment of this article (December 1981 issue) explain how royalties are prorated for joint recordings and coupled records.

(3) No re-recording, re-mixing, re-editing or re-sequencing of tracks.

Although a record producer is rarely granted the right to absolutely prevent any alterations or changes in a track, often he can negotiate a right to have the first opportunity to re-record, re-mix, re-edit or re-sequence tracks he has produced. In such cases, a record company would give a record producer notice of its desire to have a track re-recorded, re-mixed, re-edited or re-sequenced, and that record producer would then have to indicate his willingness, or lack of the same, within a fixed period of time, usually five to 10 days following the request, to render the requested service. In addition, a record producer would have to be ready to perform the requested task at the time a record company wants the task performed. Record companies usually limit re-editing or re-sequencing rights to the versions of the records released in the United States, and exclude re-editing or re-sequencing for singles (7- and 12-inch) and tape (cassette and eight-track).

(4) No "interpolation."

(a)Interpolation is the introduction of all or part of an existing, completed track into other musical material, or (b) the alteration or change of all or part of an existing, completed track by the introduction of other musical material into that track.

The economic and aesthetic consequences to a record producer of the interpolation of an existing, completed track are, respectively, the proration of royalties for the track, and a change in or alteration to the "art" of that record producer.

Most record producers do not want their work interpolated by or into other musical material. It would be a surprise to them to hear a rhythm track created for one song end up as a rhythm track for one or more other songs. Yet, some record companies are known to have interpolated a rhythm track with other musical material, and produced several hits from one such rhythm track!

Interpolation is a point that is not frequently negotiated. When it is, record companies argue that there should not be any restraints on their right to exploit a track to the maximum extent possible and that, in any event, interpolation is seldomly, if ever, practiced in today's recording industry. Most record producers do not concern themselves with the possibility of the occurrence of interpolation because the practice is not widespread. Nevertheless, interpolation does occur from time to time, and appropriate restraints should be imposed on a record company's right to so act.

(5) Mastering by record producer.

A record producer's contribution to the making of a record can be viewed to have ended when final, fully mixed, edited and leadered two-track tapes are completed. However, many record producers believe that the electrical transference of the electrical impulses on a tape to a lacquer, *i.e.* "mastering," is such an important aspect of the "sound" of a record that it requires their involvement. This belief is based on the idea that a record producer must be involved in the mastering process of a record in order to insure that the quality of recording that has been achieved on a tape will be carried over into the record manufacturing process.

Some record companies oppose the involvement of the record producer in the mastering process primarily because record producers sometimes prefer special mastering facilities over a record company's "in-house" facilities, thereby increasing the expense of a recording project. Even if a record producer is willing to master at a record company's "in-house" mastering facility, some record companies will refuse to permit him to do so, in the belief that a record producer is unnecessarily involving himself in an area of record "manufacturing" as opposed to "producing."

Sometimes a bargain can be struck and, in most cases, if a record producer is unable to master the record he has produced at a facility selected by him, he may nevertheless master the record at the mastering facility of the record company for which he has produced the tracks, with the assistance of the record company's mastering technician.

(6) Test pressings.

A "test pressing" is a positive mother which can be played on a turntable to check for audio quality. Record companies usually oppose a record producer's contractual right to evaluate test pressings, in the belief that a record producer is unnecessarily involving himself in an area of record "manufacturing" as opposed to "producing."

In order for a right to audition test pressings to be meaningful, a record company should be required to submit test pressings to a record producer from each record manufacturing plant of a record company, for the first album (including any singles) manufactured from the tracks that record producer has produced, until that record producer has approved a test pressing for each such manufacturing plant. In addition, the record company concerned must agree that, in the absence of that record producer's approval of the test pressing as to any given record manufacturing facility, it will not manufacture records from the tracks at that facility.

Record companies usually limit a record producer to one, or perhaps, two test pressings or, in lieu of granting an actual test-pressing approval, may agree to consult with a record producer about a test pressing following its submission to him. The rights that a record producer may acquire with respect to test pressings will depend on the bargaining power of that record producer.

E. Identification rights.

Generally, a record company acquires the right to use the name, likeness and biography of a record producer to sell and advertise the tracks he has produced. A typical provision is set forth in Paragraph 5 of the Prototype Agreement (October 1981 issue). While a record producer may wish his name, likeness and biography to be promoted along with the records manufactured from the tracks he has produced, appropriate safeguards must be incorporated into his record producer contract limiting the use of his "identification rights." A record producer's "identification" should be used only to sell records manufactured from tracks produced by that record producer, as opposed to a record company's "record business and products" — a vague but nevertheless standard phrase found in many record producer contracts. Moreover, even if a record producer's identification is used to sell records, it should not be done in a way which suggests that the record producer is endorsing a product or a religious belief or political practice. Finally, a record producer should have the right to approve any picture of, or biography about, him which may be publicly released.

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OUTSIDE THE STUDIO

A record producer may believe that he fully performs his contractual obligations to the owner or purchaser of a tape when he has produced an edited, sequenced and leadered two-track tape. However, there are other significant responsibilities and obligations a record producer may be required to undertake before he will have been deemed to have "delivered" the tape he has produced (refer to October 1981 issue).

A. Mechanical fees and licenses.

(1) Definition of mechanical fee and mechanical license.

"Mechanical fees," or "copyright royalties," are royalties which must be paid by record companies to those who control the musical compositions embodied in the records that such record companies manufacture, distribute and sell. "Mechanical licenses" are the contractual agreements that specify the amount of mechanical fees, or copyright royalties that will be paid.

(2) Controlled compositions.

Any musical composition which is written, owned or controlled by a record producer (or an artist), and recorded on the tracks that the record producer is producing, is customarily referred to as a "controlled composition," and usually must be licensed to the record company for which the record producer is producing, or to which the record producer is selling, tracks for the United States and Canada at certain copyright royalty rates. Paragraph 8 of the Prototype Agreement (October 1981 issue) contains a typical controlled composition provision.

As of July 1, 1981, the United States Copyright Royalty Tribunal raised the minimum statutory copyright royalty rate in the United States for a composition from 2¾ cents (or one-half cent per minute or fraction thereof, whichever is larger) to 4 cents (or three-quarters cents per minute or fraction thereof, which-ever is larger). Copyright royalty rates are negotiable, however, despite the statutory rates, and many record companies, claiming that the new United States statutory rate is too high, will attempt to pay only three-fourths of the 4-cent minimum rate, *i.e.* 3 cents.

If a record producer has written a controlled composition which is owned or controlled by a music publisher, that record producer must be sure that his publisher will issue a mechanical license for such controlled composition in conformance with any requirements in his record producer contract.

Moreover, if a record producer has written a "long" controlled composition, *i.e.* a controlled composition in excess of five minutes, neither he or his music publisher would probably want the minimum statutory copyright royalty rate of 4 cents, or the 3-cent rate to apply, but would obviously prefer the per minute rate provided by federal law.

In addition, a record company may also require that the copyright royalty rates in the record producer contract will be payable only for controlled compositions on records sold after "returns" (refer to December 1981 issue) have been deducted, and that no royalties will be payable for controlled compositions on "free goods" records. Some music publishers may refuse to license a composition pursuant to a license which provides for payment on less than all records distributed, such as payment only on records sold or payment of lesser royalties (usually one-half or three-fourths the full rate) on free goods records.

If a record producer or his music publisher refuses to issue a mechanical license at the copyright royalty rates specified in a record producer's contract, and otherwise on terms acceptable to the record company for which that record producer is producing tracks, that record company may refuse to accept the track embodying the controlled composition. In such event, such record company may claim that the record producer concerned is in default of his record producer contract. It may also claim that the record producer concerned has not "delivered" the required tracks, and is therefore not entitled to any unpaid portion of his advance against record royalties (at least one-half of an advance is frequently payable on the "delivery" of the tracks). It may also decide to engage another record producer to record another track embodying another composition. Thus, a record producer who records controlled compositions must be aware, at the time he enters into his record producer's contract, of the mechanical fee, or copyright royalty rate, being required by the record company for which he is producing tracks.

(3) Compositions written by others.

A record producer may also be required to procure the mechanical licenses for compositions written by others that are recorded on the tracks he is producing. Thus, he may be required to obtain mechanical licenses for *all* the compositions on a record for a combined mechanical fee, or at an aggregate copyright royalty rate, which does not exceed a "maximum aggregate copyright royalty rate." In other words, it may become a record producer's contractual responsibility to deliver tracks embodying compositions, including controlled compositions, which will not require the payment of copyright royalties in excess of the maximum agreed to be paid.

The current maximum aggregate copyright royalty rate is equal to forty cents for albums sold in the United States and 20 cents for albums sold in Canada, *i.e.* 10 times the current minimum copyright royalty rate being paid in the record industry in the United States and Canada, respectively, of 4 cents and 2 cents; although, as noted previously, many record companies seek — and are successful — at paying royalties for the United States at a rate equal to three-fourths of "statutory." The same ratio may apply to singles, with a record company attempting to pay 6 cents (instead of 8 cents) for singles sold in the United States, and 4 cents for singles sold in Canada.

The typical record producer contract provides that if a record company is required to pay an actual aggregate copyright royalty rate for an album or single which exceeds the maximum rates permitted in such contract, then that record company may deduct the excess from the copyright royalties that would otherwise be payable to that record producer or his music publisher for the controlled compositions on the track he is producing.

Thus, if a record producer, for example, agrees to provide controlled compositions at a rate which is three-fourths of "statutory," and produces an album containing 11 songs, including one song written by that record producer, *i.e.*, a controlled composition — but has contractually agreed to deliver an album whose mechanical fees would not exceed 30 cents — then that record producer, essentially, will waive his right to mechanical fees payable to him with respect to such album. Moreover, if the record company for which the record producer is producing the album cannot deduct the entire amount of the excess from the controlled composition, or if the record producer had no controlled compositions on the album, the record company could nevertheless deduct the excess from his advances against phonograph record royalties, or his phonograph record royalties for the album.

Most record producer contracts can be interpreted to provide that if the actual aggregate copyright royalty rate exceeds the maximum aggregate copyright royalty rate, a record producer may be deemed to have breached his record producer contract. If such a breach of that contract is considered "material," it permits a record company to terminate the record producer contract and suspend any further obligations to that record producer, including the payment of phonograph record royalties. This is far too harsh a remedy, and any language in a record producer contract which might be construed as permitting such a result should be limited or deleted. Additionally, failure to deliver tracks meeting copyright royalty rate requirements specified by contract should not be deemed to cause a breach, but rather should cause only the imposition of the penalties specified in the preceding paragraph.

Sometimes, a record producer is required to procure mechanical licenses for compositions (other than controlled compositions) on the record he is producing on terms no less favorable to the record company for which he is producing the tracks, than those contained in the then current standard mechanical license issued by the "Harry Fox Agency." (The Harry Fox Agency is a licensing agent which issues mechanical and synchronization licenses, and supervises the collections from record companies for many publishers). Curiously, the Harry Fox Agency denies it has a "standard form," so the aforesaid requirement is rather nonsensical.

Occasionally, a record producer contract may require a record producer to procure mechanical licenses for compositions on the same terms and conditions as those required for controlled compositions. Such a requirement should never be agreed to, because music publishers have no reason to issue mechanical licenses on the terms required by most record companies for controlled compositions.

A record producer should always attempt to limit his responsibility for obtaining mechanical licenses for compositions (other than controlled compositions). A record producer frequently does not have complete control over the selection of the musical compositions to be recorded. He may be limited to musical compositions which are written or selected by the artist he is producing. Often, a record company may participate in the selection of compositions. It seems unfair to require a record producer to procure mechanical licenses for compositions chosen by an artist or a record company. It also seems unfair to reduce the copyright royalties or phonograph record royalties payable to a record producer because such compositions are not licensed at the required copyright royalty rates.

(4) Public domain compositions.

A typical record producer contract usually provides that no copyright royalties will be payable for arrangements of selections in the public domain. If a record producer arranges and produces a public domain composition, that record producer should require the record company for which he is producing the tracks to pay him at a copyright royalty rate that would equal the percentage of the performance fees allocated to that arrangement by the performing rights society with which that record producer is affiliated.

B. Consents, approvals, permissions, licenses and materials.

. . . *continued overleaf* —

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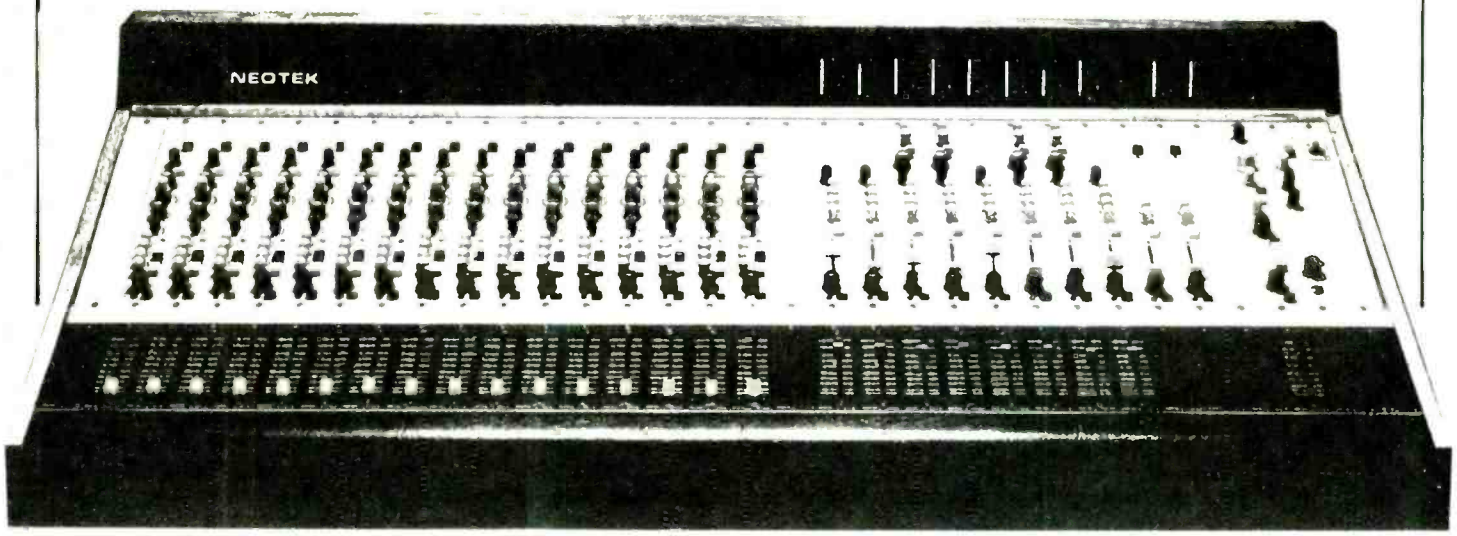

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A record producer's responsibility to obtain all consents, approvals, permissions, licenses and other materials required by a record company to "release records and to manufacture album covers and other packaging" has been discussed earlier in Section C.2 of the first installment of this article (October 1981 issue). Often, tracks are not deemed "delivered" unless a record producer has furnished:

(a) Any and all consents to record, executed by the record company concerned, for any sidepersons, background vocalists and artists;

(b) All label copy information with respect to the tracks that have been produced including, but not necessarily limited to, the title, timing, writer and publisher of the compositions produced;

(c) Any and all credits which will be contained on the record or its packaging, including, but not limited to, credits for the artist, musicians, sidepersons, background vocalists, engineers, co-producers, mixers, re-mixers, re-recorders, their respective assistants and other persons who are required by contract, or who are otherwise entitled, to receive credit; and

(d) Any and all mechanical licenses and other consents and permissions to record selections, including any waivers of any re-recording restrictions.

All or part of a record producer's advance usually is conditioned upon the "delivery" of the tracks he is producing, plus all or part of the items specified above and, accordingly, a record company's obligation to pay an advance to a record producer may be delayed or prevented if the tracks and the required items are not supplied to that record company.

Most record companies refuse to limit a record producer's responsibilities for obtaining consents, approvals, permissions, licenses and information, even though record companies and artists usually play a greater role in obtaining such items than record producers. The compositions to be recorded, for example, are usually mutually approved by the record company and artist involved in the recording project, and the publishers of such compositions are usually known to such record company or artist. The length of the compositions being recorded may or may not be jotted down on the tape containers delivered by a record producer but, in any event, can be ascertained by any listener in a record company's A&R department.

Consents to record for sidepersons, background vocalists and other artists rendering performances on tracks are, in most cases, granted after the fact, *i.e.* a record company is advised of the performance and obtains the consent for such performance after the date of its rendition. Record companies, as a matter of courtesy, usually grant such consents routinely, provided they and the sideperson, background vocalist or artist receive an appropriate credit for such performance on the packaging of the record manufactured from the track on which the performance is rendered. Often, a record company's legal department or counsel handles such consents after being advised about it by an artist, a member of the record company's A&R department, or the other record company involved. In addition, it is unlikely that a record producer could obtain all of the necessary consents, permissions, approvals, licenses and information without going to considerable effort prior to the commencement of recording sessions for a project.

It is important, therefore, for a record producer to determine in advance what his responsibilities are for consents, approvals, permissions, licenses and materials so that the "delivery" requirement in his record producer contract will not unreasonably or unnecessarily burden him with requirements that he cannot perform.

C. Materials furnished or selected by record producer.

A record producer is usually required to promise in a record producer contract that any "materials" furnished or selected by him and used by a record company will not violate any law or infringe upon or violate the rights of any person. He also usually promises to reimburse a record company for any costs or expenses it has incurred as a result of such violation or infringement. Therefore, it is important that a record producer be aware of materials which he is "furnishing" or "selecting," and for which he may be held financially responsible.

"Materials," as used in paragraph 9 of the Prototype Agreement, refers to the tracks, compositions, artwork and credits and any and all other musical, dramatic, artistic and literary ideas, sounds or intellectual properties which are contained in the tracks, used with the tracks or in the packaging, sale, distribution, advertising, publicizing or other exploitation of the tracks or "derivatives" of the tracks, such as phonograph records.

While such a definition of "materials" is very broad, the main areas of concern to a record producer are the avoiding of obscenities and/or libelous statements, the violation of re-recording restrictions (see Section 4 below), or the causing of a copyright infringement.

In most cases, because he is neither the author of, nor the person primarily responsible for selecting, a composition, a record producer has little opportunity to determine whether or not a track may contain libelous material, violate a re-recording restriction, or infringe a copyright. A record producer should always attempt to limit his responsibility for such matters to materials which he has personally selected or furnished. This can be accomplished by requiring a record company to agree that "materials" are not furnished or selected by a record producer if that record producer shall have chosen such materials from materials initially furnished by the record company or the artist.

D. Re-recording restrictions.

A re-recording restriction is a promise by a record producer to a record company that such record producer will not, for a certain period of time, usually two to five years, re-record for anyone else, a composition that he has produced for that record company using the particular artist he has produced for that record company without such record company's consent. A record producer also usually promises that he will not, for a period of time, usually one to two years, use any other artist to re-record a composition he has produced for a record company without that record company's consent.

The length of time a re-recording restriction may run may be shortened by negotiation to one to three years, in the case of the particular artist a record producer has produced, and six to 18 months, in the case of any other artist. The

actual length of time of a re-recording restriction, however, will depend upon the date or event from which the re-recording restrictions runs. Thus, a record producer should be certain that the "time clock" on a re-recording restriction is running soon after a track is produced. Section 9E of the Prototype Agreement, for example, provides that the re-recording restriction runs from five years after the date of the agreement, or after the recording of the tracks, whichever is later.

While the length of time involved *i.e.* five years, constitutes a long re-recording restriction, a record producer bound by such a provision would know that five years after the later of the two dates, the re-recording restriction will expire. However, if the re-recording restriction runs for five years from the "initial release of the recording in a record," or the end of the "term of the record producer contract," then the actual length of the re-recording restriction can be significantly longer than the stated number of years.

There is a well-known record producer, for example, who wrote, produced and recorded a hit song as a member of a group. Years later, he was asked to produce the composition, using another artist, for a motion picture soundtrack. The record producer also intended to record the composition the following year for his own debut solo album. The re-recording restriction in the record producer contract for the motion picture soundtrack album ran one year from the "date of release of the picture," which was scheduled to be released several months after the completion of the soundtrack album. Since, however, the possibility existed that the picture might not be released on schedule, or at all, a question arose as to when the record producer would be able to record the composition for his debut solo album, which was slated to commence production within six to eight months following completion of the recording for the soundtrack. The matter was resolved by tying the re-recording restriction to the delivery of a two-track tape of the composition.

CREDIT

A. Purpose of credit.

A credit for work done is an important aspect of the career of almost any creative person in the entertainment industries. A credit furthers one's reputation and standing with the public and in the artistic community; it also represents free advertising and an indication that one is a "professional." A credit in the record industry identifies a record producer as the producer of the tracks for which the credit is given, and thereby apprises the record industry of the skills and abilities of that record producer.

B. Credit on Records and Tapes.

(1) The "appropriate producer's credit."

Most record producer contracts provide for an "appropriate producer's credit." Paragraph 5 of the Prototype Agreement (See October 1981 issue) is a typical "appropriate producer's credit" provision.

(a). Definition.

A provision for an "appropriate producer's credit" in a record producer contract means that a record producer will receive credit only on the liners of albums solely manufactured from the tracks that record producer produced, and initially released by a record company for sale in the United States. An appropriate producer's credit, such as the one specified, inadequately protects a record producer in a number of ways with respect to the credit to which he may be entitled on records and tape.

(b). Credit on records initially released.

First, an appropriate producer's credit fails to afford credit to a record producer on the initial release of records which are not "solely" manufactured from tracks produced by that record producer. Thus, if a record company engages more than one record producer to produce tracks for a record, or engages a record producer to re-mix, re-edit or otherwise alter or change a track produced by another record producer, no record producer whose work is on a record manufactured from such tracks would be entitled to receive credit. This result can be avoided by requiring a record company to give a record producer credit on the initial release of the album (and single) manufactured from the tracks produced by a record producer, regardless of the number of other record producers whose work is on the record.

(c). Credit on subsequent releases.

Second, the appropriate producer's credit fails to afford credit to a record producer on subsequent releases of records manufactured from the tracks produced by that record producer. Thus, a record producer is not entitled to receive credit on a "re-issue" record, a soundtrack record which borrows a track from a previously released record or a "compilation" record, such as a "greatest hits" or a "best of" record.

Record companies frequently refuse to agree to afford credit to a record producer on subsequent releases of records. The record companies argue that it is administratively difficult to review various record producer's contracts to see what language is required for a particular record producer's credit. They also claim that space limitations make it difficult to credit all producers involved in a compilation album or soundtrack album on the labels and liners of, or in the advertising for, such albums. However, a record company could afford to give all record producers a standard "short form" credit such as "Produced by . . . " on a subsequent release of a record, without causing itself any such administrative burden or taking up too much space on labels, liners and advertising for such records.

(d). Credit on all configurations.

Third, the appropriate producer's credit fails to afford credit to a record producer on all configurations of a record.

A record producer should receive credit on singles, both 7-inch and 12-inch; tape, both cassette and eight-track, and any audio-visual record, such as video tapes and video disks, in addition to receiving credit on an album.

Record companies are reluctant to agree to afford credit on singles, cassette and eight-track tapes and audio-visual records, because of the limited amount of space available on such records or tapes, or on the packaging for such records or tapes, for credit. However, many top record producers require record companies to afford them credit on such records and tapes. In addition, a "short form" credit could be used, such as the credit suggested for subsequent releases of a record, which would use only a minimum amount of space.

Credit in tape configurations, particularly cassette tapes, is becoming increasingly important as cassette tapes garner an increasingly greater share of the record market.

(e). Size of type, frequency and location of credit.

Fourth, the appropriate producer's credit fails to afford credit to a record producer in a specific size of type, a specific number of times, or in specific locations on a record or its packaging.

Typically, the "appropriate producer's credit" will appear once in a size of type, as large or greater than the credits afforded to sidepersons or technical personnel, in the liner notes on a record jacket. In addition, a record producer may receive credit on the cover of a motion picture soundtrack album if he is also the composer of the music.

Since the reputations of record producers differ, it seems that the size of type, frequency and location of their credits should also differ, just as such requirements do, for example, for directors in the motion picture and television industries. However, while top record producers occasionally may demand and receive credit for a record, which is large and prominent and frequent, the size of type, and the frequency and location of credits afforded most record producers on records is surprisingly uniform throughout the record industry. However, there is no reason why such aspects of credit should not be based on the stature and bargaining power of the record producer concerned. Thus, a record producer should attempt to negotiate a minimum size of type for his credit on a record, measured against, perhaps, the title of the record or the name of the artist on the cover. In addition, a record producer should attempt to negotiate a credit on the liner, label and cover of a record, or an "artwork" sleeve or on a poster or other inserted material. Moreover, a record producer should also attempt to negotiate a prominent location of his credit on such liner, label, cover, sleeve or insert.

A record producer should require, at a minimum, that a credit be afforded to him on the label *and* the liner notes of disk records initially manufactured from the tracks he produces.

(f). Credit on records released outside the United States.

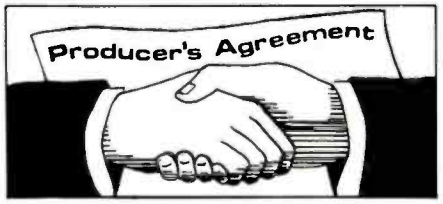
Fifth, the appropriate producer's credit fails to afford a record producer credit on records released outside the United States. An International hit record, however, can be just as, or more, instrumental in boosting the career of a record producer than a "Stateside" hit.

Most United States record companies refuse, but can require the foreign record companies releasing their records, to afford credit to a record producer. Most records recorded in the United States which are released outside the United States, are released by companies affiliated with, owned by or licensees of the United States record companies that recorded such records in the United States. Generally, agreements for the foreign release of a record specify in great detail the obligations of the affiliated, owned or licensee foreign record company linked to the United States record company involved. Most such agreements require that the foreign record companies utilize precisely the same artwork (including the exact credits afforded persons who performed or rendered services) on a record that the United States record company uses. Often, such artwork is supplied by the United States record companies to the foreign record companies.

(g). Credit wording.

Sixth, the appropriate producer's credit does not permit a record producer to word a credit in the manner in which he may wish such credit to read.

Space limitations on labels and jackets and in advertising for a record are one obvious limit on the wording of a credit for a record producer. However, a record producer may have a legitimate business purpose for wanting his credit worded a certain way. Some record producers, for example, furnish their services as record producers through loan-out companies, or produce artists under a "dba." They want their loan-out company or dba to be identified in the



credit provision by a credit such as "Produced by . . . for . . . Productions" because it is the way they identify themselves in the industry in which they work.

One solution — previously offered for subsequent releases — is the use of "short form" credits; a list of credits acceptably worded to a record company and a record producer, and which takes into account the legitimate business purposes of record producers. From these short form credits a record producer may select his credit.

(h). Credit in advertising.

Seventh, the appropriate producer's credit fails to afford credit to a record producer in advertising concerning the record manufactured from the tracks produced by that record producer (see section 3 below).

(2) Special credits.

A record producer may want to contractually limit or control the credits a record company may afford to other persons who assist in producing tracks for a record. Most record producer contracts do not give a record producer the right to limit or control the credits of such other persons. However, a record producer should attempt to negotiate limits or controls because of the proliferation of "special credits" such as "recorded by," "in association with . . ." and "executive producer," and because of the increasing number of people and places being afforded credit. Such credits may diminish the significance of a record producer's credit. Consider, for example, the following list of 18 credits, all the same size and printed on the liner of the first album of an artist recording for a major label, which contained the only mention of the record producer's name:

Produced by A & B for C Productions; Tracks recorded by D at (Name of studio), assisted by E; (Name of Song) recorded at (Name of studio) by F, assisted by G & H; Additional recording by I, J and K at (Name of studio), assisted by L at (Name of studio), assisted by M; Mixed by N at (Name of studio), assisted by O; Mastered by P at (Name of record company); Strings arranged and conducted by Q, contracted by R.

Of course, a production service rendered by another person on a recording project may merit credit. However, if such credits are to be given, it should be an item of negotiation at the time a record producer's contract is entered into and not a surprise to a record producer at the time he reads the liner notes of a record manufactured from the tracks he produced at a record store.

Top record producers are sometimes granted approval of the artwork for the album of the record of an artist for which tracks are being produced. Such right of approval permits them to determine the exact credits that will be afforded to all parties who have rendered services on a project.

(3) "Phantom" credits.

A "phantom credit" is a credit given to a person who may have rendered a service on the tracks from which a record is manufactured, but not the service for which he receives credit on the record.

Phantom credits are another reason for contractually limiting or controlling the credits a record company may afford to other persons who assist in producing a record. There is a well-known record producer, for example, who recently produced a well-known artist for a major record company. After the project was completed, the record producer was advised by the record company that the engineer on the tracks would be afforded credit as the record producer's "co-producer" on the album. The engineer had recently produced his first album, which was released by the record company. A co-producer credit was afforded the engineer, over the objections of the record producer, because the engineer agreed to engineer the project for a low fee, and as a "reward" for the chart success the record company had with his first album.

C. Credit in advertising.

Records are advertised primarily in magazines and newspapers ("print" advertising), and by radio and television.

(1) Print advertising.

Print advertising for records is usually placed in trade magazines, such as *Billboard,* consumer magazines, such as *Rolling Stone,* and general circulation newspapers.

(a) Trade publication advertisements.

Trade publication advertisements inform the record industry — a record producer's chief employer — that a particular record producer is responsible for producing a particular record. Most record companies will agree to afford credit to a record producer in trade advertisements placed for a record if requested to do so, provided such advertisements are no less than a certain size [see section (d) below].

(b). Consumer publication advertisements.

Consumer publication advertisements build a record producer's "public" reputation by stimulating reviews of and discussions about a record, including the work performed by that record producer. In addition, many members of the record industry read consumer magazines that cover music matters, including advertisements for particular records. Most record companies refuse to afford credit to record producers in consumer publication advertising. Where such credit is afforded, it is limited to advertisements that are no less than a certain size [see section (d) below].

(c) Billboards.

Most record companies refuse to afford credit to a record producer in billboard advertisements. They argue that billboard advertisements are "ego boosters" for the artist whose record is being advertised on the billboard, and have little effect on sales. As a practical matter, the use of billboards for phonograph record advertising is not substantial, and seems to be limited primarily to Los Angeles and New York. Thus, it is not a serious problem in the negotiation of a record producer contract. In addition, artists whose records are advertised on billboards generally engage record producers who can demand such credit. Nevertheless, a record producer should attempt to negotiate a credit in billboard advertising, if he has reason to believe that billboard advertising might be included in the advertising campaign for the record of the artist that he is producing; he wants to boost his own ego, or he has the bargaining power to demand and receive such credit.

(d) Size of advertisement.

If a record company agrees to afford a record producer credit in consumer or trade publication advertising, it may limit its responsibility to do so to half-page or full-page advertisements. Such a limitation may preclude a record producer from receiving credit in most of the print

advertising placed for a particular record if full-page and half-page advertisements are not utilized. Nevertheless, most record companies refuse to afford credit to a record producer in advertisements which are smaller than a half page in size.

(e) Size of type, frequency and location of credit.

Most record producer contracts do not contain size of type, frequency or location requirements for credit in print advertisements, and most record companies would refuse to agree to any such requirements. In addition, no standards for such requirements have been established in the record industry. Thus, for example, if a record company were to agree that a record producer's credit would be a percentage of the title of a record or the name of an artist, on the cover, what percentage should it be? Size of type requirements in advertising, however, are common in the motion picture and television industries and such requirements, for the reasons set forth in Credits Section B.1(e) above, would also be appropriate in the record industry. Record producers should attempt to develop standards by negotiating such requirements with record companies. Credit could be afforded to a record producer, for example, in a size of type which is not less than a percentage of the larger of the size of type used for the title of the record manufactured from the tracks produced by that record producer, the name of the artist, or the largest letters used in the advertisement. Such credit could be required to be located in a "prominent" place in the advertisement, or immediately below the title of the record or the name of the artist.

(2) Radio and television advertising.

Generally, record producers are not afforded credit in radio (and other "narrative") advertising or television advertising. However, a record producer should attempt to negotiate credit in advertisements placed in such media for records manufactured from the tracks he has produced, because it is probable that phonograph record advertising in these media will increase.

(3) Excluded advertising.

There are certain forms of advertising for which credit, by custom and practice, is not afforded to a record producer. These include artist congratulatory advertisements, such as advertisements congratulating an artist for winning a "Grammy," or honoring an artist with a special award for sales; group or artist advertisements, such as advertisements advertising a record company's new releases, or institutional advertisements, such as advertisements which promote a record company's achievements.

While such exclusions are reasonable, they should not be applied by a record company arbitrarily. Thus, a record producer should receive credit for a record in a group or list advertisement, if any other record producer has received such a credit.

In addition, record producers should attempt to negotiate congratulatory advertisements for record producers in trade publications. Such advertisements could have a strong impact. They could be triggered by the achievement of a certain level of sales of the record manufactured from the tracks produced by a record producer.

(4) Credit for non-phonograph uses of tracks.

A record company has the right to license the tracks produced by a record producer for "non-phonograph record purposes," such as a film soundtrack, or an audio-visual device. Most record companies, however, would not be willing to agree to afford credit to a record producer for a non-phonograph record use of a track, such as a film soundtrack. Such record companies would argue that the administrative burden of determining which record producers are contractually entitled to such credit would be too burdensome. They would also argue that they cannot agree, in a record producer contract, to afford such credit prior to obtaining the agreement to do so from a licensee.

Nevertheless, a record producer should attempt to negotiate credit for non-phonograph record uses of tracks produced by him. A credit in a film, for example, could be an important credit for a record producer. Such credits will become increasingly important with the growth of the home video and cable industries, and as new audio-visual devices are marketed.

D. Who affords credit.

A record producer may be promised a credit by a record distribution company (such as Warner Brothers), an independent production company, an artist, or a distributed label. However, the responsibility of affording credit to a record producer generally belongs to a record distribution company, the entity that usually manufactures the records and packaging on which, and places the advertisements in which, a record producer's credit will appear. Even if an independent production company, artist or distributed label agrees, in a record producer contract, to cause a record distribution company to give a record producer credit, the record distribution company is not a party to that contract, and is not contractually obligated to honor the promise of credit by the independent production company, artist, or distributed label to the record producer. It is the record distribution company which must agree in a contract to afford credit to a record producer for a record.

If a record producer is negotiating a record producer contract with an independent production company, artist, or a distributed label, he should require the record distribution company with which the independent production company, artist or distributed label has contracted, to become a party to the record producer contract, thereby obligating itself to perform the provisions respecting credit. Alternatively, the record distribution company could become a party to a separate agreement with such record producer, in which it agrees that it will honor the credit obligations of the independent production company, artist or distributed label to such record producer.

E. Failure to afford credit.

Most record producer contracts limit a record producer to an action for money damages if a record company fails to afford a record producer credit, or if it affords a record producer an incorrect credit. Thus, a record producer cannot "enjoin" (*i.e.* prevent), the distribution of, or compel a company or artist to afford a credit on, a record because he has not received the credit he was promised.

Money damages are, in effect, no remedy at all for a record producer. The harm, in dollars and cents, caused by the breach of a credit provision would be extremely difficult to prove, and a lawsuit would be expensive to bring and maintain. Moreover, a lawsuit for money damages takes years to reach trial, and thus is unlikely to quickly achieve what a record producer wants —credit for the tracks he has produced.

In addition, many record producer contracts provide that a "casual or inadvertent failure" to afford credit, such as a failure due to a mistake in printing labels or in preparing artwork, is not a breach of contract.

A record producer who is negotiating a record producer contract containing such provisions should attempt to require the record company with which he is negotiating to agree to cure any credit mistakes "prospectively," *i.e.* on all pressings of, and in all advertisements concerning, a record as applicable, immediately subsequent to the earlier of the date that record company discovers, or is notified of, its error.

MISCELLANEOUS

A. Promotional copies.

A record producer may wish to have made available to him copies of the album he produces for promotional purposes. He may also want to obtain other configurations of the recordings, such as singles, both 7-inch and 12-inch, prerecorded tapes, and other promotional material, such as posters and buttons. Most record companies will agree to provide such materials to the producer if requested. However, the terms on which such materials will be supplied to a record producer are subject to negotiation. Usually, a record producer will be limited to "reasonable" numbers of the material requested. What is "reasonable" will vary with the circumstances. Five hundred copies each of albums, singles and tapes would probably be unreasonable, even in the case of a Platinum act. Fifty copies each of albums, singles and tapes would probably be reasonable in most cases. Most record producers would be required to pay for such amounts or any copies ordered; agree that there would be no royalties payable on any such records supplied to them for promotional purposes; and acknowledge that they would not resell the record or other materials supplied them.

B. Performance royalty.

Presently United States copyright law does not recognize "public performance rights" in sound recordings, including the rights of performers, record producers, or both, to be paid for public performances, broadcasts and transmissions of their recording. However, many other countries pay fees for the right to broadcast recordings, as opposed to the copyrighted compositions embodied in such recordings. Generally, however, foreign record companies do collect such fees from foreign users.

To the extent that public performance royalties for a record are being collected by licensees or affiliated or related foreign record companies of a United States record company, the United States record company should be contractually required to allocate a portion of the public performance monies to the record producer who produced the record. However, most record producers are unaware of this source of income, and consequently most record producer contracts do not provide for a portion of such monies to be paid to the applicable record producer.

Generally, if a record producer requests a record company to insert a provision in his record producer contract in regard to public performance royalties, that record company will usually agree to allocate a portion of such royalties to him.

Most of the typical provisions provide that the record company will "credit" a record producer's royalty account with the sum agreed to be allocated, as opposed to providing that such record company will pay such sum to a record producer. Such language permits a record company to "cross collateralize" public performance royalties against phonograph record royalty advances paid to a record producer, penalties or other costs chargeable against such record producer's royalty account. This result can be avoided by a specific prohibition against such cross collateralization. ■■■

New Products

AUDIO+DESIGN ANNOUNCES MODEL F601 SUPER-DYNAMIC LIMITER

The new F601 Super-dynamic has been engineered to meet the challenge of the digital era. Sixteen-bit PCM systems can provide a dynamic range in excess of 90 dB, but when headroom and what might be called "low-level granular distortion" are taken into account, the range is not so generous after all, ADR claims. PCM inputs are very sensitive to overload; a transient limiter that more than matches the dynamic performance of the 16-bit system will allow maximum modulation of the system without fear of overload, while ensuring that wanted low-level signal is well clear of the digital distortion range.

The F601 is described as more than meeting this requirement with a dynamic range in excess of 100 dB referred to optimum limit threshold. In addition to the role of PCM input protector, the system is designed as a unity gain limiter for mastering and disk cutting; for transmitter protection (TV, FM and AM), where optional output filtering is also available; and also for voice-over applications.

Using the proven Audio + Design limiter/clipper function, the limit threshold is always pre-set relative to the clipper operating level (if switched in). Clipping of the fastest transients is said to be inaudible, and has the advantage that the overall program is not unnecessarily modulated on every fast peak (a delay-line limiter will modulate program to a greater extent, as every excursion has to be attenuated and held at threshold level).

The Super-dynamic is 19-inch rack-mounting, and 1 unit high. Function modes are controlled by digital logic momentary switches (through high-level CMOS); when switched off, the CMOS retains "last settings" so that when re-powered, the system behaves as with conventional switches.

The F601 Super-dynamic is available as a dual mono/stereo package priced at $1,490; and as a mono package priced at $990.

AUDIO+DESIGN RECORDING, INC.
P.O. BOX 768
BREMERTON, WA 98310
(206) 275-5009
For additional information circle #63

VERSATILE MULTI-CHANNEL PARAMETRIC EQUALIZER FROM DAN DUGAN SOUND

The FX Series equalizers provide an economical means of correcting tape recorder "head bumps" and other frequency response errors which degrade the quality of master tapes. Other applications include cascading two channels in series to equalize a studio monitor, thereby providing six parametric filters in each channel. The equalizers may also be used in theatre applications where fool-proof equalization is desired for individual mikes or elements in a speaker cluster.

The equalizers pack 8 channels of 3-band parametric EQ into a single rack unit of space. Each band has frequency, bandwidth and amplitude trimmers. The frequency tuning ranges in each channel are 23 to 500 Hz, 45 Hz to 1 kHz, and 1 to 21 kHz. Typically, the equalization settings are tuned during tape recorder maintenance and protected from tampering by being inside the cabinet; the unit's front panel features only the power switch and a bypass switch.

Several models are available for various applications, including 8-channel, 4-channel and 4-channel/2-speed. The 8-channel unit has a pro-net price of $1,097.

DAN DUGAN SOUND DESIGN
833 14TH STREET
SAN FRANCISCO, CA 94114
(415) 621-0781
For additional information circle #64

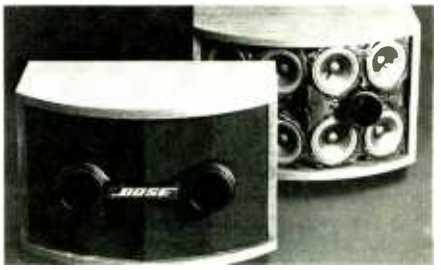
BOSE INTRODUCES NEW 802-W LOUDSPEAKER

According to Roy Komack, Bose Professional Products Manager, the new 802-W Articulated Array™ Loudspeaker is uniquely engineered to meet the needs of sound contractors and audio system designers. "Our goal was to produce a superior alternative to conventional columns and multi-way speaker systems that is easy to install and easy to use," Komack said. "We achieved this in two ways.

"First, we applied our patented transducer technology to a full-range system that combines uniform room coverage with outstanding smoothness of response and high power handling capacity. This greatly simplifies system design by eliminating complex horn and bass cabinet clusters.

"Second, we developed a compact walnut-grain vinyl enclosure that is ideal for installations requiring small size and a minimum of front-to-back depth. The planar cabinet design makes it easy to stack or splay the speakers in any configuration. This allows accurate control of coverage, bass response and intelligibility in a wide range of acoustic environments."

Each 802-W Loudspeaker contains eight Bose D-11A full-range drivers, mounted in vertical pairs on a faceted 3-dimensional baffle. This advanced Articulated Array system is said to provide exceptionally smooth horizontal and vertical dispersion, virtually eliminating hot or dull spots.

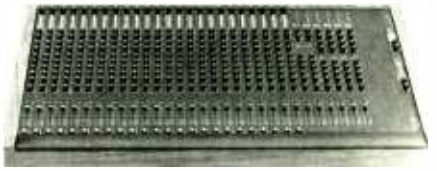


Like other Bose Professional Loudspeakers, proper frequency response is assured by the use of matched electronic equalization. The 802-E Active Equalizer eliminates the coloration caused by passive crossover networks, providing smooth spectral response across the entire operating range of the system.

BOSE CORPORATION
THE MOUNTAIN
FRAMINGHAM, MA 01701
(617) 879-7330
For additional information circle #65

WAVE 40 SERIES OF MODULAR MIXING CONSOLES

The new Wave 40 recording and sound-reinforcement consoles are expandable from 1 to 32 inputs and 1 to 4 outputs, with a total of 10 balanced outputs. Mainframe sizes are 16, 24, and 32.

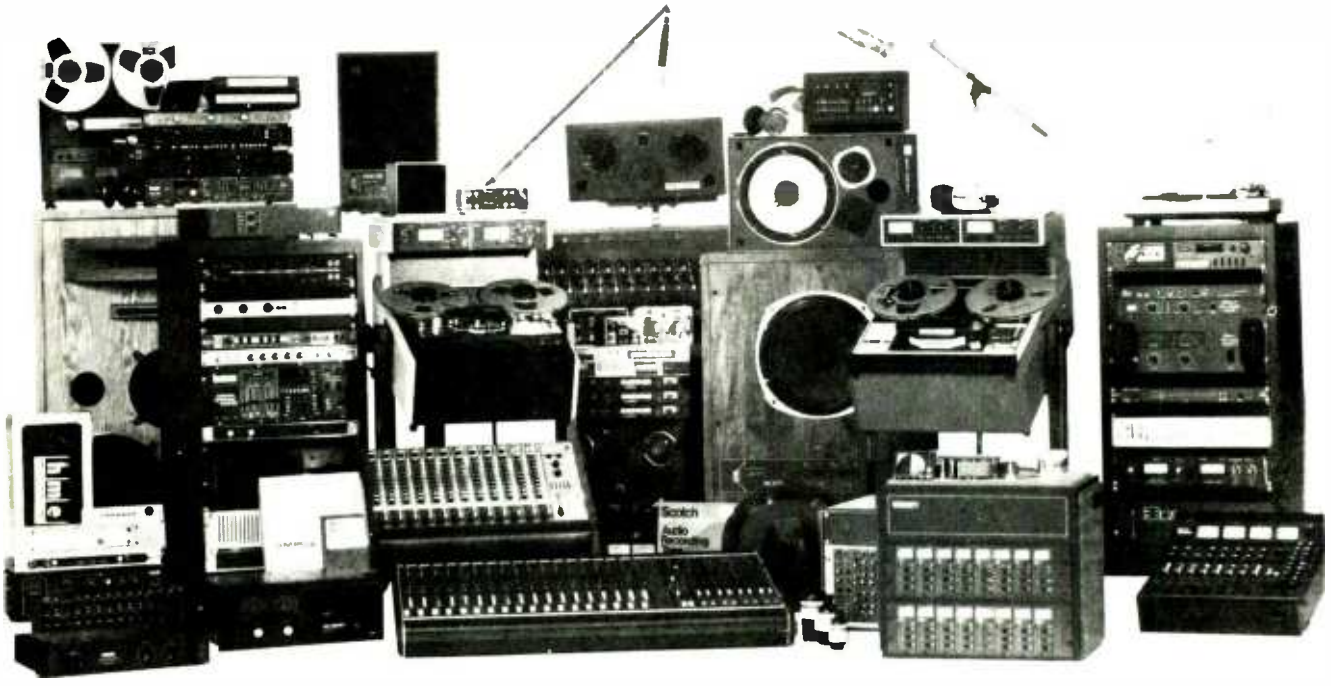


Each module features transformerless balanced mike inputs, and a three-level LED meter. Any module can be removed and replaced in only minutes with a screwdriver.

Frequency response is a quoted 20 Hz to 20 kHz, ±0.5 dB, and equivalent input noise -129 dBV.

The Wave 80 Series console is similar

Westlake Audio
The Professionals Choice



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Westlake Audio

Professional Audio Sales Group
7265 Santa Monica Boulevard
Los Angeles California 90046
(213) 851-9800 Telex 698645

New Products

to the 40 Series, but offers 1 to 8 outputs with a total of 18 balanced outputs; EQ in/out switch; choice of EQ on all inputs (5-band graphic, or optional 2-band quasi-parametric with 10 kHz shelving control); and optional slate and line-up oscillator.

The new Wave Monitor Series console is also totally modular, and expandable from 1 to 32 inputs. Features include transformerless balanced mike inputs; four aux groups for sub-mix; eight independent monitor mix outputs; and selectable headphone monitoring of any input, aux group or output.

WALKER AUDIO VISUAL ENGINEERING
P.O. BOX 5723
SAN BERNARDINO, CA 92412
(714) 884-1294
For additional information circle #67

FURMAN SOUND SG-10 SWEEP GRAPHIC EQUALIZER

Built expressly to provide greater tonal control than ordinary fixed-frequency graphics, the new SG-10 features 10 bands of 15 dB boost/cut graphic EQ, each band's center frequency being continuously variable over a four-octave range.

The SG-10 features unique "Stereo/Split" circuitry that enables the user to instantly change from 10-band mono operation to 5-band stereo operation. Also included are integral instrument pre-amplifiers to allow direct connection between low-level sources (guitars, bass, passive keyboards, high impedance microphones, etc.) and power amplifiers; sophisticated overload indicators which monitor all critical points for possible overload; bypass switches with LED status indicators; high-pass filters for each channel; and low-level outputs for driving instrument amplifiers. Balanced inputs and outputs are available as an option.

Suggested list price is $495.00.

FURMAN SOUND, INC.
30 RICH STREET
GREENBRAE, CA 94904
(415) 927-1225
For additional information circle #68

TELEX EXPANDS WIRELESS MICROPHONE LINE

The two new handheld VHF microphones — Models WHM-300 and WHM-400 — both feature transmitter and compressor circuits built into the microphone housing. This housing also serves as the omnidirectional transmitting antenna, so there are no unsightly wires protruding to distract from the tapered appearance of the microphone.

A 30 dB compression circuit provides maximal signal-to-noise ratio and dynamic range, and also prevents over modulation. Frequency response for either model is given as 50 Hz to 15 kHz.

The new microphones are specifically designed to work with the Telex FMR-1 dual diversity receivers. Both models carry a suggested pro-net price of $425.00

Model WHM-300 is a cardioid electret mike with flat response, and is said to be exceptionally well suited for the speaking voice. It is equipped with separate switches for RF and audio, enabling the latter to be turned off without losing control of the RF carrier.

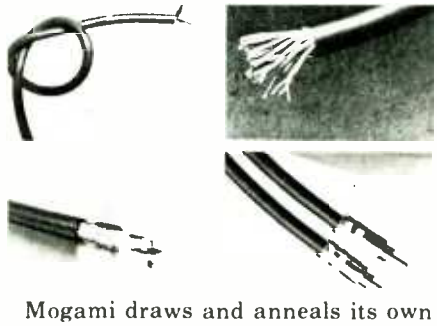
Model WHM-400 is a cardioid dynamic microphone with slight emphasis in the lower audio frequencies for the rich, full-bodied tonal quality preferred by singers, vocal groups and other entertainers. No switches are provided on this model to prevent the user from inadvertently turning off the mike; RF power is shut off by removal of the batteries.

The microphones are FCC-type accepted and are available in three transmitter groups: Standard group 1; Standard group 2; and a special frequency group at any desired frequency in the 150 to 176 MHz band.

TELEX COMMUNICATIONS, INC.
9600 ALDRICH AVENUE, S.
MINNEAPOLIS, MN 55420
(612) 884-4051
For additional information circle #69

MOGAMI INTRODUCES COMPLETE LINE OF HIGH DEFINITION AUDIO CABLES

The Neglex line of superflexible, high-definition audio cable for microphone, multi-conductor, interconnect and speaker applications has been developed for the highest quality recording applications, such as direct-to-disk and digital recording.



Mogami draws and anneals its own copper to control the purity and resiliency of the material which, in combination with other special proprietary

materials and construction methods, is said to increase the audible clarity of complex musical information. High-grade insulation material, consisting of polyethelene and cross-link polyethelene, are designed to minimize heat shrinkage during soldering, which allows easy termination to XLR-type connectors.

Included in the new Neglex Series are two-conductor balanced mike cable; quad hum-bucking balanced mike cables; 4- thru 42-pair multi conductor balanced cables with individual jacketed and shielded pairs; and various types of unbalanced interconnect and speaker cable. Also available are miniature cable for magnetic heads and tone arms.

MOGAMI PRODUCTS DIVISION
MARSHALL ELECTRONICS
P.O. BOX 2027
CULVER CITY, CA 90230
(213) 836-4288

For additional information circle #70

COMMUNITY INTRODUCES M4 MIDRANGE COMPRESSION LOUDSPEAKER

The Community Light & Sound Model M4 is designed specifically for the midrange decade, 200 Hz to 2 kHz. As the midrange component of a three-way or multi-way loudspeaker system, M4 fills in the "missing midrange" above 200 Hz where the power response of 15- and 18-inch loudspeakers begins to fall off.

By allowing a mid/high crossover point of 2 kHz, M4 may increase the power capacity of the high-frequency compression driver. By moving crossover points out of the midrange, M4 puts the fundamental frequency range of most musical instruments and of the human voice in a single transducer.

At 100 acoustic watts, M4 is said to offer unequalled SPL capabilities for voice-only systems. Because of its extremely low distortion, M4 is ideal for high-quality sound reinforcement and playback systems.

The Model M4 has a 9.6-inch diameter magnet, a 4.5-inch diameter voice-coil, a 7-inch diameter, aluminum-skin/foam-core sandwich diaphragm, and a 4-inch throat opening.

Suggested retail price of M4 is $949.00.

COMMUNITY LIGHT & SOUND
5701 GRAYS AVENUE
PHILADELPHIA, PA 19143
(215) 727-0900

For additional information circle #71

LOFT MODEL 403-M ELECTRONIC CROSSOVER

The 18 dB per octave, three-pole "true" Butterworth alignment of the new mono two-way unit is said to provide "ruler flat" frequency response through the crossover region. Audible transparency is improved with the use of high-speed, low-noise circuitry.

The 403-M has detented and recessed front panel controls calibrated in dB, LED peak output indicators, and power turn-on/turn-off suppression. Even if power is disconnected, the output of the electronic crossover will be clamped down, thereby preventing any electronic thumps in the system that could harm speakers or drivers.

The new crossover offers continuously variable crossover frequencies from 40 Hz to 12 kHz (low frequency 40 Hz to 8 kHz; high frequency 600 Hz to 12 kHz), and occupies 1¾ inches of standard 19-inch rack space. Input and output connections are terminated with ¼-inch phone jacks.

Specifications include: 20 kohms input impedance (balanced or unbalanced);

New Products

+24 dB input level (reference 0.775V); +18 dBm output level; frequency response 20 Hz to 20 kHz within 0.25 dB; harmonic distortion less than 0.01%; and a noise level of -93 dB (A-weighted).

PHOENIX AUDIO LABORATORY
91 ELM STREET
MANCHESTER, CT 06040
(203) 649-1199
For additional information circle #122

AMS UNVEILS AUDIO DELAY COMPENSATOR FOR USE WITH DIGITAL VIDEO SYNCHRONIZERS

The new A/V SYNC utilizes microprocessor control to allow interference-free automatic adjustment of delay in the audio path to compensate for the video delay caused by a video synchroniser, even if step changes in video delay occur.

The increasing use of video delay lines as synchronizers between two non-synchronous video feeds has created a problem in maintaining lip-sync. This problem is even worse if several such units appear in series. The effect is most disturbing since the sound of an event occurs before its cause is seen — a situation not duplicated in nature, unlike the reverse where the observer's distance from the source fully explains the phenomenon to the brain.

The only way to bring sound and vision back into sync is to delay the audio channel as well as the video. The obvious problem here though, lies in determining how much delay has been introduced by the video synchronizer, and setting the audio delay accordingly. This is obviously unsatisfactory, since the video delay may be continually drifting, or undergoing step changes.

The new AMS unit is designed to completely eliminate this problem by actually measuring the video delay inserted, and then automatically applying the corresponding delay to the audio channel. Step changes and gradual shifts are both compensated for without interference to the audio signal. Advanced digital techniques are said to ensure impeccable noise and distortion performance.

As stereo audio grows in popularity for TV broadcasting, it is possible to add an additional one or two channels to the A/V SYNC whilst still retaining its one-unit panel height. Thus the unit does not need to be duplicated or become obsolescent as synchronizer sizes decrease. One of these channels may also be used to delay SMPTE timecode if required.

ADVANCED MUSIC SYSTEMS
WALLSTREAMS LANE
WORSTHORNE VILLAGE
BURNEY, LANCASHIRE
ENGLAND
0282-36943
For additional information circle #123

ROLAND STUDIO SYSTEMS RM-1200B AND RM-1600B MIXING CONSOLES

Designed primarily for sound reinforcement, the RM-1200B and RM-1600B boards feature 12 and 16 balanced microphone inputs, respectively, with stereo mains, dual monitor busses, an effects bus, and a full cue system. Additionally there is a mono output, derived a straight 2:1 fold of the stereo mains.

Since each monitor send is switchable (pre-fader and EQ, or post-EQ/pre-fader, or post-fader and EQ), they can be used for foldback mixes, additional echo/effects mixes, or discreet mono or stereo feeds to recording or remote facilities. Cue buttons allow for headphone solo of each input, mixing bus, effects return, and aux return.

A 4-band EQ with high pass dual-frequency filters is provided on each input signal; in addition two nine-band graphic equalizers can be switched to the program or monitor outputs.

Each input has a mike/line/pad switch, pre-amp gain trim, and overload warning LED. Bus gain trim controls and overload LEDs make it possible to optimize gain structure — minimize noise and distortion — no matter how many inputs are added to the mix.

Four line inputs are designated for effects returns or auxilliary inputs, each with its own level and pan control. In addition, outboard signal processors can be inserted in each channel using the patch in/out points provided; the patch out also doubles as a direct out for splitting a feed to a monitor board, multitrack recorder, etc.

The RM-1200B retails for $2,195, and the RM-1600B for $2,795.

ROLAND STUDIO SYSTEMS
2401 SAYBROOK AVENUE
LOS ANGELES, CA 90040
(213) 659-6114
For additional information circle #124

NEPTUNE MODEL 1010 GRAPHIC EQUALIZER AND ANALYZER

The new combined 10-band octave graphic equalizer and real-time analyzer is described as offering the ultimate in quality and versatility in one package. The Model 1010's RTA section

clearly shows the response of any system being analyzed, displayed on its 10 by 9 LED matrix. Features include switchable pink or white noise sources, independent patching, and accessible front panel controls.

Like all other NEI Signal Processing components, the 1010 is ready to mount in a road/flight case to withstand the use and abuse of road work, and still be a critical, accurate instrument with impeccable sonic performance.

Other features include: RTA section comprising 10 octave bands displayed on a 9-position LED matrix with ISO frequency centers; microphone input and line-level input/output connectors; internal digital pink noise generator with level control; rear panel switching for either pink, or white noise; 12 dB boost or cut on each of 10 ISO centered, octave bands; and smooth action, oil-damped slide controls with center detent on each band.

NEPTUNE ELECTRONICS, INC.
934 NE 25TH AVENUE
PORTLAND, OR 97233
(503) 232-4445
For additional information circle #125

360 SYSTEMS ANNOUNCES NEW DIGITAL KEYBOARD

The Digital Keyboard is said to leave the mainstream of electronic instruments, and returns to tackle *real* acoustic instrument sounds. An entire catalog of real instruments has been recorded and stored on digital memory chips, meaning that virtually any instrument sound can be provided for the keyboard.

The user selects any 16 from the catalog, plugs them into the Keyboard, and plays. Variations on each instrument are available, and instantaneous switching from one to another lends the realism expected of real instruments. Different sounds can also be played at the same time, either by having them both under all the keys, or by splitting the keyboard so one instrument appears under each hand.

Each sound can be adjusted by means of a number of front-panel controls. For example, tone "color" can be shifted to make an instrument function well as a background voice, rather than as a solo instrument. Large "sectional" sounds can be achieved through the "chorus" and "delay" buttons, which tend to double the number of instruments heard for each key pressed.

According to Bob Easton, president and marketing manager of 360 Systems, design goal for the Digital Keyboard was to create another very basic, high quality instrument with broad usefulness. "There are few frills, but a great deal of attention has been paid to practical matters," he says. "For example, each note plays for a long time, without 'freezing,' 'looping' or otherwise becoming an electronic simulation of the real thing. Every note has good 'top-end,' low distortion and low noise, too. Anyone should be able to go into the studio and lay down tracks for album dates, film scores, or even perform live, and feel good about the quality of the sound he is providing."

Although there are no limitations on what 360 Systems can program for the Digital Keyboard, the plan is to provide sounds that can't be obtained from conventional synthesizers, and the sounds of instruments that aren't portable — such as pianos and pipe organs.

360 SYSTEMS
18730 OXNARD STREET #215
TARZANA, CA 91356
(213) 342-3127
For additional information circle #126

DELTALAB UNVEILS EFFECTRON EFFECTS UNITS

Described as providing high-quality digital delay at a price that everyone can afford, the new devices utilize DeltaLab's patented Adaptive Delta Modulation (ADM) technology to provide "a new standard of performance, quality, simplicity and low cost," according to company president Richard E. DeFreitas.

The Effectron is available in two

models: the ADM 256, with a suggested retail price of only $499, is a full bandwidth, wide dynamic range, special effects digital delay processor that features flanging, doubling, chorusing and echo effects with up to 256 milliseconds

of high-performance delay.

The ADM 1024 is identical to the ADM 256 except that it provides the user with 1024 milliseconds of full bandwidth delay. As such, the ADM 1024's capability extends even beyond that of Delta Lab's performer series DL-4. Suggested retail price for the ADM 1024 is only $699.

DELTALAB RESEARCH, INC.
27 INDUSTRIAL AVENUE
CHELMSFORD, MA 01824
(617) 256-9034

For additional information circle #74

PANASONIC INTRODUCES TWO NEW MIXING CONSOLES

The WR-8112 provides 12 inputs, while WR-8118 provides 18 inputs. Both mixers feature four group, one mono, and two master outputs, and offer a 3-band equalizer section with switchable frequencies on high and low, and sweep midrange.

Access jacks are provided on each input and the group output, L and R master and mono outputs. There is stereo tape monitoring on each channel, switchable to stereo effects sends. The new mixers offer a send control with a

pre post selector switch, left and right channel assign capability, metering of eight output signals and solo metering, and XLR and phone jack connectors. A 48V phantom power supply is provided for each model.

The WR-8112 console has a suggested price of $2,495; price of the WR-8118, to be available in October, will be announced.

PANASONIC PROFESSIONAL AUDIO DIVISION
50 MEADOWLANDS PARKWAY
SECAUCUS, NJ 07094
(201) 348-7000

For additional information circle #76

FOSTEX M55 PRINTED RIBBON STUDIO MICROPHONE

The M55's Printed Ribbon system is said to produce the sonic delicacy of a high-quality condenser, and the warmth of a ribbon microphone, all with the durability of a dynamic.

The low-mass printed ribbon RP diaphragm is energized via a powerful magnetic circuit instead of an electros-

tatic field, thus removing the requirement for phantom power and matching the ruggedness of the best dynamics. The M55RP produces less than 0.1% third harmonic distortion at 130 dB SPL, and is not limited by internal pre-amplifiers.

By using a studio-type bidirectional capsule in the M55RP, the rear pickup pattern is described as very smooth and linear allowing near perfect cardioid performance. This results in higher achievable SPL before feedback, and uncolored on-axis response. Special attention has been paid to the internal construction to reduce handling and cord noise.

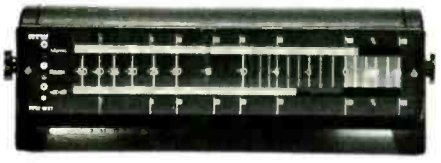
Suggested list price: $449.00.

INTERLAKE AUDIO INC.
620 KING EDWARD STREET
WINNIPEG, MANITOBA
CANADA R3H 0P2
(204) 775-8513

For additional information circle #77

RTW PEAK PROGRAM METERS NOW AVAILABLE FROM AUDITRONICS

A standard in Europe for many years, these instruments, unlike VU meters, permit precise indication of maximum program level, and when used properly allow production or transmission of optimum output levels with minimum compression or limiting.



Total indication scale is 55 dB, and many models include a 20 dB expansion characteristic permitting accurate metering of low-level signals. Many models also include a memory feature, allowing indicator hold of maximum level reached throughout a total program pass, making them an invaluable production tool.

Stereo meters start as low as $394.00.

AUDITRONICS, INC.
3750 OLD GETWELL ROAD
MEMPHIS, TN 38118
(901) 362-1350

For additional information circle #78

LOFT MODEL 401 PARAMETRIC EQUALIZER

The new parametric equalizer features detented controls that allow quick and accurate adjustments to be made that are repeatable. Front-panel controls include continuously adjustable frequency, adjustable bandwith ("Q"), and selectable boost/cut.

The LOFT 401 has four overlapping frequency bands that cover a range of 30 Hz to 20 kHz with 18 dB of boost or cut: low band 30 to 600 Hz; low-mid band 100 Hz to 2 kHz; mid band 400 Hz to 8 kHz; and high band 1 kHz to 20 kHz.

The "Q" or bandwidth control allows the affected frequency range around the center frequency to be adjusted between 1/6 and three octaves. In addition, the bandwidth can be adjusted without affecting the amount of boost or cut.

The Model 401, which is rack-mountable and occupies 1¾ inches of rack space, incorporates a pre-amplifier (with up to 20 dB of gain) and an additional low-level output, enabling simultaneous line- and instrument-level feeds.

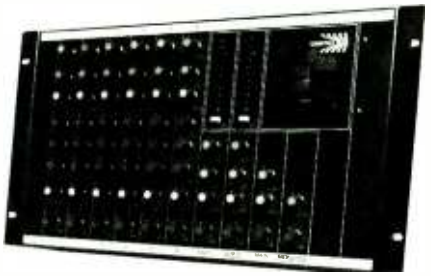
PHOENIX AUDIO LABORATORY
91 ELM STREET
MANCHESTER, CT 06040
(203) 649-1199

For additional information circle #79

new products

NEW MODEL 683 COMPACT MIXER FROM BIAMP

The new six-channel board, the latest addition to Biamp's popular 83 Series, incorporates totally new system architecture and circuit topology, resulting in 25% to 50% less noise than most comparable units on the market. Instead of conventional integrated circuits in critical areas, Biamp has used discrete transistors, which are said to develop at least 15 dB less noise than the best IC's.



Total harmonic distortion and intermodulation distortion have been reduced to such low levels that they are very difficult to measure under normal operating conditions. Under typical conditions with 10 dB loss on each fader, 10 dB loss on the trim control, and an output level of +4 dBm, distortion is lost in the noise, and measures less than 0.01%, the theoretical noise floor of the unit.

Hum and crosstalk have been virtually eliminated by the development of new condensed, symmetrical layout techniques for the printed circuit boards. Another unique feature is the use of a bracket secured with screws to transfer stress away from connectors and circuit boards to the chassis, and which helps create a rugged package capable of withstanding all kinds of abuse.

High-density mechanical packaging allows the Model 683 to be used as a consolette or rack-mount without compromising connector placement. And the mixer is claimed to take up less rack space than any other unit in its class.

Other features include floating and balanced outputs, metering on all outputs, separate reverb control in the monitor, reverb routing to the subs, three-band EQ, and 10-segment LED output display.

BIAMP SYSTEMS, INC.
P.O. BOX 728
BEAVERTON, OR 97075
(503) 641-6767
For additional information circle #82

NORTRONICS UNVEILS POWERFUL HEAD DEGAUSSER

Model PF-208 Professional Head Degausser is designed with a super High-Flux coil-core to demagnetize 2-inch tape heads and guides. A peak magnetic field strength of 1000 gauss is claimed to make it the most powerful handheld degausser currently available.

Other features include an auto-reset thermal protection device which prevents coil burn-out damage by maintaining a safe operating temperature; a positive snap action on-off switch for operating convenience; a Krayton thermal plastic/rubber covered probe tip to prevent scratching delicate heads; a durable, high-impact Lexan plastic housing to withstand rigorous studio environments; a lightweight, 12-ounce design to minimize operator fatigue; and UL approval for added safety.

The new Model PF-208 head degausser is expected to retail at a price of $39.95.

NORTRONICS COMPANY, INC.
8101 TENTH AVENUE, N.
MINNEAPOLIS, MN 55427
(612) 545-0401
For additional information circle #83

WESTLAKE INTRODUCES BBSM-6 PORTABLE REFERENCE MONITOR

The BBSM-6 is the first in a new series of portable 3-way, dual woofer monitors. It utilizes two 6-inch woofers, a 3½-inch cone mid-range, and a 1-inch dome tweeter in a totally symmetrical 1.7 cubic foot enclosure.

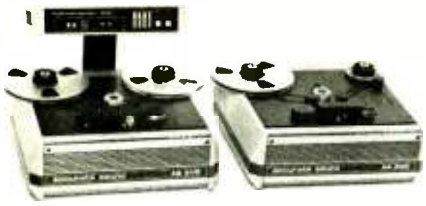
Units will be available in utility black without grilles, or walnut with grilles.

WESTLAKE AUDIO
7625 SANTA MONICA BLVD.
LOS ANGELES, CA 90046
(213) 851-9800
For additional information circle #84

ACCURATE SOUND AS-200 HIGH-SPEED TAPE DUPLICATOR

The new reel-to-reel model features duplicating speeds of 240 IPS, an all DC servo system, a 10 MHz bias frequency, and an audio bandwidth exceeding 1.5 MHz. This compact table-top duplicating system is described as packing a tremendous production capability into a small space-saving package.

Master tapes recorded at 7½ IPS can be duplicated at 240 IPS (32:1 duplicat-



ing ratio), a speed four times that available on most current reel-to-reel duplicating systems.

An optional floor stand is available with the unit, and a companion loop-bin master system will be ready for delivery by mid-June to facilitate high-speed cassette duplicating at a ratio of 64:1 for full-range music material, and 128:1 for voice material.

The system is expandable to 10 slaves per master. Both the master and slaves will accommodate a 14-inch reel and, as an optional feature, an auto-cue logic board is available which provides automatic rewind and cue for bin-like productivity with the reel master.

Frequency response for 7½ IPS copies is within 3 dB, 50 Hz to 18 kHz, with less than 45 degrees phase error at 15 kHz.

ACCURATE SOUND CORPORATION
3515 EDISON WAY
MENLO PARK, CA 94025
(415) 365-2843
For additional information circle #85

FULL RANGE COMPONENT PA SYSTEM FROM CERWIN-VEGA

The V-100 is a three-way component type sound system, perfectly suited for in and out PA and theater applications.

The low-frequency L-36PE enclosure is a folded, compression horn containing an 18-inch 189JE driver. It is rated at 400 watts continuous power (EIA RS426A), and with equalization power response down to 30 Hz is possible.

The RM300 fiberglass midrange horn is a radial exponential-type fitted with a newly developed M-150 high-power compression driver, housed in a carpet covered plywood enclosure. In addition to its extremely high magnetic motor force, the M-150 is unusual in that the large phenolic dome is driven nodally; rather than attaching the voice coil at the circumference, the coil drives the dome approximately midway through the radius. The resulting increase in effective stiffness and pistonic integrity is said to translate to markedly reduced distortion and breakup modes at high power levels.

The RMH-3000 HF enclosure is a cast aluminum radial exponential horn fitted with a JMH-1-16 driver and enclosed in a carpet-covered plywood cabinet. A two-pole crossover at 3.3 kHz and self-resetting relay protection are built-in.

A single high-power (300 watts/8 ohms) amplifier channel "daisy chained" to all speakers will drive the entire system; built-in 2-pole (12 dB) networks in the units provide optimum transition between drivers. Not only does this greatly simplify setup in portable systems, but also the possibility of driver damage due to improper hookup is is virtually nil. The system may also be bi-amplified with a 300 Hz low-level crossover.

CERWIN-VEGA
12250 MONTAGUE STREET
ARLETA, CA 91331
(213) 896-0777
For additional information circle #86

TWO NEW SOUND REINFORCEMENT MIXERS FROM PANASONIC

The WR-8724 features 24 input channels and 10 meters, including one meter that is switchable between echo left, echo right and solo metering for any channel. This unit is equipped with four group, two master, one mono master, plus two send and two echo busses for a total of 11 outputs. The mixer also features 100 Hz and 10 kHz equalizer controls on the echo return section.

Totally independent mono outputs are also provided from each of the four groups, as well as the left and right outputs. For the soloing of channels during sound checks, the WR-8724 is equipped with a switchable solo-to-main mono output function with a separate level control. Another level control is also provided for solo monitoring.

The WR-8724 has a suggested retail price of $8,000.

The WR-8724/16, which is similar to the WR-8724 but includes only 16 input modules in a 24 channel mainframe, has a suggested retail price of $6,630.

PANASONIC PROFESSIONAL PRODUCTS DIVISION
50 MEADOWLANDS PARKWAY
SECAUCUS, NJ 07094
(201) 348-7000
For additional information circle #87

CETEC GAUSS INTRODUCES RECORD STUDIO MONITORS

The Model 7351 monitor system is described as offering superior discrete sourcing and higher audio output. It combines efficiency, high power handling and full power response across its wide bandwidth without the mechanical sound prevalent in most monitors, according to Mort Fujii, president.

"The components of the Model 7351 are blended by using the concept of 'acoustic crossover,' which dictates unconventional crossover points in order to attain a smoother and more transparent response," Fujii said.

CETEC CORPORATION
9130 GLENOAKS BOULEVARD
SUN VALLEY, CA 91352
(213) 875-1900

For additional information circle #91

NEW PORTABLE STEREO MIXER FROM SONY

Designed for on-location broadcast application in ENG/EFP situations, the new MX-P42 mixer combines up to four separate audio sources to stereo outputs, and features onboard compression/expansion. Features include panning for precise stereo imaging; automatic level control; solo functions on all four inputs; and high-pass filters selectable at either 80 or 160 Hz, plus 11 kHz low-pass filters.

The mixer's automatic level control has a variable expander threshold level of -40 to -10 dB, with attack time of less than 50 microseconds, and a recovery time of 0.1 second. With a fixed threshold level, the compressor has an attack time of less than 50 microseconds, and a recovery time choice of either 0.5 or 0.1 second. Frequency response is a quoted 30 Hz to 20 kHz, ±1.0 dB, and harmonic distortion rated at less than 0.1% at +4 dBm.

The mixer has two pairs of stereo outputs. The first pair provides a line level of +4 dBm into 600-ohm circuits with 16 dB of headroom, and the second pair is switch-selectable to provide levels of either -20 or -64 dBm into a 600-ohm circuit.

The MX-P42 measures approximately 10½ by 8 by 3 inches, and weighs only 8 lbs 10 oz complete with batteries.

SONY CORPORATION OF AMERICA
9 WEST 57TH STREET
NEW YORK, NY 10019
(212) 371-5800

For additional information circle #92

news

— continued from page 12 . . .

the international line of Otari products in the production end of the broadcast, telecommunications and recording studio businesses. Our close proximity to the largest production markets in the world allows for close interaction and involvement with end users in the development and field testing of our products."

SOUNDCRAFT TO SERVICE DEALERS DIRECT

Wayne Freeman, sales and marketing director of Soundcraft USA, has announced that effective June 1, 1982, Soundcraft will handle all dealer sales on a "factory-direct" basis. This new policy is being implemented to provide better support for the dealers and faster communications. All orders and service requests are to be directed to Soundcraft USA, 20610 Manhattan Place, Torrance, CA 90505. (213) 328-2595.

In addition, Freeman announced that the company will handle sales of its large, automation-ready Series 2400 consoles on a factory to consumer basis on the West Coast only. Sales in other parts of the country will continue to be handled by authorized Soundcraft dealers.

Double Ampex Golden Reel Awards recently were awarded to Frankie Beverly & Maze for their two most recent Gold Albums, *Joy and Pain* and *Live in New Orleans*. Scene of the presentation was San Francisco's Bay Area Music Awards at the Civic Auditorium, where band members McKinley Williams, Billy "Shoes" Johnson, Roame Lowry, Robin Duhe, Frankie Beverly, Philip Woo, Sam Porter and Ron Smith joined other top acts and music industry professionals gathered to honor San Francisco-based music and musicians. The Ampex Golden Reel honors the entire creative team behind top-selling albums and singles — producer, recording studio and engineer, as well as performing artists. In addition, artists select a non-profit charity to receive a $1,000 cash contribution from Ampex. The program has awarded more that $275,000 in charity contributitions since its start in 1977.

MASTER DIGITAL CHOSEN FOR DUPLICATION OF dbx CASSETTES

Master Digital, Inc. of Venice, California, has been selected by dbx, Inc. to duplicate in real time the cassettes for its newly launched dbx Cassette Program. According to dbx vice president Jerome E. Ruzicka, Master Digital will be duplicating more than 80 titles in the dbx Cassette catalog.

Established in 1981 by Roger Pryor, former head of Sony's digital audio division, Master Digital offers complete state-of-the-art audio and visual techniques in its productions, cassette mastering and service operations. "Because we have long considered dbx noise reduction to have the leading edge, we are especially delighted to have been chosen by dbx to produce cassettes in the dbx format for their encoded cassette program," Pryor said. "Master Digital will provide tape copies of the dbx cassettes recorded in real time from 16-bit digital audio masters."

The cassette transports used for duplicating the dbx Cassettes are the new Sony TC-K777 decks. A Sound Technology 1500A Analyzer monitors and calibrates azimuth and tape path alignment, and provides a quality check. All cassettes are monitored against the master as they are recorded, followed by two additional stages of quality control before shipping.

Digital Update

Neve MD Derek Tilsley (left) with CTS Studio's Peter Harris. Overlooking the existing CTS Neve ar a og console are Les Lewis of Neve (center), flanked by CTS engineers Dick Lewzey and John Richards.

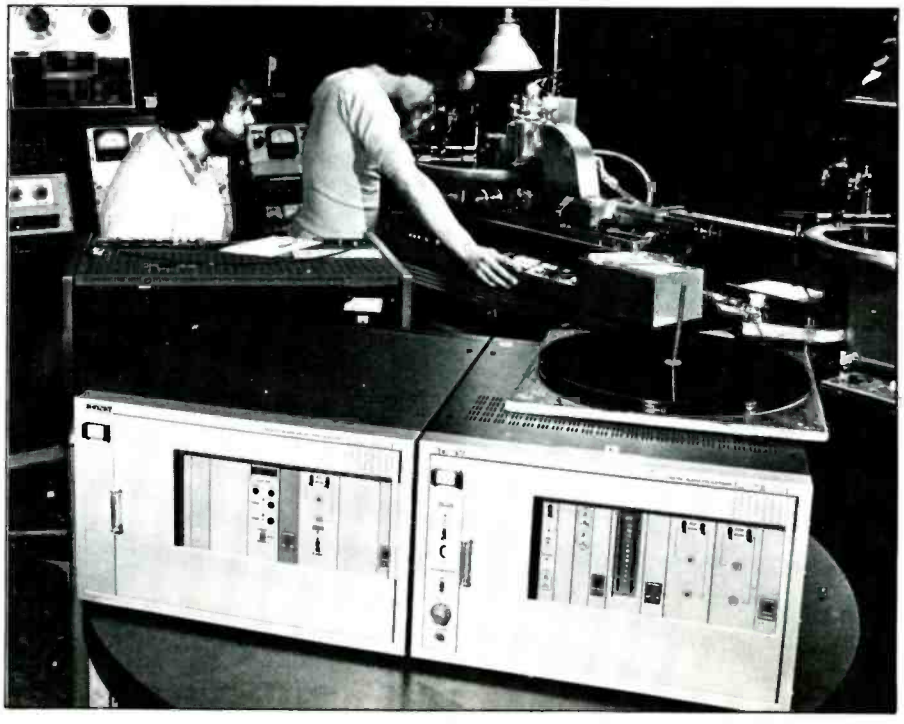
LEADING LONDON STUDIO ORDERS NEVE DSP DIGITAL CONSOLE

Following the recent decision by the British Broadcasting Corporation to install a 48-input Neve DSP digital console in a special mobile outside-broadcast vehicle, CTS Studios, Wembley, London, has placed an order for the second DSP desk to be produced by Neve.

CTS Studios purchased its first Neve desk in 1972. It is said to be still in constant use, along with four others since purchased from the company. According to CTS managing director, Peter Harris, the new DSP console "will be much more adaptable and flexible in use, and the quality of sound will be even better than the usual optimum degree of fidelity inherent in Neve equipment."

Recently, CTS Studios won a major award for its recording of the film score for *The French Lieutenant's Woman*, and has been used to score such films as *For Your Eyes Only*, *Superman*, and *The Muppet Movie*.

CBS engineer **Joe Gastwirt** (right) is shown with Sony's east coast digital audio engineer, **Gus Skinas**, at CBS Studios mastering Paul McCartney's recently released *Tug of War* album. The LP, produced in London, was digitally recorded and mastered by CBS using Sony's PCM-1610 digital audio processor and Sony's new DDU-1520 preview unit along with the CBS DISComputer. Use of the Sony preview unit in the lacquer-cutting process helped to boost lacquer levels. According to CBS' Gastwirt: "The results were impressive. [Producer] George Martin and his engineer, Geoff Emerich, compared the pressings that were done without the digital delay line with the digitally-mastered lacquers, and found that the master cut by CBS was 3 dB hotter. He immediately ordered 30 lacquers made from the CBS Sony system for European pressings, and 24 for US pressings."



OMEGA AUDIO HOSTS DIGITAL SESSIONS FOR TEXAS BAROQUE ENSEMBLE

During the recent NAB Convention held in Dallas during April, Omega Audio and Video Post & Transfer hosted the Texas Baroque Ensemble for digital recording sessions with both JVC and Sony digital recorders. The JVC equipment was provided courtesy of Wally Wilson of Wilson Audio Sales, Nashville, while the Sony session was hosted by John Moran of Digital Services Co., Houston. Ron Lagerloff engineered both sessions.

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- *Westminister, CA* — **Suntronics**
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- *San Rafael, CA* — **Bananas At Large**
- *San Francisco, CA* — **Sound Genesis**
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- *Atlanta, GA* — **Metro Music Center**
- *Minneapolis, MN* — **Audio Perfection**
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For additional information circle #101

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book review

CRITICAL LISTENING — AN AUDIO TRAINING COURSE

by F. Alton Everest

108 Pages (softcover) and five permanent audio cassettes (approximately 20 minutes each side), packaged in a plastic binder; $129.95.

"Critical Listening — An Audio Training Course" (it might more aptly have been titled "Acquiring Listening Expertise") is a novel approach to providing instruction in the evaluation of audio quality, and is intended for a broad range of intensely interested "listeners"; professionals, audiophiles, and students. The essential topology of the course is 10 lessons (text and tape) that deal initially with subjects such as the estimation of frequency of sound, sound level changes, and frequency band limitations. Later chapters delve into frequency response irregularities, judgment of sound quality, detecting distortion, and reverberation. Finally, the course concludes with signal versus noise, voice colorations, and listening with discernment.

Each lesson is discussed during a 20-minute instruction on one side of an appropriate audio cassette. A printed transcript of the lecture is found in the accompanying Manual for Critical Listening. Each page of this book is formatted in an approach that the author refers to as "TALK-TECH." In this instruction method, the transcript of the audio tape or "TALK" is printed on the left side of the divided page. On the right side the "TECH" is demonstrated through a variety of technical definitions, graphs, and illustrations that deal with the present subject on the tape. Using this clever method the listener can easily assimilate and retain the information presented in this unique audio/visual study.

In the introduction F. Alton Everest defines his purpose for creating the course. He points out that experienced sound mixers build up listening experiences throughout the years, and attain their "golden ears" by having a keen auditory sense and sharp memories. By dealing with audio problems, in time the skilled engineer acquires the ability to know what makes good sound, and what can degrade it. Mr. Everest then states that this "study is designed to accelerate, not replace, the usual process of slow learning by experience on the job. In fact, the whole idea is to subject the trainee to experiences similar to those which lifted the accomplished listener to his present high skill."

When viewed in this context the course succeeds in its purpose. This series of studies will not teach an experienced engineer how to achieve a better mix, although it very well might fill in some gaps in his or her presently attained education. However, it best serves, in this reviewer's opinion, the student engineer or "trainee" who will want to better understand what he is supposed to be listening for in a recording studio, or live PA mix situation.

As examples, Lesson 3 has exercises in estimating frequencies where lo-cut and hi-cut filters have been applied to music, as well as male and female voices. The next section examines the effect of frequency peaks and dips on the same audio passages. Lesson 6 trains the listener's ears to detect a minimum of 2% total harmonic distortion (THD). It demonstrates that a given amount of distortion in a vocal is much more obvious to the ear than the same amount in a musical passage. Lesson 7 contains an excellent example of how increasing reverberation times can mask intelligibility of speech, when excessive delayed openings of words blur the ending consonants. Illustrations show, in one example, the critical time when speech detail is lost as reverberation increases.

In Lesson 9 voice colorations are examined in various acoustical environments. The listener is asked to guess-timate the coloration in each of 10 voice examples. Musical passages demonstrating the entire range of aural faults previously examined are left for the listener to identify and chart on a convenient form. Answers to quizzes in Lessons 9 and 10 are found in back of the manual.

Invariably it seems that whenever a text or course deals with such a broad subject as critical listening in audio, limits must be placed by the author on the extent of the material to be covered, in order to provide a digestible amount of packaged information to the student. However, as soon as limits are placed, it also seems that some important topics are treated lightly or not at all for the sake of content size. In this case, diverse concepts such as limiting, compression, Hass Effect, and proximity effect, to name just a few, are not even mentioned. The finer points of other subjects included in this study, such as equalization, are never fully explored. An engineering sense of what constitutes low, mid, and high frequencies is never really established, even though a variety of frequency bands are examined throughout the audio passages. It is unfortunate that the audio principles selected by the author do not receive a more indepth examination.

It should be remembered though, that to cover all the additional subject material mentioned above, The Critical Listening Course would have run to several more cassettes, which would have increased the cost. So, to be realistic, the material as presented here does represent a very reasonable introduction to the subject, and the interested reader can then pursue an independent course of study having established at least the necessary subjective ground rules.

A few criticisms on the product packaging must be made here in order that future editions of this material do not exhibit such, admittedy minor, flaws. In the two course copies reviewed here, both cassettes suffered from small bursts of flutter. This was quite noticeable during the passages that used 1 kHz tones for an estimation of loudness in Lesson 2. Also the finger indentation for cassette removal from the plastic binder was omitted from the fifth cassette position.

At $129.95 does F. Alton Everest's Critical Listening Course offer good value for money? That's not an easy question to answer, since it is rather unique in its presentation and content. However, seen against the cost of introductory audio engineering programs and seminars, which can range upwards of $600 or more, then this course becomes a valuable instruction tool for the novice engineer, especially if they cannot receive a one-on-one instruction in the audio basics. By using this study, the fledging engineer can indeed shorten his audio training time. *Roman Olearczuk*

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