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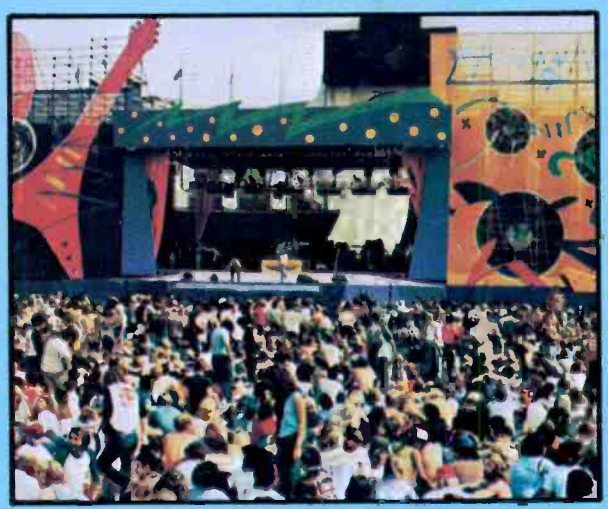
DECEMBER 1981
VOLUME 12 — NUMBER 6

First look: STUDER's Digital Multitrack and Universal Sampling Converter — Digital Update, page 105



SHOWCO doing the 'Stones Tour, page 62

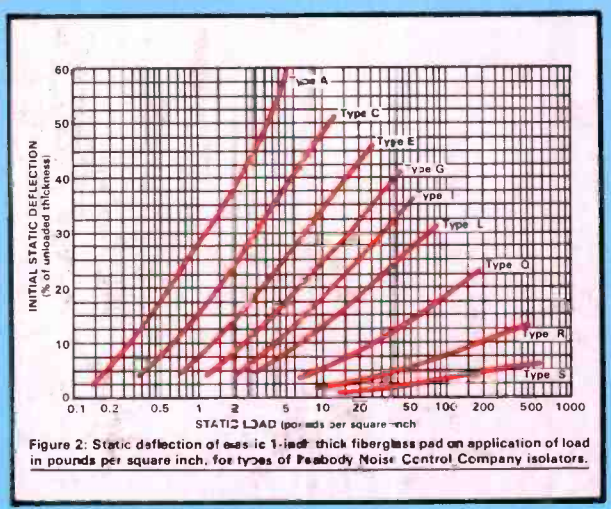
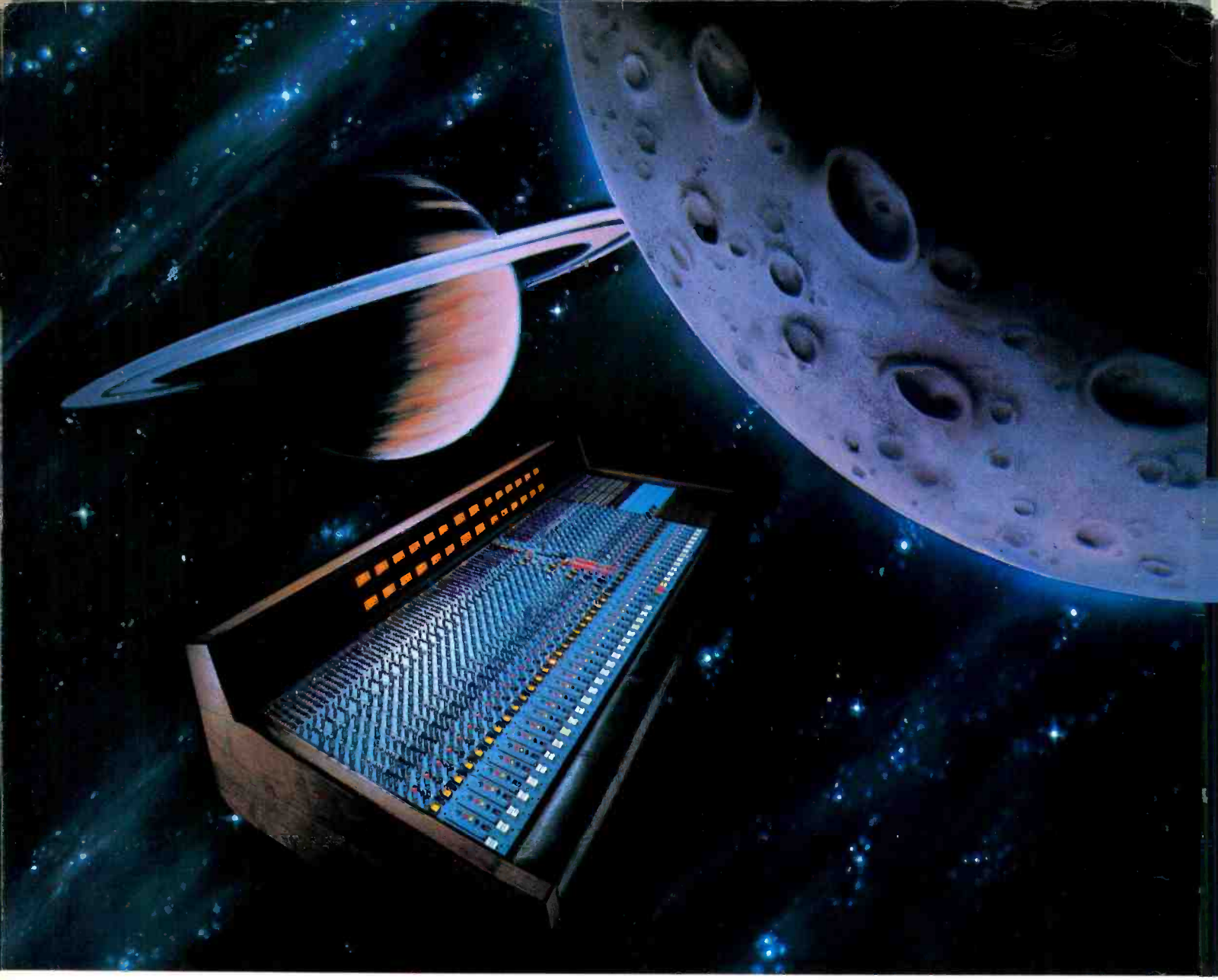


Figure 2: Static deflection of exemplary 1-inch thick fiberglass pad on application of load in pounds per square inch, for types of Peabody Noise Control Company isolators.

Floating Floors, page 80

RELATING RECORDING ART • TO RECORDING SCIENCE • TO RECORDING EQUIPMENT



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"It's ahead of its time, and that's where I like to be."

Suzanne Ciani, composer/producer and sound designer. New York

"I still find it hard to believe how much faster and easier all of my work has been since I put the MTR-90 in my own studio.

Tape handling is fast but gentle. Functions are straightforward. I can create without fear of 'waiting for the machine', concentrating on my art, not the buttons.

Because much of my work is synthesized electronic composition, my demands on the performance of a machine are some of the toughest imaginable; to compose just a short segment of music, I layer hundreds of passes on the tape. In a completed piece, there's lots of hours that are accumulated. The MTR-90 takes it all in stride; no tape wear, it holds alignment incredibly well, and I can use the outside tracks without worrying. There's very good crosstalk isolation which is so important to recording electronic music.

I also like the fact that the maintenance has been minimal.

The MTR-90 was also good news for my accountant. I had a budget that had to buy more than a multitrack recorder, and the Otari kept everything in balance — lots of headroom in the audio, and on the equipment budget.

Otari's absolute commitment to doing something right is really evident to me since I've put their machine to the test. And last, but not least, it's elegant and compact.

These are some of the many reasons I bought the Otari MTR-90; it's way ahead of its time.

And that's where I like to be."

Ms. Ciani, principal of Ciani Musica, Inc., a New York-based production company, is soon to release her first original electronic album, "New Waves" on the Victor Musical Industries label. She holds a Master's Degree in music composition and has been at the forefront of electronic music for nearly fifteen years.

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For additional information circle # 2

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And determined to keep it that way! Neve introduced the NECAM Computer Assisted Mixing System in 1976, to be immediately accepted by the recording industry as the only practical computer assisted mixdown system available. And in 1981, 5 years later, NECAM is not only maintaining but rather advancing its lead on the competition with the recent introduction of NECAM II. Ask the artists, the producers, the mixing engineers. Most of the top professionals in our industry agree NECAM is still the only practical automation system around. And it is fully compatible with video sound production facilities. Advance with NECAM, and join the Neve world of Excellence.

Some of the unique NECAM features:
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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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December 1981
Volume 12 — Number 6

— Contents —

— Views —

— Departments —

— The Cover —

Upper photograph: A prototype Studer digital 24-track machine, and companion SFC-16 universal sampling frequency converter. Studer's complete Digital Recording System will be demonstrated next March at the AES Show, Montreaux.

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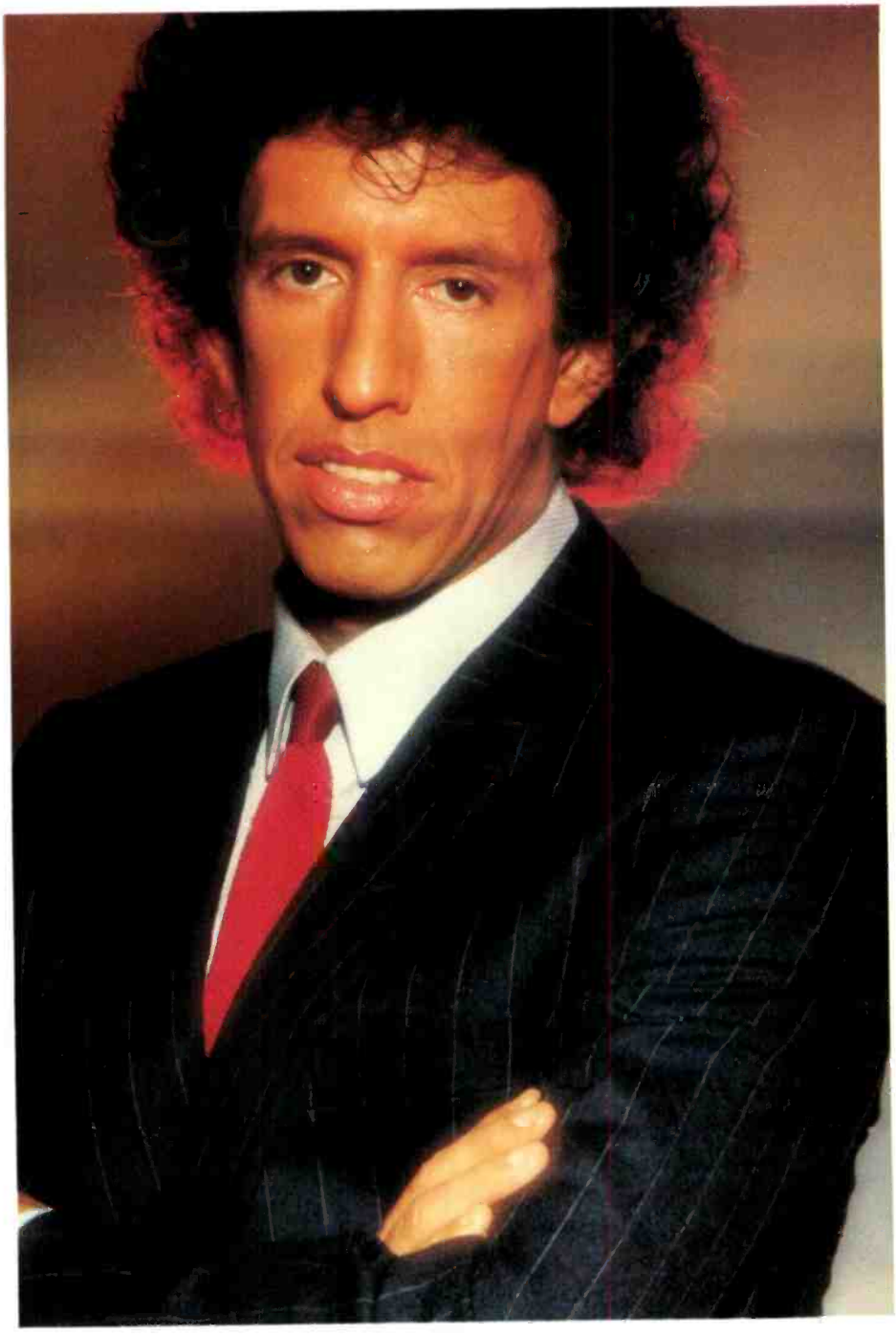

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Mr. Perry accepts no compensation for his endorsement. *December 1981* □ *R-e/p 7*

For additional information circle # 4

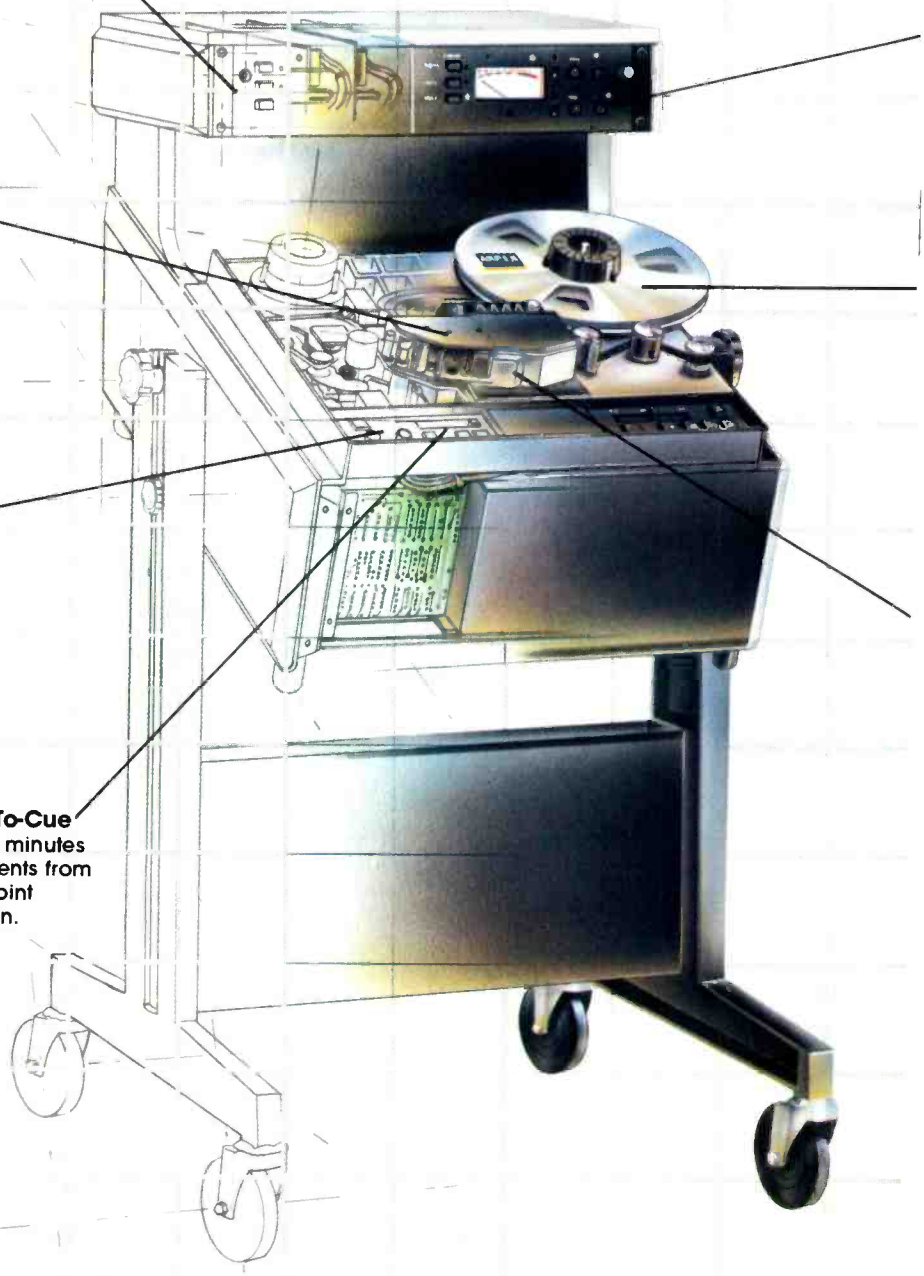
BROADCAST

Serviceability
Major electronic assemblies are plug-in and 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. Rehearse segments from exactly the same cue point at the touch of a button.



PRECISION

Switchable NAB/IEC Setup
At the flip of a switch, the recorder converts between NAB and IEC setup, including bias and levels as well as equalization curves.

Microprocessor Control
New tape transport design is under the full control of the microprocessor system, ensuring safe, gentle and foolproof tape handling.

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

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 the special audio needs of the broadcast professional. 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.

You'll find hands-on-reel and tape dump edit modes included for convenience. The standard cue amplifier will allow monitoring of any or all channels, right at the machine while it's being cued. And with flexible transport controls, you can now mount them either to the left or to the right side of the machine —whichever way you choose.

But the features don't stop there. You get 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, simple service access from the front of the recorder 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 has the number of standard features that meet the needs of the broadcast professional like the Ampex ATR-800. It's shipped for rack mount installation, and it's available in console and pedestal versions as well. Look into the ATR-800. 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

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For additional information circle # 5

views letters news

TIME DOMAIN RESPONSE OF MONITOR SPEAKERS

from: **Edward M. Long**
E.M. Long Associates
Oakland, California.

I was very pleased to read John Eargle's article in the October 1981 issue of *R-e/p*, entitled "Time Domain Response In Monitor Loudspeakers." It encourages me to see such prestigious companies as JBL attacking the problem of time-offset aberrations in the design work they are presently doing on monitor loudspeakers.

While Figure 7 of the Blauert & Laws paper does show a 1 millisecond group delay perception centered at 2 kHz, for seven test subjects, a further reading of their paper finds them saying that "after only one day of training we found a reduction in threshold values from 0.86 to 0.54 milliseconds, and in the following session the asymptotic value of 0.4 milliseconds has already been reached." They indicate that, with training, the threshold level for group delay perception decreases.

It is not without reason that UREI and JBL have opted for designs that reduce the group delay well below 1 millisecond, since recording engineers and producers must be considered trained listeners.

I would also like to add two small items: Blauert & Laws used Sennheiser MD-414 headphones during their tests; and Time-Align® as used in quotes in the article by John Eargle is a trademark of E.M. Long Associates.

STANDARDIZED POWERING OF MICROPHONES

from: **Dr. Gerhard Bore**
Georg Neumann GmbH
Berlin

The letter from Michael Strong in the April, 1981, issue of *R-e/p* ("Microphone Polarity and A-B Powering of XLR-3 Connectors") shows that there is a need for clarifying the entire matter of microphone powering. This letter serves to combine only the most important points of this subject, in an effort to remove any misunderstandings. Shortly the IEC will issue Supplement No. 1 to Draft 268-15, which will list all of the applicable powering systems for transistor-equipped microphones, and will set their specifications and tolerances.

AB Powering was introduced in 1963 specifically for transistor-equipped microphones operating according to the high-frequency (RF) principal:

AB Powering with 12 volts/max, 15 mA via two 180-ohm resistors. Positive (+) pole on pin 2; negative (-) pole on pin 3; cable shield (not carrying current) on pin 1.

For microphones in audio amplifier technology (using field-effect transistors), this sort of powering has only limited appeal:

1) The polarizing voltage for the capsule must be created using a DC converter, unless an electret capsule is used.

2) Other microphones, such as dynamic models, may not be connected to such microphone outlets without first disconnecting the DC voltage.

3) The modulation leads and the DC powering voltage are connected in parallel; therefore extremely good filtering of the supply voltage is required.

4) The microphone housing and the cable shield are only connected to the zero-volt point of the circuitry inside the power supply. The microphone cable, therefore, forms part of the circuit between high-impedance components in the microphone (which need to be shielded) and this zero-volt point. This configuration causes even small amounts of induced interference voltage to be capacitatively coupled to the amplifier input, whose self-noise level is only on the order of a few microvolts.

5) The small value, standardized powering resistors, which normally serve as the operating resistance of the source follower and terminate the microphone preamplifier, greatly restrict the design flexibility of the rest of the circuit.

Phantom Powering was introduced in 1966, when microphones using field-effect transistors (FET) became available. Three systems will be standardized:

P 48: +48 volt/max, 10 mA via 6.8 kohm resistors to pins 2 and 3;

P 24: +24 volt/max, 10 mA via 1.2 kohm resistors to pins 2 and 3;

P 12: +12 volt/max, 15 mA via 0.68 kohm resistors to pins 2 and 3.

The negative (-) pole is connected through the cable shield to pin 1.

Properties of this form of powering are as follows:

1) Other types of microphones, if floating, can be connected to such outlets without the need to switch off the powering voltage.

2) Modulation and DC voltage are decoupled from each other in the cable. This permits relatively large interference signals to be induced in the cable shield, provided a filter is installed at the microphone's power input and, in front of that, a sufficiently large or perhaps electronic regulator.

3) The stringent symmetry requirements can be much more easily met.

4) Amplitude modulated RF from

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For additional information circle # 7

letters

STANDARDIZED POWERING of MICROPHONES . . .continued —

radio and television transmitters cannot enter the powering system of the microphone, and therefore does not disturb signal transmission, since the cable's two conductors — both of which carry identical DC currents — act like a coaxial cable. (The balanced arrangement of the modulation wires are not subject to RF interference generally.)

Of the various standardized powering systems, the *P 48* type, by comparison to the *P 24* and *P 12*, usually requires a special 48-volt supply. In return, it has the following advantages:

a) Central power supplies only have to be slightly oversized in order to permit all microphones to continue to operate, even when one or two microphone cables are accidentally shorted to ground.

b) When plugging in such microphones, it is likely that one of its modulation pins connects before the other. This causes a short duration DC pulse to flow through the ensuing input transformer primary. In a *P 48* system this will be of much lower current, and therefore less likely to magnetize the core of the transformer.

c) Provided the total current drain remains below about 2 milliamps, the polarizing voltage for the capsule may be obtained directly from the powering voltage.

d) The larger resistance mentioned in 2) above may usually be a simple ohmic resistance, since there is a high enough voltage available. For *P 12* and *P 24* systems, on the other hand, a transistor circuit is required.

The advantages enumerated under paragraphs c) and d) permit simple and serviceable *P 48* circuitry. The advantage listed under c) does not apply if an electret capsule is used, or if the microphone is already equipped with a DC converter (for example: to permit the directional characteristic to be switched electronically).

The current drain of most *P 48* microphones is below 1 milliamp. Older power supplies and all Nagra and Stellavox recorders only provide approximately 2 milliamps conforming to DIN 45 596, which expired in August 1981. Microphones for the so called "universal phantom powering system," which are able to operate on all three powering systems after installation of prescribed series resistors, sometimes have a current drain greater than 2 milliamps. One may experience difficulty when connecting these microphones to older power supplies.

There is also a powering system not conforming to this standard used until recently in France and in Nagra recorders made by Kudelski. This is a 9-volt phantom powering system, which is being converted to the *P 12* system.

views

—AUDIO/VIDEO— RECORDING

BREAKING INTO THE VIDEO SWEETENING BUSINESS

by Bill Cutting
Bonneville Productions
Salt Lake City, Utah

With your present expertise and equipment, and a modest investment, a studio has within its power the ability to develop valuable new markets. Synchronization, or audio sweetening, is emerging as one of the most attractive new avenues open to the studio operator. Of course, many studio owners have an image of a sweetening session as one that involves rock musicians, producers, stars, starlets, groupies and network types — all rushing in to watch an engineer use technological whiz-bang gimmickry to save a so-so concert from permanent obscurity. . . . *continued on page 16* —

The New UREI Series "A" Time-Aligned™ Professional Monitoring Loudspeaker Systems

Since their introduction in 1977, the UREI 800 series monitors have steadily been replacing old-fashioned loudspeakers. In studios throughout the world, they've become the accepted standard — the critical standard by which all other professional loudspeaker systems are now judged.

Our new Series "A" models (811A, 813A & 815A) now incorporate the following improvements:

- The exclusive Time-Aligned™* crossover has been redesigned to allow the maximum power transfer to the transducers — improved sensitivity for more acoustic power per watt.
- A totally new High Frequency Exponential Horn design (Patent Pending) which includes a diffraction buffer, flare compensators, and shadow slots.
- The diffraction buffer has been added to the leading edge of the horn resulting in better impedance transformation to the atmosphere. This provides a substantially improved transition through the crossover region and dispersion is enhanced over the entire range of the High Frequency Horn.
- The Flare Wall Boundary treatment results in a reduction of transient distortion without degrading the power transfer characteristics of the Horn.
- Shadow Slots have been added to further improve the mid-range magnitude regularity and overcome the classic "shadow effect" characteristic of some coaxial systems.
- With a new diaphram and phasing plug, the high-end response on all three models now extends to well beyond 15 kHz.
- All models now feature a BNC type connector to accommodate the Conductor Compensation™ feature of UREI's model 6500 Power Amplifier.

The new series "A" monitors from UREI are available in three sizes to suit any monitoring requirement. They're accurate, powerful and improved.

From One Pro To Another — trust all your toughest signal processing *and* monitoring needs to UREI.

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The Sound Reinforcement Specialist: Ramsa WR-8716

When your sound says you're professional but your mixer doesn't. When you're wasting your subtlety and style on "make-do" boards. When you're creating compromises instead of clear-cut distinctions. Then you're ready for Ramsa—the new mixers that are specialized so you won't have to compromise.

The WR-8716 is a fully modular sound reinforcement console with 16 input modules, 4 group modules, and 2 masters. It features 16 input pre-fader solo buttons, 4 group modules with pre-fader insertion patch points, and lockable post-fader solo buttons. There are 6 illuminated VU meters with peak LED's for easy outdoor reading and a separate stereo variable frequency EQ for monitor sends. Pan pot controls allow panning to the left or right masters while level controls permit 16 x 6 board operation. The left and right direct channel assign function lets you bypass the group modules for individual sources. Portable operation is a snap with easy access connectors.

And the WR-8716 features plastic conductive faders for greater reliability and smooth, low-noise operation; external power supply for light weight, and switchable 48V DC phantom power for condenser mics.

RAMSA

The Recording Specialist: Ramsa WR-8816

The WR-8816 recording console includes the same modular construction, input modules, power supplies, and faders as the WR-8716 plus many important recording advantages. Like direct outputs for 4, 8, or 16 track recording and peak-reading LED meters that let you monitor any 4 out of 24 signals with clear, quick response.

You'll command a variable frequency EQ section with 3 frequency settings for the high and low frequencies plus continuously variable midrange. Stereo echo send replaces the separate mono controls you'll find on competitive boards. And you get two independent stereo monitor controls—one for musician's headphones, one for control room monitors—a special feature for any mixer in this class. And there are other important features like low noise electronically balanced mic inputs with new high-speed IC's, 16 switchable post-fader solo controls and XLR-type mic connectors.

Ramsa offers a full line of specialty mixers including the more compact WR-8210 recording mixer and WR-130 sound reinforcement mixer. So don't hold down your professional sound, call (201) 348-7470, because you're ready for Ramsa.

Panasonic®
PROFESSIONAL AUDIO DIVISION

— *continued from page 12 . . .*

BREAKING INTO THE VIDEO SWEETENING BUSINESS

A studio should realize, however, that such assignments are scarce. In the meantime your studio's potential could be put to valuable use in the world of audio sweetening in three basic areas: commercial production; musical scoring; and sound replacement and translation. Today, these markets are thriving, and available, to the studio operator who is willing to seek them out.

One company that learned this lesson early, is Salt Lake City's Bonneville Productions, which established itself as an experienced audio-replacement studio early on in the decade, using manual techniques. As the move to digital technology came about, Bonneville discovered that its clientele was already in place and eager to use the new techniques. Now audio sweetening provides a valuable adjunct to Bonneville's multi-track studio production business.

Bonneville's studio manager, Dave Michelsen, cites several reasons why audio sweetening for advertising agencies and independent producers makes good business sense.

"In the first place," he says, "Hollywood has been doing large-scale sound-replacement for years. But, there is no reason why the smaller studio cannot compete effectively. Secondly, the public is becoming more and more demanding in the quality of sound they hear on their television receivers — whether that sound comes from a commercial or a program."

He further explained that agency producers are responding to that demand, and discovering that not only is audio production of higher quality in a dedicated audio facility, it is roughly one-third the cost of producing it in a video-based studio.

"Best of all," he notes, "a studio need not invest in tremendously expensive new production equipment in order to satisfy these markets. A high-quality digital synchronizer that utilizes SMPTE time-code can easily be interfaced with existing tape machines."

Therein lies the sine qua non in this entire business of audio production for video and film. Synchronizers which utilize microprocessor technology have made it possible for an engineer to strip a sound track from a piece of video tape, transfer it to a multi-track audio machine for processing, editing and mixing, then replace it with full assurance or maintaining synchronization with the original material. A modern multi-source, SMPTE-based synchronizing system is capable of linking together two or more tape machines, holding them in frame-accurate lock-up for hours.

What it all boils down to is simply basic audio production applied to new video markets, using several key pieces of equipment. A recent synchronization session at Bonneville provides a good indication of where audio production is heading. A bank commercial for an automated teller machine was shot in an open convertible, and outside of a bank. The talent — a mother and two children — recorded dialogue on a scratch track of the 1-inch video tape. After the video had been post-produced, it was transferred to a ¾-inch video cassette with SMPTE time-code and a scratch audio, or guide, track. Simultaneously a multi-track audio dub, including the same SMPTE time code that was placed on the video tape, was prepared. The actors were assembled in Bonneville's Studio B, which is permanently outfitted with TV monitors. As the scratch track played in the actor's headset, each would repeat their original dialogue in sync with their lip movements being replayed from video tape. The completed dialogue track was actually an assemblage of many takes, edited together with the aid of time-code accuracy.

Once that step had been completed, the engineers added controlled ambience — traffic sounds and street noise — along with synthesized "beeps" synchronized to fingers pressing the teller machine buttons. Lastly, music was scored in much the same way as the actors' lines. A final mix was completed with all audio on one mono track, and time-code on another. Finally, that single track was dubbed back on to the master video tape in frame-accurate synchronization.

This process is typical of much of the work Bonneville does for its agency clients. From the standpoint of smaller budgets, it is especially noteworthy. In the past, an announcer would cut audio prior to videotaping. After the video tape was shot, it would be a matter of trying to match video to audio; any coordination between sound and picture would be a fortunate coincidence. Now an announcer can cut copy directly to the edited video tape, matching nuance with nuance; inflection with appropriate action.

As Dave Michelsen explained, these applications can be performed using simple 4-track equipment along with a synchronizer. There is no need for 16- or 24-track capability at this level of operation, he points out. Bonneville engineers also have helped clean up audio recorded by the investigative news unit of a local television station — dialogue that had been recorded using hidden cameras and mikes. The possibilities offered by such procedures are nearly limitless.

A second use for audio sweetening that has proved valuable for the

. . . *continued on page 21* —

For additional information circle # 12

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THE COPYRIGHT JUNGLE

In the world of audio and video, the names Universal, Disney and Sony have become forever linked in a marathon legal effort to establish the freedom to record television programming inside the home for non-commercial purposes, without penalty or royalty payment. The decision on the legality of home video recording, by the U.S. Ninth Circuit Court Of Appeals on October 19, 1981, has reverberated around the world of video, audio, and motion pictures, and from the courtrooms of San Francisco to the U.S. Congress. The Appeals Court decided that the legal owner of copyrighted television programming has the right to protection from unauthorized recording and reproduction in the home via high-technology devices. This decision upset a prior lower-court ruling stating the principle of fair use previously established for home audio recordings, as being applicable to home video recording for non-commercial purposes.

The earlier decision depended heavily upon the provision for "home recording of sound recordings" contained in the copyright amendment of 1971, and in the new Copyright Act of 1976. Whatever the compromise in the Courts and the Congress to resolve the basic issues involving home video tape recording, the larger issues of new technology and the law remains unresolved. And there are obvious implications for the professional marketplace.

The original copyright law could not have encompassed the technologies of almost a half a century later. The limited revision of 1971 that granted some protection to sound recordings, and the general revision afforded by the 1976 re-drafting of the copyright laws, are as far from the technology of the Eighties as the original law was from the Seventies. The intensity of reaction from both the video recording equipment manufacturers, and the motion picture studio copyright owners, has surprised and alarmed the public. Record manufacturers have indicated strong interest as well, because of potential implications for audio.

All sides are dependent on the system: the artist, software producer, copyright owner, and home-video recording equipment manufacturer. Copyright owners spend tens of millions of dollars to produce electronic entertainment, and there is an expectation of return on that investment. The electronic manufacturers spend tens of millions of dollars on research and development to produce audio and video recording products for the home. There are millions of owners of home video recorders that expect to be able to use their machines in the privacy of their own homes; as they wish and when they wish to record what they wish.

The law currently treats ownership of copyright, and the physical tangibility of possession by the home video recordist, with attitudes that were set in the era of conventional media, such as magazines and motion pictures. One of the crucial arguments considered and rejected by the Ninth Court Of Appeals was applied to a landmark decision involving photo-copying of magazines (Williams and Wilkins Company versus United States). That particular decision held that countervailing social benefits could "weigh" against the copyright interests of the creator or copyright owner. With the current decision, the Appeals Court states its bias against new technology as an element that upsets the doctrine of fair use:

"New technology, which makes possible the mass reproduction of copyrighted material (effectively taking control of access from the author), places a strain upon the fair-use doctrine. A court, if it decides that fair use is applicable, is required to weigh — in 'balancing the equities' — the 'benefit' of an extremely popular increase in access, with the 'harm' to a plaintiff."

The court concludes that home-video recording is not a 'productive use' for society. The court's decision also seems to indicate a fear by the court that new technology has a potential for disturbing the copyright system.

The impact this decision has for the audio profession is profound. However, the threats lying in wait if no solution is found, or an inadequate solution is enacted, are so much larger that they threaten the continued forward motion of high-technology consumer entertainment.

Current action is taking place in Congress, with the Senate Judiciary Committee and a House Committee looking strongly at legislation which would specifically provide language amending the Copyright Act of 1976, to allow an exemption for home videotaping. Sony has asked that all home owners of videotape equipment be exempted, adding that the current judicial decision has made millions of Americans potential lawbreakers. The theatrical entertainment/software industry is also interested in legislation that would provide for the exemption, but would also grant royalties on the sales of videocassette recorders, and on the blank tape. (Interestingly, a blank audio tape surcharge system is already in use in parts of Western Europe, with mixed success.)

One problem is that royalties do not compensate fairly the home user whose video tape recorder provides program time shifting while the user is at work, or the home viewer who uses the machine to view pre-recorded tapes. The rental viewing of pre-recorded motion pictures and video pornography account for 50% to 75% of all home VCR usage. More important for the audio industry, the home VCR is the centerpiece for the combined audio/video home entertainment center.

Stereo television will depend heavily upon the emerging stereo VCR for stereo TV recording and playback. The home audio enthusiast will be able to use the VCR for the digital recording and playback of live music with companion PCM (pulse code modulation)

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—AUDIO/VIDEO—
RECORDING

— continued from page 16 . . .

BREAKING INTO THE VIDEO SWEETENING BUSINESS

company is translating programs recorded in English, into various other languages for distribution in foreign countries. One such project recently completed was a film production, entitled *Mr. Krueger's Christmas*, starring actor Jimmy Stewart. Upon completion of the film, which is scheduled for syndicated distribution later this year, the producers secured foreign television distribution. Thus began the long, involved process of translating the film's entire dialogue track into Spanish, Italian and Portuguese.

The project was assigned to Oscar Underwood, international productions director for Bonneville. It became Underwood's job to locate actors, studios and support services in the countries where dubbing would take place. (Among the people he encountered was an Italian actor who had specialized in dubbing Jimmy Stewart films — Italian style — for 40 years.)

Underwood or his staff would arrive in a country (Brazil, for Portuguese; Italy for Italian; and Mexico for Spanish) with a video tape copy of the film, which would be used as a visual reference for the actors. From there, the looping process would follow the industry norm: dialogue recorded on ¼-inch tape; transferred to full-coat mag stock, and edited; then returned to Bonneville for final processing.

Meanwhile, back in the U.S.A., a complete English version, including effects and music, had been transferred from 3-stripe mag film to 24-track. Once in this country, Underwood transferred the foreign dialogue to 2-track tape, one track being reserved for time-code. The two tapes would then be locked up, using the offset feature of the facility's in-house synchronizer — an Audio-Kinetics Q-Lock 3:10. The offset feature allows two tapes (audio or video) with differing time codes to be synchronized.

Using this method, engineers recorded the foreign dialogue on to the 24-track, one sentence at a time. To maintain perfect synchronization, both the English track, as well as the picture, were used to provide twin references. From there, it was a relatively simple process of transferring the three tracks to 4-track tape, and finally laying audio back on the videotape master.

"Of course," notes Michelsen, "this is done everyday in Hollywood using sprocketed audio film, and flat-bed editing equipment. We just took it one step further and developed some rather innovative techniques in the process."

Thankfully not all translation projects are as complex as was *Mr. Krueger's Christmas*. Most translation

. . . continued overleaf —

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BREAKING INTO THE VIDEO SWEETENING BUSINESS

assignments involve simple 4-track audio equipment, and a studio with permanent TV monitors. An actor reads from a script and matches his speech to that of the speaker, while watching the video and listening to the English version on a headset.

A third market for audio sweetening is the production of music tracks for independent musical producers. These tracks eventually wind up in commercials, films, industrial or educational programs. One recent session was recorded for a Christmas special. This particular program for 20th Century Fox Television involved the Mormon Youth Symphony and Chorus. The segment would be videotaped from the Salt Lake Mormon Tabernacle, notorious for its tricky acoustics. To alleviate the problem, the program's producers elected to record the group's audio prior to videotaping. The resulting 24-track master was enhanced, edited and mixed to the satisfaction of the production team. It was then transferred to 4-track tape, along with a 59.94 Hz video sync pulse, time code and click track.

Bonneville was then employed to produce a multiple camera remote in the Tabernacle. To further avoid possibility for error, all of the shots had been scripted in advance. The 4-track tape playback was resolved to the video system using the 59.94 Hz sync pulse, and played back over loudspeakers. The conductor took his downbeat from the click track, and the musicians and singers lip-synched their previously-recorded audio. In the end, the client was assured that the audio was of the highest possible quality. At the same time, audio was matched — and phase-locked — to the video, thereby ensuring proper time code between tapes.

Bonneville uses a similar process for other musical producers. One client often scores commercials. Time-code synchronization proves useful not only in saving time, but it also allows a producer to play an air-ready version of the commercial for the client, prior to the final mix. As a result, changes are possible during a stage at which they are easiest to make.

While the methods described here are relatively simple, Michelsen warns of certain pitfalls. One problem that arises occasionally involves the time-code signal itself. SMPTE time-code recorded on multi-track tape has a tendency to leak into an adjacent track, causing audible interference. The identical problem is sometimes present in the opposite direction — a horn or percussion track can sometimes bleed into the time-code track. The synchronizer-reader interprets this information as code, and attempts to adjust for it. But in trying to correct, the unit fails to lock into one steady speed. The lesson to be learned is simply to provide for a guard band between time-code and any other track.

Small problems such as these aside, its time-code system has helped Bonneville put sweetening as one of its top priorities, and has allowed the facility to put its audio production expertise to work for an entirely new market. Dave Michelsen points out that a studio outfitted with time-code equipment should be able to pull an additional hourly fee when used for that purpose.

"The markets for audio sweetening exist right here and now," he stresses. "Small and medium studios with just a minimal investment can expand their base to include producers of television and film programming. Our experience at Bonneville "proves that sweetening is not *just* for the big boys."

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THE COPYRIGHT JUNGLE

adapters. Of course, there exists a strong possibility of an emerging market for pre-recorded, PCM-encoded audio on videocassettes. None of this is going to have much economic attraction to the consumer if the VCR carries a $100 royalty surcharge, and the blank tapes are tagged an additional $6 to $10 each. The semi-professional audio recording market will also be impacted by royalties for digital use of VCR machines.

The point is that the royalty system does not fairly tax those who are perpetrating the violation of copyright; it taxes everybody, especially if there is a hardware surcharge. All of this translates into income or the lack of it at the recording studio level, as the burdgeoning stereo TV and stereo video business is stillborn by potentially negative consumer response to hardware and software royalties.

The fusion of cable television with high-quality audio delivery systems is beginning to provide stereo video music, such as the Warner-Amex 24 hour Music Channel, and theatrical features with stereo sound tracks. This marketplace will merge with the stereo VCR to provide enhanced home audio/video entertainment.

But consumers, faced with a higher price due to royalty on the already expensive stereo VCR, may well refuse to adopt a system that requires expensive tapes as well.

The difficulty with finding judicial or practical solutions to the provisions of rights for the home user, hardware maker, or software provider, is the virtually unstoppable movement of consumer technology for entertainment, education, and the provision of information. This copyright explosion is only the first salvo in a hardware/software battle that will have to ultimately encompass audio, video, computing, telephone, and video provision of information services.

Any solution to the copyright question has to address new technology; not decry it as being a "strain upon the fair-use doctrine." Audio/video engineers should be seated along with the lawyers, judges and legislators for all of the future bouts of the copyright-technology prizefight. □□□

The Visual/Music Marketplace

THE RECORD COMPANY VIEWPOINT

by Gordon Skene

While only three of the major record companies were contacted for their views and opinions of the viability and market potential of music videos, much of what they had to tell us is directly applicable to other major and independent labels.

"The idea of the video promo is kind of a misnomer," replies **Jeff Ayeroff** of A&M. Ayeroff, Vice-President of Creative Services, was quick to point out that A&M shoots the vast majority of their promos on film. "It winds up on video in the end product, but I would say that over 80% of our promos are on film, with the exception of concerts, which are almost exclusively on video."

The general consensus of opinion tossed the film versus video question slightly in the middle: Polygram shoots 80% video; A&M shoots 80% film; and Warner Brothers shoots about 50/50 The idea of filmed, or taped promos came largely out of its success in the European market. Both A&M and Warners have been involved in promos for overseas licensees since the mid-Sixties, but the idea to involve these promos domestically has, according to **Jo Bergman,** Director of TV & Video at Warners, "taken shape in the past three or so years." Asked why this sudden shift in emphasis, Bergman replies that "the avenues of exposure have opened. There are more places to use videos; between the syndicated shows, cable and clubs, the number of people reached have grown enormously."

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Polygram, on the other hand, is cautious about where they place their videos.

"We feel the artist, in lieu of performing at a venue live, should receive some sort of royalty payment from a club or cable channel for using a video," says **Len Epand,** Director of Creative Services at Polygram. "A lot of people are having trouble separating 'Art' from 'Advertising.' Polygram's position with regards to Promos is that they are artistic pieces, and not necessarily commercials to promote buying a particular album or single by a group."

An Aid to Record Sales?

And there rises the question of the effectiveness of the Promo. Does it promote sales? Is it directly influential in persuading a potential buyer to get the album?

Nobody really knows. As Jo Bergman put it: "There was a brief flurry of video in stores, which came and went with lightening speed, but there were a number of problems associated with that. First, there was the equipment; it was too complicated for the retailers. Was it getting the right exposure, or was it in an isolated area, was it hooked up to the big sound system? Were customers seeing it, or were the sales staff tired of seeing the same series of promos 20 and 30 times a day? All of that stuff didn't really work, and few people figured out ways of making it effective to record sales, so finally they just abandoned it.

"There was also a research project instituted that led them to the conclusion that video doesn't necessarily influence record buyers in the store. As far as other avenues being available, such as Syndication, Cable [The MTV: Music Channel from Warner/Amex] and Commercial Network, there is nothing at the present time indicating whether or not it is successful. However, The MTV Channel will *have* to employ some sort of audience measuring in order to stay alive."

Len Epand of Polygram has a different view regarding the viability of promos as a sales aid.

"When we put a video on a show such as *Solid Gold*, we know that the piece will be seen by an audience of between 15 and 20 million viewers. Even if a small percentage of those viewers were persuaded to buy the group's record, it would be a hit."

Jeff Ayeroff, however, is less positive about the sales connection.

"I don't think there is actually anybody who can tell you. Anybody who did is fooling themselves. I don't think there's been a survey done to show how successful videos are to selling artists. What you might be able to say is that, because the entertainment industry is a small industry in itself, and in turn it *educates* the public, there are videos that educate the industry about people within it, and who then in turn excite the public to in turn buy records. I would say it's successful in its 'domino' effect. How successful . . . I don't know. I would say though, that it's obviously the way of the future; anybody who says it isn't has got to be nuts."

Both Warner Brothers and A&M agree that commercial television is a sidelight to the real matter at hand: the blossoming home video market. The past couple of years have seen a steady stream of concert films and other performances showing up in stores on cassette and videodisk. Polygram is entering the market slowly. When we spoke with Epand, he pointed out that this question had been raised and, in fact, he was attending a meeting on this subject in the coming few days. Suffice to say that Polygram is interested, and it's almost certainly only a question of time before they enter into the home market.

Music-Video Formats and Costs

But what about the music videos themselves, or the Promos, as Ayeroff prefers it? What gets made? How much is spent? Who is chosen to shoot? Is it going to be a concert film/tape, or is it a story-boarded piece? We were surprised to learn that, in some cases, Warner Brothers employ the services of writers (something for the WGAW to ponder in the coming years). It is not just a case of someone simply pointing a camera and shooting, and in many cases the decisions don't rest squarely on the shoulders of one individual.

"When we decide to do a promo, it's generally the decision of a committee," says Epand. "This comprises myself; Bill Levy, the Vice President of Creative Services, who is in charge of over-seeing the production; Dan Young, Director of International, who polls the other Polygram companies around the world to get financial input, and also coordinate what they're doing with what we're doing; and Gunther Hensler, President and Chief Operating Officer of Polygram. It's been working out great, and we're able to produce far more video material than we might have been because we can get cooperation from Europe. Europe in turn will poll us as one of the International companies for financial contributions in videos that they want to do, when we plan to release an International product. By having joint financing, it spreads the cost around considerably. The average cost of producing a video will range anywhere from $10,000 to $50,000, and in some cases goes to $75,000 or $100,000."

By contrast, and perhaps indicative of the increasing emphasis placed on such tapes, CBS recently spent the believed unprecedented sum of $250,000 for the new Meatloaf promo video.

Both Warners and A&M put the average cost of a promo at between $25,000 and $60,000. It was not entirely clear, from their replies, however, if this sum was for one promo, or a series of different songs. The prices quoted were a somewhat sharp contrast to budgets for overseas promos. The average promo being shot in England costs in the neighborhood of $10,000 to $30,000 and, in some cases, figures were given for a *series* of promos for one artist. (Those figures were accurate as of June this past year; owing to inflation, as

The Marshall Tucker Band as they appear in their new Warner Bros. promotional video which features two tunes from their current album release "Tenth". The video highlights the songs "Silverado" — in which the band members shoot it out in a Western gunfight — and "This Time I Believe." Pictured from left to right: Jerry Eubanks, George McCorkle, Paul Riddle, Franklin Wilke, Doug Gray, Tony Caldwell.

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everything, they have probably increased.)

The variance in budget also takes into consideration the popularity of a given artist.

"We generally spend less for a first-time artist than we would for an established one," says Bergman. "But the bottom line is whether or not they are a *visual* act."

Ayeroff agrees: "There are some acts you can't film, because they simply don't translate to the screen; they're not visual."

"If a new act starts getting a lot of airplay and moves up the charts, we'll do a promo," Bergman adds.

A simultaneous video promo and album release, apparently, is only considered with more established groups.

What about the role of the artists in the creative process?

"Some acts are aware of the visual medium; they know what the technology is all about . . . they have a hand in the process, but there is no set of rules, says Bergman. "The manager usually has a point of view, the artist has one, and we do. If we can agree on what the basic idea will be, as well as what the material will be, then we go from there. Sometimes we'll have an artist who must work with a certain director, period. But otherwise we'll put it up for bid by a production company."

Asked if there was any validity in the rumor that some production companies were "stuck" doing low-budget promos, and not given an opportunity to do higher budgeted shoot, Bergman emphatically denied that this was taking place.

"No. Absolutely not. First of all," she stressed, "we don't do that many low-budget presentations. Something relatively low-budget is probably going to be a live shoot, very simply done, maybe at a club where it's live-switched and, as a result, relatively inexpensive. For something like that, yes, it is a case where there's a staff of people who do that best, and you would probably think twice about using them for a concept piece; simply because that's not what you perceive to be their best suit. We don't divide companies up by budget, except in that one case."

It was universally agreed that, with very few exceptions, promo-video projects were thrown up for open bid to most production companies currently shooting video projects.

Potential Markets for Visual Music

The video is done. Now what? Aside from the obvious avenues of commercial TV, cable and clubs, is there a marketing strategy employed? Is this project to be run by the record company like an ad campaign, or will it be given the proverbial "Throw it against the wall and see if it sticks" treatment?

"There is a marketing strategy," declares Epand. "It varies from artist to artist, of course, and it also depends on what is required."

Many videos are employed as a means of breaking a group or individual while touring, he explains. "Consider a group whose itinerary leads them to Boston, for example. We'll try and place a promo on the local channel prior to the group coming into town to generate interest from the audience who might not be aware of them."

Coinciding with Ayeroff's "circular awareness," or variant of the domino theory stated earlier, Epand pointed out that video promos are being thought of more as a potential tool to break artists, where the former means, radio airplay, is severely falling down.

"Radio playlists are getting tighter than ever," Epland considers, "making it virtually impossible for a new act to break on radio alone. Also figuring in this is the increased costs of touring."

There was a time in the not too distant past that groups would tour almost constantly in order to break. A prime example that comes to mind is the story of ELO. After touring the U.S. almost non-stop for roughly two years, they finally broke into the American market. Today, however, that strategem is financially unfeasible. Consequently, there is a justification for an expenditure of upwards to $75,000 for a film/video promo.

Role of the Recording Studio

What about the question of a recording studio interfacing in the promo field? There has been a trend in recent years for studios to set up video facilities in-house. Most everyone to whom we spoke was rather cool to the idea, citing more favor towards "concept pieces," as opposed to staged studio setups. So before a studio considers spending an additional $3 million for a video facility, it should think about its cost-effectivness. Remember, there are a slew of small and large video facilities and companies now in the business, and not making a go of it. Also the rate of technological advances makes obsolescence a twice-yearly thing. Regarding the question of the "concept piece," there have been some recent grumblings about videos being popular with audiences, but not enhancing record sales. A recent item in *Billboard* regarding a new promo by the band Visage indicated that the promo was so good that nobody knew who or what companies it was for. An album? Really?

Epand, acknowledging this potential hazard states that, in future promos, a concerted effort will be made to visually identify the band, the current album, and the record company issuing it, probably at the tail of the clip, where it is customary to run credits. There will probably be a credit for the film/video production company as well, since some companies are establishing themselves for a certain style of visual presentation.

However, in defense of the *Billboard* statement, Epand says that "Putting a promo video out in a club or in retail without something coming on saying 'Visage. Polydor Records & Tapes', means that the material is kind of lost on a lot of the customers. On the other hand, we have noticed sales going up for Visage. In fact, in Europe Visage broke through video, because they're a non-performing group. The showing of the video brought them to number one in Germany, U.K., Holland, and France. In Germany, a lot of advertisers prevented that video from getting used on TV, which partially hurt the record. They told the TV stations that they were giving free advertising by playing this video tape, while they [the advertisers] were paying for airtime. And that's a new and interesting problem."

Art versus Advertising

Which brings us back to the 'Art versus Advertising' problem. At present there are no conclusive answers to this question, and the problem hasn't surfaced in the U.S. yet; it may never come around to that. If it does emerge, the potential conflict could pose some interesting problems, and perhaps a dramatic reassessment of where video will go. Will it become more firmly entrenched in home video, or will promos start taking on the look of ad campaigns?

There are probably sufficient difficulties inherent to the production of a promo itself, without worrying about possible future problems that may never arise.

"I think there is the inevitable problem with being too ambitious," warns Bergman. "Which results in being too close to, or over the wire on the money. I would say most companies are fairly well prepared, but that's always a probem — going into something before you're absolutely nailed down as to what exactly you're going to do, and why. Some record companies are good at 'winging it'; some are not. Some situations can be done that way, and you can anticipate some of the problems in front, but not always.

"Sometimes an artist wants to be more involved in a piece, and may or may not have the experience to be involved. So that can be time consuming or expensive. Don't get me wrong, I think it's helpful to get an artist involved. If they know what they're doing, and know how to work with a camera, generally speaking they're going to be better at it. They can, of course go the other way, in which they immediately think that they know as much about film and video as they do about 24-track recording, and that's not always the case.

"On the other hand, it's important for artists to become involved and to work

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with people who know what they're doing because, first of all, they'll look better, sound better, and they'll become more used to the technology. And the more they understand the limits of the technology, the easier it will be for everyone."

Ayeroff sums up the situation in somewhat more simplistic terms: "A lot of artists and managers fancy themselves as C.B. DeMille's, and . . . well," he says, pausing and adding an all-knowing resignation to that last "well."

Another recurring problem when budgeting a promo video is something that simply can't be avoided; the error in judgement. Was it really wise to spend that much money on that particular group or artist? Should we have spent more? Did we use the wrong production company or director? All of these factors are just part of the problems faced by those making promos. If one considers the burgeoning industry of video/film promos alongside the motion-picture industry, you could be dazzled for hours with an endless list of similarities.

Towards The Future

What about the future for promos? Having posed the question, we were faced with a wide spectrum of feelings, ranging from cautious optimism to unbridled enthusiasm. No one doubted its place and its continuing growth, however.

Jeff Ayeroff: "Ours is an industry that, if you have the tools, you're an expert, but there are no experts in the entertainment industry. I'm beginning to get tired of the continual clamor to video; it's starting to remind me of the scene in *The Graduate*, where the guy walks over to Dustin Hoffman and says, 'Plastics'. If that film was done today he'd say: 'Video'.

"I think it'll cool off after a while, but the bottom line is that a promo film is a *billboard;* the right video will sell the right act. A great video isn't going to sell a record if it isn't going to sell traditionally as a record. We're not at the point now where videos are making the record. If the record's there, and you then make a great video on top of that, then it helps sales. But if the record ain't there and you make a great video . . . who cares? It's still the record business; these are just ancillary pieces. The real test is whether or not Home Video is going to take off."

Len Epand: "It's beginning to feel like everyone's going to be living in a plastic dome and watching television. Polygram's involvement in doing videos began around 1976. It originated as a substitution for an artist's ability to get on a TV show. If an artist couldn't make it on, say *Midnight Special*, because of other commitments — such as a European tour — they would do a video. If fact, it was done in very few cases, and only with artists whose records had certainly Top-40 potential, but mostly in the Top-20. At that point, back in '76, everyone took a cautious approach, but we were in there right away.

"At that time though, video was defined as a *performance*, not as a record or a concept piece; at least by the modern definition of it. At the time the cable industry hadn't gotten that prolific, although we were still producing videos. In fact, our production had increased. Around that time companies would pop up: Rosenman Productions, for example, came up with the concept of the 'Video Jukebox' [shades of The Scopitone, no doubt?], and were putting them, as a package, on broadcast shows. They paid all the rights to the appropriate sources, and then shows like *Midnight Special* started. We have found this to be an effective sales tool simply because of exposure.

"Video is one of the most dynamic mediums there is. With the increased cost of touring, and the problems on the concert circuit, the drain on the entertainment dollar, the proliferation of new medium . . . it not only hurts the concert scene but it also affects record sales. We're exploring ways right now of making video an income-producing portion of our business for both us and the artist, through Polygram Television.

"As far as the negative side is concerned, I don't really see anything. We have a great roster of artists, and there is great optimism in Polygram. In answering the critics, I feel that just because you can't quantify video play to a record sale, it doesn't mean the audience isn't influenced. I hope one day we may be able to marshal forces to break records via video."

Jo Bergman: "I think there's going to be a lot of work that needs to be done before anybody understands what we've been talking about. We are so early in our development — such an early stage as far as music in the video area is concerned — that serious marketing in home video will take at least another two years. Until there are machines out there, and people start buying, it's all wait-and see. When that happens, the material that will be developed will be quite different from the material being developed now for the cable market. But by that time a lot of this extremely necessary but ofttimes unimaginative development will have been worked out to such an extent that we will be able to have musicians working with writers, directors and producers, so they can actually create things for the medium.

"There will be more avenues of creative work, such as the work of Russell Mulcahy on the Ultravox *Vienna* promo; although I feel he has a tendancy to concentrate more on his 'style', making the group and the song somewhat secondary. His work is stunning, but that's *his* work. In the case of the Kim Carnes' *Bette Davis Eyes*, where the song was strong enough to make the impression . . . you really remembered it. Mulcahy's work is fabulous, but I don't think that it's anything that's actually going to sell the artist or the music, because I think it's totally irrelevant to *his* creation.

"With the question of record companies getting involved in in-house production, setting up in-house facilities, RCA tried to do it, but after a while everything was the same, and you can't do that where the artist is concerned."

One of the main problems confronting video production facilities is keeping up with technological advances. The record industry is in such a state of flux right now that it would be inadvisable for anyone, unless for purposes of a tax write-off, to risk such an expenditure. For example, there was a story circulated recently regarding the NBC News Bureau in Washington, D.C., and its changeover from film to video. It was said that NBC spent somewhere in the neighborhood of $4 million revamping their news gathering facility; switching from the somewhat antiquated 16 mm sound-on-film medium to ¾-inch video cassette. The system apparently was in use for a period of six months before it was realized that ¾-inch was now obsolete, in favor of the new, more advanced 1-inch video systems. Four million dollars is not a lot of money where NBC is concerned, but it could prove to be financial ruin for anyone of lesser capabilities.

A&M has its own in-house facilities, but it uses them for other things. In fact, the facilities are managed by Kramer-Rocklen, but from A&M's point of view it's there anyway and has been for quite some time.

Ayeroff, when asked about the former Chaplin Studios facility, explained that A&M Records uses it only occasionally, and that it is booked by mostly outside companies shooting everything from TV Spots to Game Shows.

"It's interesting now," Bergman continued, "but I think it will be *quite* interesting in a couple of years. By that time we will have gone through all of this heart-rending positioning, figuring out, and shake-down, and everybody knows what's going on. It doesn't make sense at the moment, however, and I think that it's very difficult for record companies right now, because you're talking to people who are used to *listening* to things, not to *looking* at them. And they are not necessarily persuaded that looking at a band is better, in terms of marketing.

"I totally understand that, although it's important to recognize that this is another aspect of a performer's creative work, and we *should* be involved in it. But it's something that some of the record companies will understand, and

. . . continued on page 32 —

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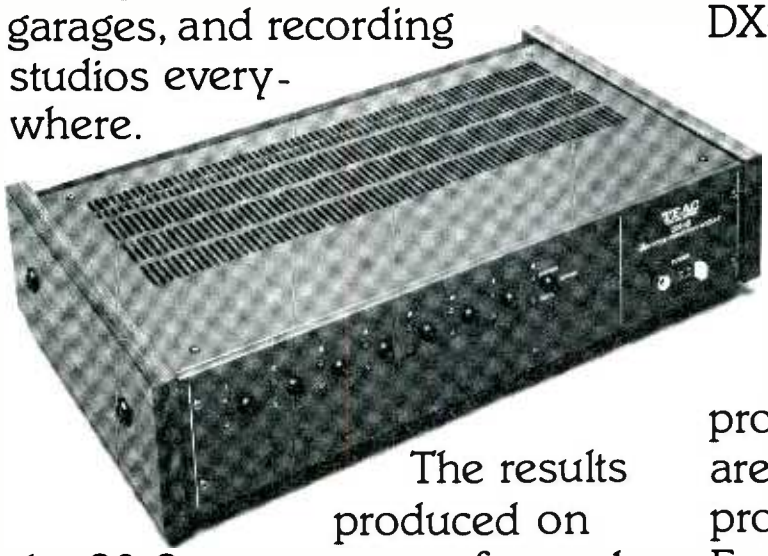

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TASCAM STUDIO SERIES
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— continued from page 28 . . .

Visual Music . . .
The Record Company Viewpoint

some of them never will, and that's it.

"With regards to the *MTV: Music Channel*, some people have commented: 'Who wants to watch radio?' I think that they're missing the point entirely. It's equally as disturbing as the people who don't understand why visual-music has taken all this time to develop, and now they think it's all about to happen. But it is *not* 'all about to happen'; not this year, not next year . . . maybe in a couple of years from now. The kids are going to define it. They'll do it with interactive computers, and they'll be using videodisks. It'll be created differently. The really exciting video material will not be coming from the record companies, it will be coming from Atari.

"One day, maybe soon, we're going to think of video promos in the same way as we think about Scopitones: curios. But it's wonderful as a testing ground for artists, directors, producers, writers, everybody. Because they can do it all in a relatively inexpensive area, compared to TV or film."

It's interesting to consider the present market for visual-music pieces as being a "testing ground" for new talent, and equally fascinating in light of recent events that have taken place. A&M, for instance, has announced the formation of a Motion Picture and TV Production division. The same goes for Arista. Polygram already has its own TV and Film wing. Whether the eye is on TV, film or the cable market is, as yet, unclear. It *might* be a worthwile moment in passing to think about the sudden interest in promos as representing a smoke-screen, more or less, for bigger things. As far as talent being spotted, a rumor was circulated that promo-director Russell Mulcahy has been approached by Martin Scorcese regarding possible future feature film work.

There is feeling afoot, however, that even after such a short gestation period, the video promo has become a dinosaur; bereft of enthusiasm and succumbing to flabby concepts that no longer work. Almost certainly the problem is not so much in the productions themselves; one can make a convincing argument, however, that cable, like radio, is the real culprit, since it is not necessarily the alternative everyone thought it was going to be. Cable is run by people with less imagination and foresight than radio. And the outlook for radio, as we all know, is bleak.

The whole question is one that needs sorting out. At this moment there are no answers. There is optimism, however, which ranges from unbridled to cautious. No one has declared the Video Promo dead. At least not this week.

□□□

news

UNITED WESTERN SCORING SERVICES OPEN

The new division of United Recording Corporation, to be known as United Western Scoring Services, Inc., will be devoted to scoring for the motion picture and television industries.

"We have created an autonomus division which can work with the various guilds and unions of these industries," Jerry Barnes, vice president of recording, explained, "in the most up-to-date scoring stage in Hollywood. We took the historic United Western Studio One, where most of the greats from Crosby to Sinatra to Manilow have recorded, and converted it for scoring.

"The studio is still ideal for making records with large groups," he continued. "The acoustics are the same, and you can still seat a 60- or 65-piece orchestra on the floor. The only changes are the addition of a fully equipped projection booth, and one of the largest wide-screens you'll find in a scoring room anywhere."

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NEWS continues on Page 134 . . .

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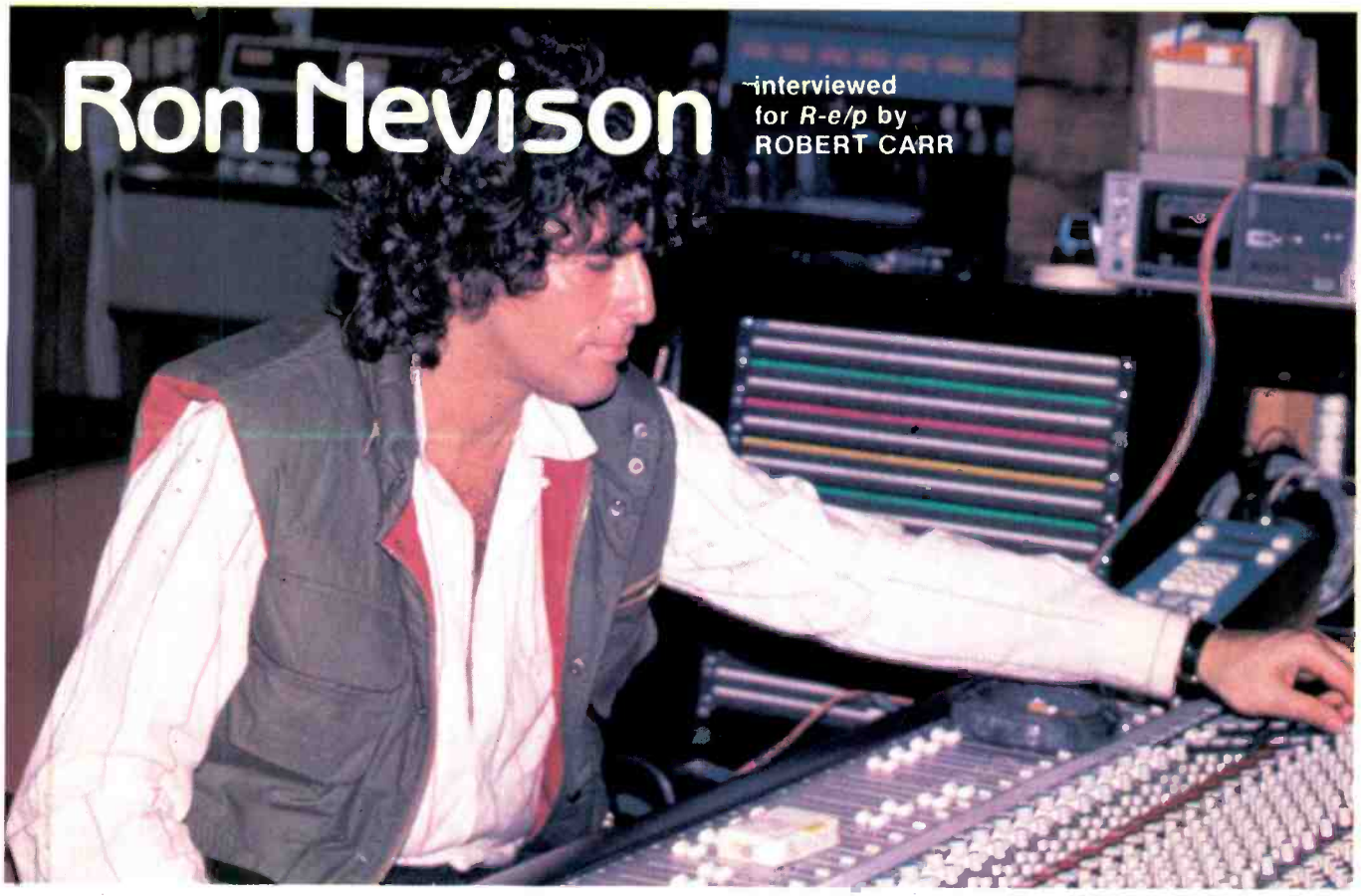
For additional information circle # 20

Ron Nevison

interviewed for *R-e/p* by ROBERT CARR



Photography by Jeffrey Mayer

Ron Nevison entered the music business as a live sound mixer for Festival Group, based in Philadelphia, during the latter half of the Sixties. After touring with acts such as Jefferson Airplane, Traffic, and Eric Clapton's Derek and the Dominoes, he was admittedly "burned out with life on the road." Excitement and promise of the English music scene lured Nevison to England in 1970, where he gained a wealth of experience engineering for The Who (the *Tommy* soundtrack and *Quadraphenia*), Bad Company, and Led Zeppelin. Returning to the States in 1975, his association with Gary Kelgren, co-partner in the Record Plant, led to production and engineering assignments with Dave Mason, Eddie Money, The Babys, and UFO. *R-e/p* caught up with Ron Nevison at The Los Angeles Record Plant just after he completed Jefferson Starship's latest album, *Modern Times*.

R-e/p (Robert Carr): I notice that most of the sessions you do are predominently hard rock. Do you feel that's your specialty?

Ron Nevison: Yes, that's my specialty, although the Dave Mason album couldn't be described as hard rock, and I have done other things. But generally, yes, hard rock is my specialty.

R-e/p (Robert Carr): Where does that stem from?

Ron Nevison: I guess it stems from my live mixing experience. Early on I got involved with groups like The Who, Led Zeppelin, and Bad Company, who were hard rock groups. I made a name for myself in that area, but I have tried to branch out a bit.

I think I do get into areas other than hard rock. I don't do R&B; that's a totally different production technique. There's an inherent danger that a lot of people run into in this business. I've seen some very strange pairings of artist and producer that have worked very well. But some of them — I won't mention any names — are doomed from the start. They get into areas they shouldn't.

R-e/p (Robert Carr): In the sense that the producer and artist do not have a rapport or empathy with one another?

Ron Nevison: They don't have an understanding of what's required to produce music outside their chosen specialty. I'm not going to take my style, put it into a different type of music, and try to make it work. The producer has to adopt the artist's style. I see it happening over and over, where a producer tries to use his "successful"

> ***Producing a group is totally different than producing a single artist . . . the producer has to adopt the artist's style . . . but just because somebody can cut music on the road, doesn't mean they can cut it in the studio!***

When he was 16, Humberto moved to the U.S. from Chile, where several of his relatives were successful singers. He worked on an assembly line for a while, before wandering into MGM Studios. A year later, when an engineer got sick before a major session, Humberto was the only one around who could get the job done. He's been getting the job done ever since for an incredible variety of people, from Debbie Boone to Alice Cooper, as well as Frank Sinatra, Sammy Davis Jr., Steve Lawrence, Tony Bennett, Shaun Cassidy, The Osmonds, David Bowie, Denise Williams, Gladys Knight, Bill Champlin, Lee Ritenour, Hall and Oates, Leo Sayer, The Average White Band and Bernie Taupin, whose album he produced.

ON RECORD BUYERS

"When you make hits, you have to think hits—14, 18, young. The people have to be realistic. How many albums is a 27-year-old guy going to buy, as opposed to a 15-year-old? I mean, you go to a record store. Maybe a 16-year-old is going to buy four albums. A 23-year-old is going to buy one or two—he's very picky. He might buy very specific groups that he likes. He might follow critics. When you make records, you have to think kids. Those are the guys who buy the records."

ON RETAKES

"I hate perfect records. You cut the basic track, the vocals, and then the producer goes all the way back again. He starts replacing the drums. And then he replaces the bass, because the bass doesn't feel quite right. And then he starts doing the keyboards again. So that by the time he's finished, he's done it all over again. If it's not right, I understand. Let's do it all over again. But when you start patching things that already have the specific feel in there—that 'something' that has already been printed—you can hear all the human things that are all there for the first time—I don't want to be a part of that. I have been part of one of those and it just drove me crazy."

ON NOISE REDUCTION

"I don't use any noise reduction. I never use it, either when I'm doing tracks or when I'm doing final mixes. They really affect the music. They affect sound in general. To me, the punch is all gone. The drums sound different. The vocals sound different. The keyboards sound different. I can hear those things and it really bothers me, so I don't want to be a part of it."

ON TAPE

"Since I started with MGM, we always used Scotch. Only once, I've experienced a different brand of tape. And I was very disappointed. And I had a serious problem. It got so bad, like in the middle of the mixes, the tape started giving up—heavy drop-out in places. And then the tape started peeling. Not on the outside. It was giving up on the inside. I mean, I was doing a mix, and halfway through the song, the whole top end disappeared, like someone threw a blanket on top of the speaker. So we mixed about halfway through the album. We mixed in sections. We cleaned the heads all over the place. We did the introduction. Clean the heads again. We don't want to take chances. I wouldn't do a project with any other tape besides the 250. I have done the past 20 albums, the past 30 albums all on Scotch. It gives me what I want, and what I want is a real clean taping, punchy bottom end, very little hiss, almost none. You have to try things in order to know if you're doing the right thing. If you don't try, you'll never know. And I have tried, and the results have been different."

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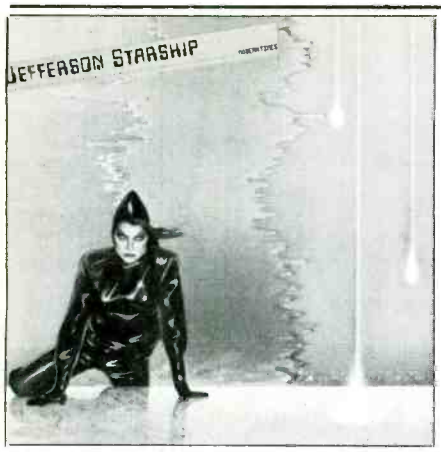


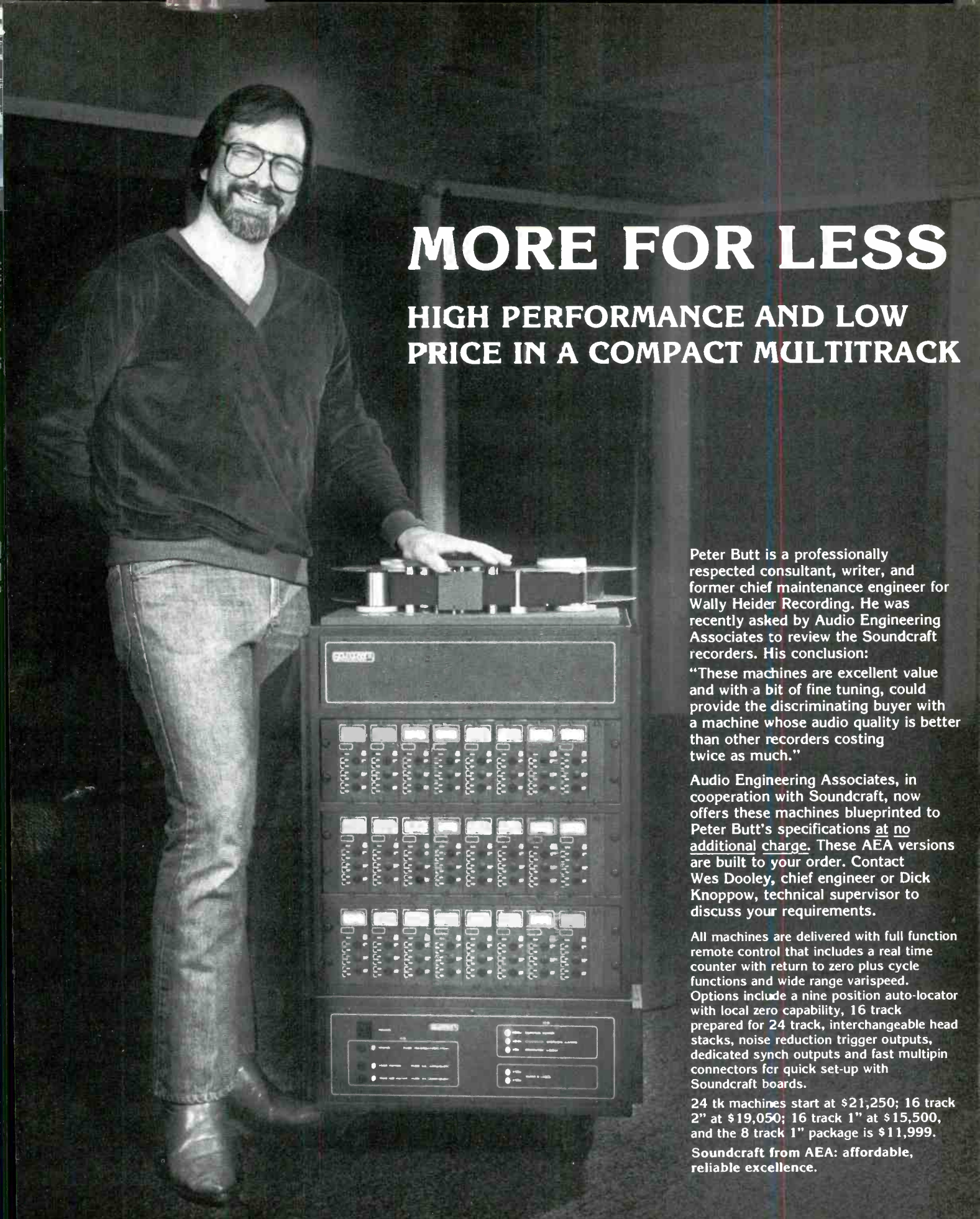
formula on another style of music, without realizing what the group does best. The producer has to segregate a "style" of music from a "sound." For hard rock you have to present a *powerful* sound. You can't take that into R&B, where the sound is much less ambient. It's a different technique.

R-e/p: Are you referring to something like mike placement, for example? Wouldn't what you're saying necessarily apply to pre-production techniques, or mixing techniques, as well?
RN: Certainly. It would apply all the way through a recording session. What you hear on the record is, yes, more mike technique than psychological warfare. But you're dealing with people, and the style of music they're playing. It gets down to tailoring a production approach specifically to all levels of the project you're working on.

R-e/p: Don't you feel you have a pretty basic way of producing a group, or artist, that you follow all the way from pre-production, through production, to the mixing process?
RN: No, I don't think so. Well, in basic terms . . . yeah. But I think my approach is flexible enough that it changes for each individual or group. Producing a group is totally different than producing a solo artist. Someone like Dave Mason, for example, has a group that he tours with: The Dave Mason Band. If somebody in the band doesn't cut it, he's dispensible; you simply bring in somebody else. It's the same thing with material, because there's just one writer in this case.

If you're dealing with a group like Jefferson Starship, however, where you have three different writers, and you have to work within the self-contained format, there's no question that you go into the project with the idea of making it work as the group. That changes your pre-production — your outlook on the group, and the project as a whole.

A lot of times you have a situation where a producer has to make a deal with an artist or group months and months in advance, without ever hearing any material. You have to make the decision to do the project on



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past performance, in the same way that a group has to choose the producer on past performance.

R-e/p: Such as with Starship, for example?
RN: Right. They're unique, because they have a lot of writers. In most cases, groups have one main writer and maybe one auxiliary writer. But not three, where they're always providing a lot of material. In fact, with the Starship, we had *too* much material. I had to hold a secret ballot to determine which three songs the group didn't want on the album. That way the selection wouldn't openly conflict with anybody else's opinion. It was a concensus of what songs everybody liked, without anyone actually having to say so publicly. I was the only one who wasn't writing. Everybody else was involved in that.

R-e/p: Was the situation that sensitive?
RN: No. I don't want to be misconstrued. Obviously, the democratic approach is the best way to make decisions within a group. At least that's what seemed best in order to find out what everybody's feelings were, without anyone actually knowing who voted which way. We all had a vote — the band, the manager, and myself. We all decided democratically. I don't know if you can call that sensitive, or just sensible. But let's say that it's more *accurate;* I got a more accurate sampling of what everybody thought the album should be made up of.

R-e/p: I get the impression that working with Eddie Money was kind of touchy, but in a different way. What was that project like?
RN: Actually, Eddie Money brings up an interesting point. When we started that project, *Playing For Keeps*, Eddie wanted to use in the studio the band he was going to take on the road. Now just because somebody can cut the music on the road, it doesn't mean they can cut it in the studio. There's a certain experience — especially with the rhythm section — that has to be gained beforehand, in order to make the actual recording process easier.

But the drummer didn't have that much experience in the studio, and that can be difficult, especially when you have an artist that expects big things of the producer. It's dangerous! It's much more dangerous than an unknown artist situation, because the known artist expects more from you in terms of a more successful album.

But, by the same token, I had to go along with Eddie on his decision to use his road band, because I had to make him feel comfortable. As it turned out, we had to recut a lot of the tracks. It doesn't mean though, that I was right at the start of the session. There was enough chance at the beginning of the project that I could be wrong about the players' abilities, and I didn't want to take the chance. I had to let the situation happen, which involved extra costs.

Eddie had been wanting to use the drummer for a while, but every producer he'd worked with would say no. Frankly, after rehearsal I didn't know whether the band would cut it or not. But I felt that I could *not* not give them the chance. The band was eager, and a lot of times that's more important than anything else; they were enthusiastic about the project. As it turned out, the drummer wasn't quite good enough for what we wanted. Although he was good, we did have to do things over, but I won't go into specifics.

So there's a situation where you have a solo artist that also has a band. It would have been nice to go into the studio and have it work immediately. But it didn't happen that way, and it cost us some time and money.

R-e/p: Who was the drummer on "Trinidad," from Eddie Money's Playing For Keeps *album?*
RN: That's a drummer by the name of Gary Malabar, who we wanted to use

anyway. The song was written partly by Gary, Lonnie Turner [bass player], guitarist Greg Douglas and, of course, Eddie. That was a turning point in the album. When we cut that tune, we realized we had to cut some of the other ones over, because that was what we were going for.

There comes a time when you establish a kind of cornerstone; you get to a musical level that you've been shooting for. Then you have to bring everything else, if you can, up to that standard. That's what happened. When we got that track, we were so pleased with it that we redid some other things to bring everything up to that level.

R-e/p: To me, the sound on the drums was very open. It didn't sound like a very close-miked set.
RN: No, it wasn't. But it sounds closer to me than it did originally, when I first listened to it about six months ago.

Eddie had very definite ideas about echo. He didn't like it, especially on his vocal. I'm more liberal with echo, because a lot of it gets lost, or disappears altogether on a record. That wasn't a point I could get through to Eddie. It sounds like a line you're giving somebody: "Well, it won't be as much on the record." Sometimes you can talk your head off, and what you say just falls on deaf ears. Eddie's that kind of guy; I couldn't get through to him.

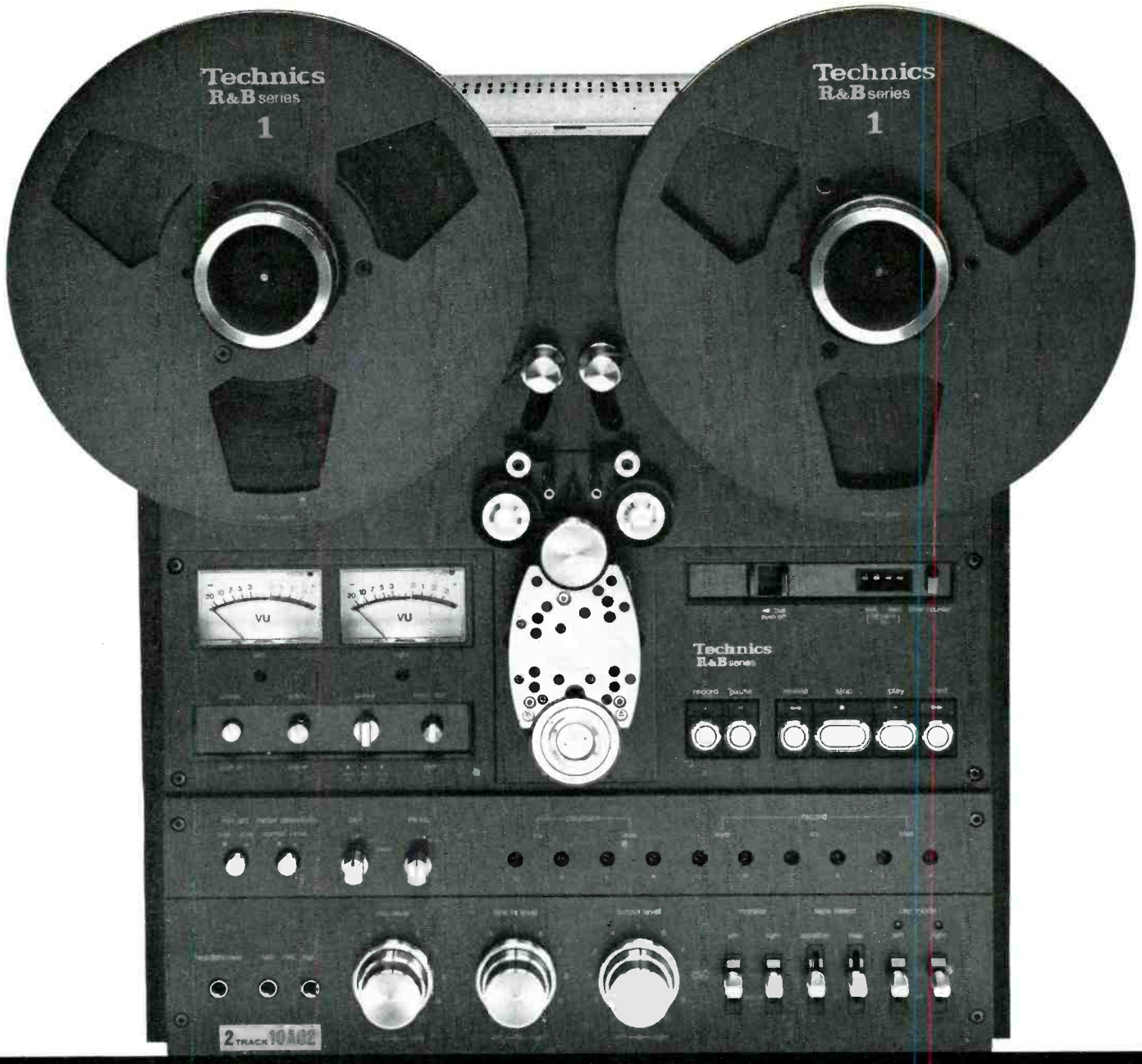
R-e/p: Did you use more of a room sound on drums, rather than artificial echo or a DDL?
RN: I did kind of the same thing that I usually do. I've been using Studio C at the Record Plant for years, and as Mike Clink [associate engineer] can tell you, I always record drums a little bit differently every time. I like to fiddle around looking for a more unique sound for the particular project I'm doing.

Basically, I had the drums set up on the stage. Studio C has a raised marble stage about 2½ to 3 feet high that runs the entire width of one end of the room. Surrounding the stage are glass walls covered by heavy drapes. It gives you the option of setting up any kind of acoustics between super live with the curtains open, to very dry with all the drapes closed. It's impossible to say how I recorded any specific drum track. Sometimes I had the curtains open; sometimes I had them closed; and sometimes half open. Sometimes I used a stereo mike in the corner of the room for ambience, and added varying amounts of that in the final mix. It just depended on what worked.

R-e/p: Doesn't having a marble stage for the drums make the sound a little too *live?*
RN: Yeah. I put down a rug that's maybe about 10 by 12 feet. The drums seem to couple better with the room when they're up in the air like that. They also seem to be up in the air in the mix; I can actually feel them up in the air. I don't know if it's visual or what. The stage doesn't particularly give the drums a bigger sound, but it can make the drummer *feel* bigger — more like a performance.

R-e/p: Are you very concerned about instrument leakage?
RN: No. Even if you have gobos around the instruments — depending on how loud they are, and whether or not it's a big, live-ish room — there's probably going to be a lot of leakage. The ambience mikes will pick up the drums, because they're more powerful. However, the leakage you get actually adds to the guitar sound, as well as the drums.

R-e/p: Is the diagram we'll be including in this article representative of the way you usually mike drum kits, or is it an example of a particular style or sound for Jefferson Starship?
RN: More or less, and no. The setup and microphones depend on how the drum kit sounds. That's the biggest question mark — the drummer. For instance: Gary Malabar [drummer on Eddie Money's *Playing For Keeps*] came in with his drums and, as I remember, I



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replaced the whole kit. His kit was all "studio drums," with tape and so on all over them; they looked like they were ready for a museum. What I wanted was just a plain, brand-new kit, ready for the stage, which is what we had at the Plant — a stage. Gary was professional enough to go along with me on the decision and, I think, he was very happy with the results. That's the difference — getting somebody who isn't intimidated if you take away his drum kit. Now, that's a major thing, but he was interested enough, and professional enough, to go along with me. So was Cozy Powell, drummer with the Michael Schenker Group.

The biggest "X" factor for recording drums is the sound of the drummer *away* from the kit. It's the balance that he gets with himself that an ambient mike will pick up. This is really the most important fact. If the drummer doesn't have a balance with himself — if he's really hard on the snare and light on the kick — then it's impossible to get that big sound I like to get, because it just doesn't sound that good away from the kit. You can almost put one mike in the room with a hard rock drummer that has a really good, balanced sound, and good-sounding drums. It's much more up to the drummer and the drums.

R-e/p: Was that the case with Zeppelin's John Bonham?

RN: That's the case with everybody, but my experience with John Bonham is a very good point. He'd break my hands if I put a mike closer than 9 feet from his kit. If I tried to put up a bass-drum mike . . . forget it! Putting a microphone there didn't mean I was going to use it, but having a kick mike just in case is a good practice. John really forced that sound himself.

R-e/p: How many mikes did you use to record Bonham's kit?

RN: I recorded him with two Neumann U-87s, cardioid pattern, about 12 inches apart, with one microphone between six and eight inches above the other. This was for the album *Physical Graffiti*. The recording was done in a house, and the mikes were up near the second floor, about 20 feet high, hanging over a circular staircase. The two 87s were looking down, and a little off to the side. We tried different positions, and that was one of the placements. In the mix, the two tracks were positioned extreme left and right.

R-e/p: Getting back to the Starship room layout, why do you have a stereo mike in the corner?

RN: The AKG C24 stereo microphone is used primarily for ambience. It's not conventional, but it sounds good. I chose the stereo AKG, because I like the additional bottom I get, and additional stereo effect. It just seems to work.

The pair of AKG C452s in the room were also used for ambience. I just mixed them right in the middle with the drum track. I don't usually use both mikes at the same time — only one or the other to give me control over the depth of the drum sound. Occasionally, I'll put the most distant 452 on a separate track, and mix it in later if I like the way it sounds. The one closest to the drums I may bus to the drum tracks while I'm recording.

I'll use about 10 tracks for the drums, if I'm going with 48 tracks; on a 24-track system I'll use less. It really depends on the drummer and how he plays. I like to mix the toms down to two tracks, and put the overheads with the high-hat and ambience together on two more tracks. I always have a spare bass-drum track in case one fails. Aynsley Dunbar [Starship's drummer] has two bass drums, so I have three bass-drum tracks — two for the main bass drum, and one for the secondary bass. I'll route the E-V RE-20 for the main bass drum to two tracks — one on the edge of the tape, and the other in the middle. Sometimes they'll sound differently. The information on the edge track isn't always as accurate as that in the middle, but it may give me a sound that I like.

R-e/p: When you start to do a mix do you work with the drums first?

RN: I always start with the drums, and build all the other instruments around them.

R-e/p: Is the mixing process a visual perception for you?

RN: No, I have the drums right across; that's one of the reasons for the stereo mike. The drum tracks are not really panned — most tracks are full left and right, or in the center. The only thing panned is the tom-toms, set full left and right at 7 and 5 o'clock. The snare and

A Conversation with MIKE CLINK — Session Engineer for Ron Nevison

Mike Clink has been employed by the Record Plant in Los Angeles for about six years, and engineering with Ron Nevison for the past four. With more and more engineers setting their sights on producing as well as engineering, Mike Clink can offer some insight into the question of maintaining a healthy relationship when working with an engineer/producer.

How do you view your working relationship with Ron? we asked.

"It's a team — an efficient, time saving team," he offers. "Once you build a rapport with someone, you don't even have to say anything during the recording process; you know each other so well that that kind of communication isn't necessary. Plus, Ron doesn't have to reteach his recording philosophy each time he goes into the studio.

"If he's running late getting to the studio, or there's mention during the session about recording an acoustic guitar next, I'll know how to set up the studio the way he wants it. I know the mikes he likes; the track assignments he normally uses; the limiters to have ready; and so forth. In addition, I have to be an overseer — keep an eye on levels, and keep track of where the parts are on tape."

Is it advantageous to work with as many different production people as possible, or does he prefer working with a select few?

"In the beginning of my career, I worked with about 50 different people," Mike recalls. "I also got the chance to work with guys like Andy Johns, Bruce Botnick, and John Strohnack, before I settled into working with Ron. I think those guys are the best in the business. Over the years, I've gotten the chance to pick up the best techniques from all of them. My sound is their sound, and that's an advantage. If someone wants me to do an album, they know I can get a 'Ron Nevison sound', or an 'Andy Johns sound'."

Is there much chance to work the board, or is your job responsibility mostly peripheral?

"As Ron mentions in his interview, he can never really relinquish control of the board; that's in his blood. But numerous times, Ron will leave everything to me."

On a session with two engineers — yourself and Ron — isn't the possibility of conflict of personalities or opinions a real threat?

"I don't think there's any real conflict. I'm a capable engineer, and want to do my own engineering and production projects, but at present I know I'm working with Ron. I'm not there to upstage him, and he wouldn't appreciate that anyway. As long as the roles are defined, there's no conflict.

"Ron respects what I have to say regarding mike selection, for example, but he has particular microphones that he prefers. I enjoy putting up additional mikes along with his standard choices. I know he likes a Shure SM-57 and a Neumann U87 on guitar. If I think something else might sound good, I'll put that mike up, too. He appreciates the chance to hear something else without wasting a lot of time.

"Some microphones are pretty standard, though. Working with Andy Johns and John Strohnack, I've found that they, also, usually prefer the 57 for brightness, and the 87 for the 'roundness'. Those choices are typical, especially for rhythm tracks. When it comes time for the overdubs, that's where the more creative choices tend to enter in."

Do you ever recommend techniques to Ron that you've seen other producers use?

"Never! I keep that out of the way. Ron's an excellent producer. As far as production goes, I never step in. He has his job, and I have mine." □□□

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bass are in the middle. The high-hat I may pan over to the right a little bit. Toms are spread evenly, depending on how many there are. If there are four, then I'll put the floor tom all the way on the left, the rack tom all the way on the right, and the other pair in the middle. This provides some kind of feeling that the sound is going across you while Aynsley's doing a fill. The overheads are full left and right; the drum kit is really opened up.

I usually don't pan anything too much. The guitars are usually left and right. The only thing is, if you put what I do into mono, the center information is 3 dB louder, but the mix doesn't change much.

R-e/p: Do you change your mix if you know that it's going to be played on a mono or smaller system?
RN: Yes, if I think it might be a single. If it's definitely an album track, I won't consider it. I'll just spread it out, as I've explained. But I'll still check it in mono, just to make sure that it's compatible. For a single, I'll squeeze the mix a little bit tighter.

R-e/p: When you sit down to start a mix, what's the first thing you do?
RN: Get everybody out of the studio. I mix on my own, but under supervision. Generally, if the session is with a band, they realize I can't do any of that computer mixing. My approach is basically concentration, and it's very hard to include anybody in that. I have to get myself into a situation where I can make all the moves I want almost by second nature. Until I get to that point, I can't concentrate on the mix and, with a lot of distractions, it's very difficult.

I've come to understand that if the group is at the studio — and it's important for the band to be around — when I get to a point where I think I've got a mix that I like, they come in, listen to it, and tell me what they think. Then we go on from there. It's my feeling that, in the end, you have to please the group; *they* have the final say. I don't care who the producer is.

R-e/p: But there's a point where, if you keep giving in or compromising, you become ineffective as a producer.
RN: That's right, but maybe you misunderstood me. My job is to present a group the way that I think they should be presented, which, I hope, is the way they think they *should* be presented. Hopefully, we're very close in that regard.

I might have disagreements with different members of the band, who may think they're not being showcased enough. But the real truth is, you can't have everybody in the mix at the same time, and have a good record. The better parts have to be brought out, and the lesser ones have to be set back. If the band members are listening only to their own performances, they're not being objective about the overall mix. And that's why they hired me as producer.

The drummer, for example, may be there listening only to the drums. Well, ok; the drums are important. But everything is important! The big question is: what's *more* important? There's got to be something; you can't have everything at the same level in the mix.

R-e/p: So, when a group hires a producer, they're really hiring objectivity?
RN: That's right. And a psychiatrist. I once read a funny quip by Ian Hunter, who was being asked about his Mott the Hoople days. The interviewer was asking, "Well, what about Guy Stevens? [the original Mott the Hoople producer]." Ian's answer was, "Guy Stevens really wasn't a producer. He just drove everybody up the wall, which is the same thing as a producer." [Laughter]

R-e/p: You became involved with producing through engineering. How technical an engineer are you? Do you really care what's going on inside the console, or do you view it as just another creative tool?
RN: I'm not too concerned at all with what's going on inside the board. I approach it practically, as though it were a creative tool. I don't understand a whole lot of it. My knowledge just comes from using the equipment. Sometimes things work, and you don't really know why they work, but there's usually not time enough to stop and figure it out.

R-e/p: Do you think that's an advantage for a producer?
RN: It's always an advantage. There are things I would have done years ago that I wouldn't do now. It applies to engineering and producing. Whatever comes from experience limits you: you're not as open to trying things, because you're too quick to say that it won't work. I have to say that I really don't miss the technical end. I'm quite happy the way everything has worked out.

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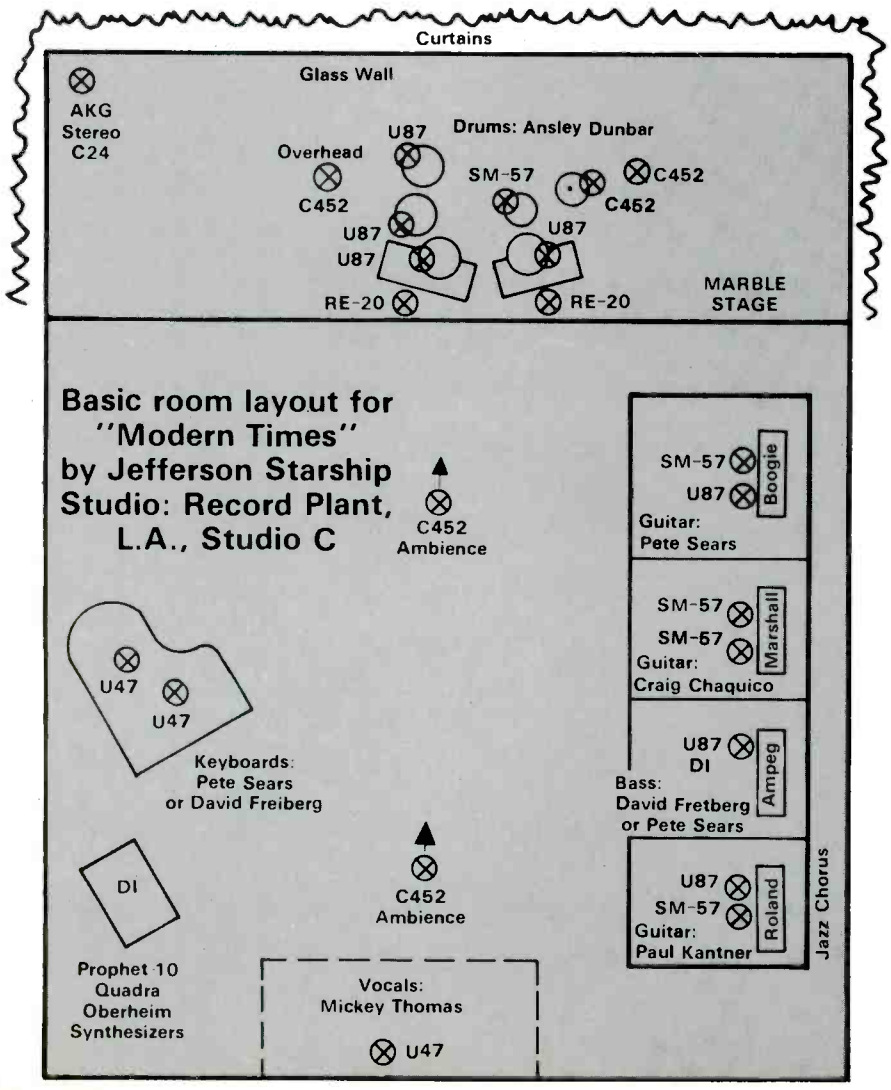

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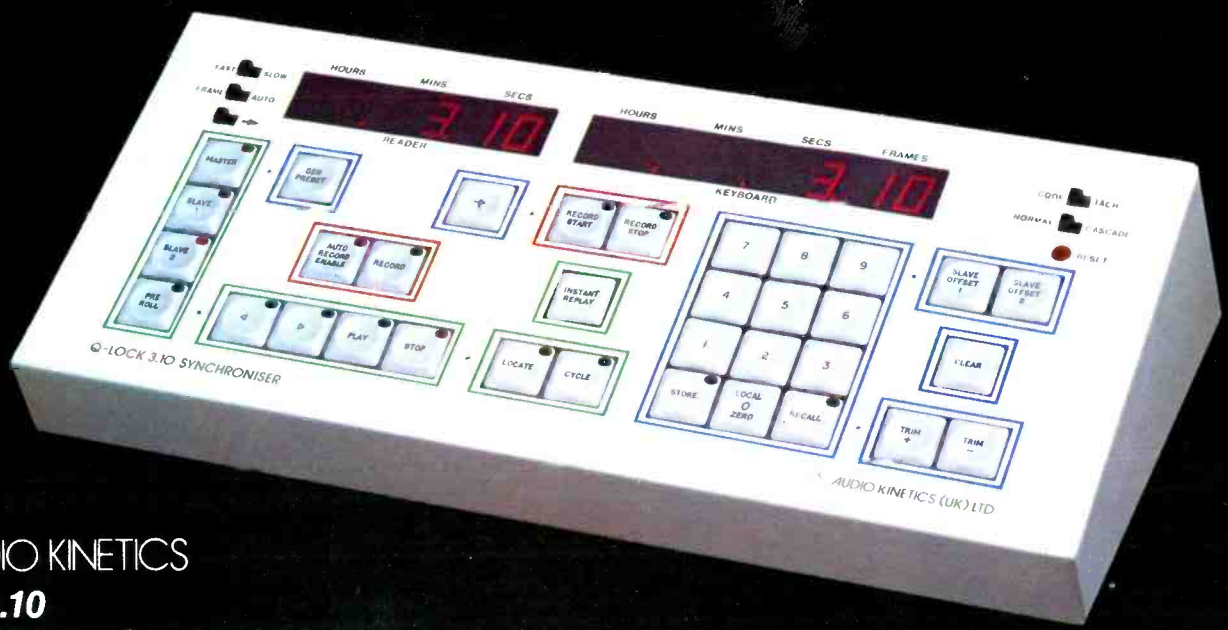

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R-e/p: Do you tend to ever downplay the technical aspects of studio work when you're working with artists?
RN: A lot of artists know more than I do, theoretically. Unless somebody asks me a direct question, the roles are pretty well-defined. They do their job and I do mine. If they want to convey a specific sound or concept, and they know more about it than me, they may try to convey it in technical terms to make their point.

R-e/p: I've heard that you have a reputation for being a tough producer, of speaking your mind, and maybe being tactless at times.
RN: Just because you hurt somebody's feelings, doesn't mean you're tactless; it could mean that you're *honest*. It could mean: "Let's stop wasting time, and realize that this is a situation where beating around the bush is just going to waste money. I'm sorry that you don't think I'm a nice guy, but that's the way it goes."

That kind of attitude comes with the responsibility. If you're responsible for something, then you have to be prepared to take the knocks that come with that responsibility. If the people aren't prepared to work hard . . . I mean, some people want it every way, don't they? They want the money; they want it easy; and they want a great album. When do you start working? Where does *that* come in?

R-e/p: Unfortunately, a lot of people get into the music scene because they have the misconception that it's one big party.
RN: I love the fact that somebody can find a career they like, and still earn some money. But there's a lot of competition out there. That's the difference. There's a lot of people that are more talented, and they don't have to work as hard as other people. But the talent dries up when they become complacent, and start thinking that just because they're successful, or making records, everything they do is brilliant. That's not always true.

R-e/p: Can I assume what you're saying is that you really need some pressure to keep productive?
RN: I don't know. There's creative, and there's *CREATIVE*. Sometimes, in order to be prolific as a songwriter, you need tragedies in your life — something to make you melancholic or sad. That doesn't mean I go around hoping that the artists I work with are going to break up with their old ladies all the time so they can write good songs. It depends. That kind of creativity isn't healthy.

R-e/p: For the new Starship album, were all the basic tracks laid down at the same time?
RN: They were all cut together — sometimes three guitars and bass, or two guitars, bass and keyboards. All the instrument amps had houses around them: front, back, sides and top; all closed in.

R-e/p: From the sketch you've supplied I see that you used either a Neumann or a Shure to pick up the amp sound.
RN: For guitar, I primarily use SM-57s; the U87s weren't used that much. On *Modern Times*, I had both set up, but I usually went with the 57. Very rarely did I use the 87, and occasionally I went with a mixture of both.

R-e/p: Have you had any problem with the Neumann breaking up from the guitar amp's high SPL?
RN: I haven't had any problem with the loudness, because I always use the 10 dB pad.

R-e/p: You don't usually see many Neumanns used on bass.
RN: I normally use just the 87, take the bass direct, and then put them both on separate tracks. I take those right to the final mix that way, and put the direct 180 degrees out of phase with the miked track. Neumanns aren't used that much on bass, but I like the sound of the 87.

"On acoustic guitar . . . putting the microphone 6 to 8 feet away . . . no, you don't get the bottom end, but it's much more realistic . . . nobody listens with their head right next to the sound hole . . . why should they want to hear it that way on a recording?"

They don't have as much middle as a dynamic mike does; they're a much more even, overall response.

R-e/p: How did you position the microphones for the grand?
RN: I choose to mike acoustic piano with two Neumann U47s facing down toward the strings, and the distance from the harp, of course, changed according to whether or not the lid was open or closed. We kept it closed for basic tracks, when everyone was playing in the room, and then opened it up for overdubs. The mikes were about 15 inches apart, and between seven and eight inches above the strings with the top open.

We used three synthesizers — the Quadra, a Sequential Circuits Prophet, and an Oberheim — and those were always recorded direct.

R-e/p: Do you ever overdub an instrument in the control room?
RN: Just synthesizer. There are so many sounds you can get from that instrument, that the only way you can really tell what you're getting is to run it through the studio monitors. Plus, communicating with the musician when he's in the control room is much easier, and it's more comfortable for him. Sometimes I'll do that with the guitarist, too.

R-e/p: Were vocals for the Starship album double-tracked?
RN: Sometimes triple-tracked. Sometimes I'd put each of the three vocals on separate tracks, and then record them twice more, combining them on the left and right. So I'd have two combined tracks of the three voices — five tracks altogether — and three performances. I'll use just a little bit of echo and that's it. At the end of "Find Your Way Back," the "Back, back, back, back" part I caught with the repeat button of an Eventide digital delay.

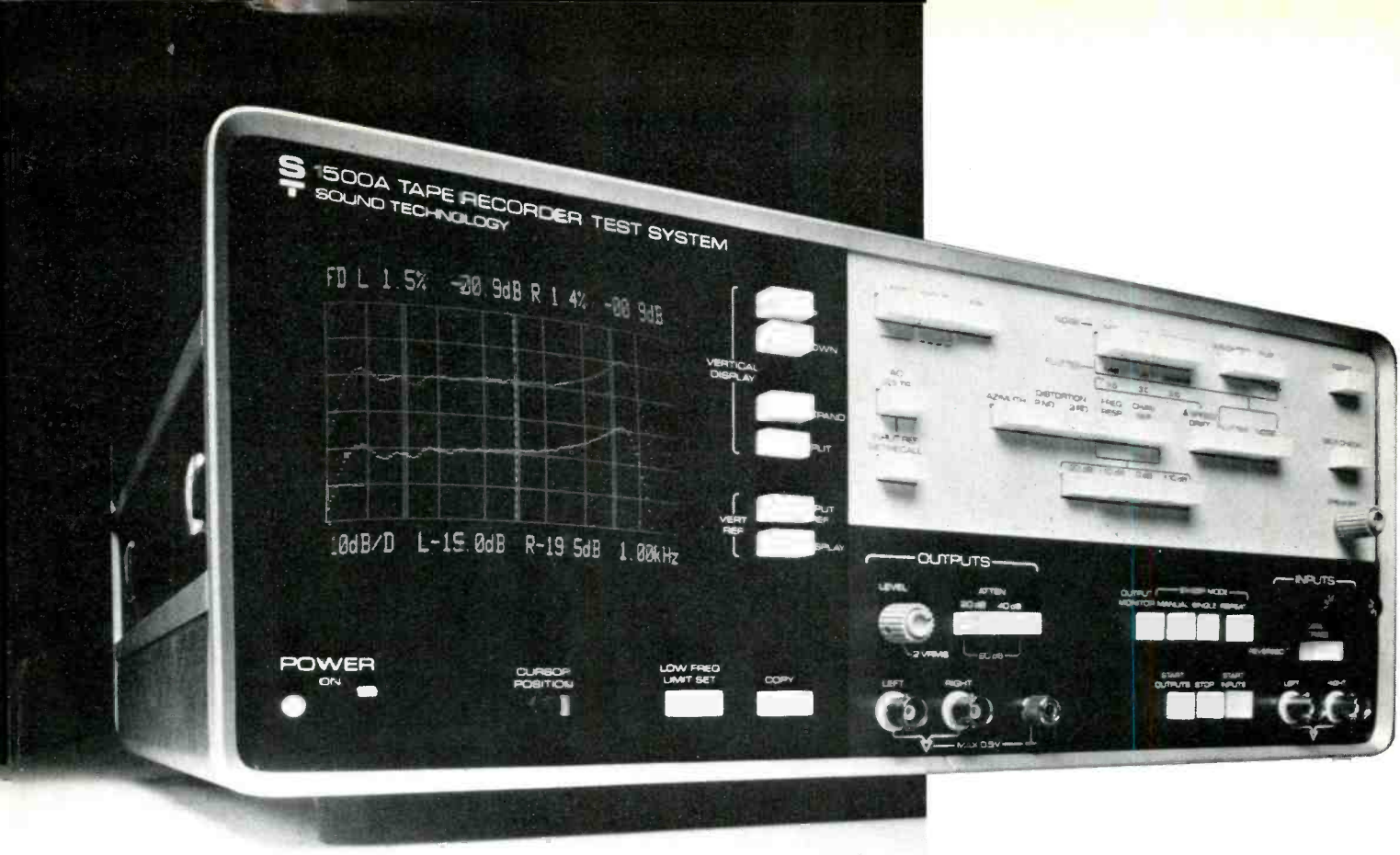
R-e/p: Do you spread the voices out at all to make them a little bit "fatter?"
RN: Yeah. I'll put the three voices center, left-center and right-center, and then put the pair full left and right to provide a very big sound.

R-e/p: What kind of mikes do you use for acoustic guitar?
RN: Usually an AKG C452, or a Neumann KM84. I like them both, because they're clear. You can put them far away — about six to eight feet — and they stay accurate.

R-e/p: Do you still get the bottom end from the instrument, or are you trying to eliminate that?
RN: No, you don't get the bottom, but it's much more realistic. Nobody ever listens to the guitar with their head right next to the soundhole. So why should anyone hear the guitar that way on a recording?

You have to be realistic about the approach to the instrument in order to hear it properly. That's why I have the stereo drum mike in the corner; it picks up the whole kit at a proper distance. I put the stereo mike up left and right first, and then balance everything around it with the close mikes one at a time. There are a lot of problems, and somebody could drive themselves crazy trying to duplicate the miking diagram. There were a lot of phase problems that we had to sort out during the recording of *Modern Times*.

R-e/p: Those phase anomolies were all pretty much at random too, I would assume?
RN: Right. Things work, and you don't know why, but you go with it. You could put one tom out-of-phase, and everything could work perfectly. It's just a question of working through the situation, detecting the problems, and constantly checking. With so many microphones in use, there's a tendency to neutralize everything. You have to



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"I always have trouble with record companies . . . It's always an artistic conflict . . . The companies that have hired people to liaison between people like myself and the accountants are the most successful . . ."

keep checking to make sure that everything you're getting on tape is accurate; that what's recorded is not going to disappear here and there during playback.

R-e/p: On Starship's Modern Times *album, how did you record the guitar for the "Find Your Way Back" solo?*
RN: It was a Marshall amp turned up to about 10, with the signal put through a Roland stereo flanger, or one of those effects. I can't remember whether or not I recorded the flange right on the tape; I think I did. I usually record tracks with the effects, except for echo. For instance: I did the track "Kashmir" on Zeppelin's *Physical Graffiti* with phasing on drums. That was the first day I got an Eventide Phaser, back in 1973. I just took one of the two mikes I was using on the drums, and put it through the effect to a separate track. I did the settings while I was cutting the tracks. All the fills at the end just happened to phase correctly for the track; it was just one of those things.

R-e/p: Returning to the Starship album . . . the drums are very distant on "Stranger," too. Is that all room sound?
RN: Right, although I did use a Lexicon Model 224 DDL with a very short delay — about 0.7 milliseconds. It's really impossible to calculate, because it's not so much a delay as it is a reverb.

R-e/p: You're really just fattening up the sound, rather than giving it any depth?
RN: Yes. But I did try an interesting delay on the guitar and vocals. I used a 4-track 3M digital recorder, because of its digital clarity. The preview head that the machine has for mastering contains a sophisticated delay line. I ran the guitar and vocals through that for a 2-second delay. Under normal circumstances, even using some of the good delay units, the quality wouldn't have been good enough with so much delay.

R-e/p: Have you been doing a lot of digital recording?
RN: Yes, but not recently — only when people can afford it. I prefer to use whatever I can use — analog or digital. To be limited is a drag. I've never totally gone digital, but I've used it for a couple of albums as sort of an interim tool. For that I'd lay the basics down in analog, transfer to digital, do all the overdubs, and mix it back to analog. That way I have the benefit of the sound I was used to on the basic tracks, without all the tape loss and other degeneration that occurs with overdubbing.

Tracks with a lot of transients, like the drums, would already be recorded and compressed. That way I can use the digital to bounce down vocals, move parts around, transfer, and do almost anything I want without generation loss. By going back to analog, I can take the master tape to some antiquated studio for mastering. That's the way I've found digital to be helpful. It's just a matter of expense now.

R-e/p: You have your own production company called Gadget Productions. Do you look for new talent, do pre-production, recording, mixing, and then sell the finished product to a record company?
RN: Generally, the group's manager or the record company A&R man calls me up. I generally get called into situations where the group has done a couple of albums, and they haven't been particularly successful. They look to me to rescue them, sort of. I do a lot of rescue work. I think that people come to me because I'm more persistent than a lot of producers. I may spend more money, but . . . persistence is money. I spend more time.

I get cast in those kinds of situations partly because I don't like to do new groups. First of all, record companies want you to do a project for less money, and the groups need more time, because they have less experience. The situation works against you. When a new group goes into the studio, the first thing they want to do is everything they've ever learned. It takes a while for the group to adjust to working in a recording environment.

I'd much rather work with somebody who's done a few albums. I don't really care that much whether they have or have not been successful. What I do care about is that they've gained enough experience so they'll understand me better. I can work faster like that.

R-e/p: That brings to mind a particular point. Rock groups, for example, all seem to have the same common denominator of trying to communicate a sense of power; that's the essence of the music. Now, in some cases, the groups sound like they're straining to create that power, while other groups, like Starship, can create that power effortlessly. Is that effortless power a result of the group's maturity?
RN: Could be. I think the older you get, the more the disappointments tend to roll off your back. It might color your opinion of things, but you become more resilient. You're less resistant to change, because you've learned that it's healthy. Young rock and rollers don't know that yet. Maturity is not something you can instill in them. If we put ourselves back to when we were in their position, we didn't have it either.

R-e/p: You don't feel there's anything you can do from a production or engineering aspect, to achieve that effortlessness feeling during a session?
RN: Well, if you give me three or four years!

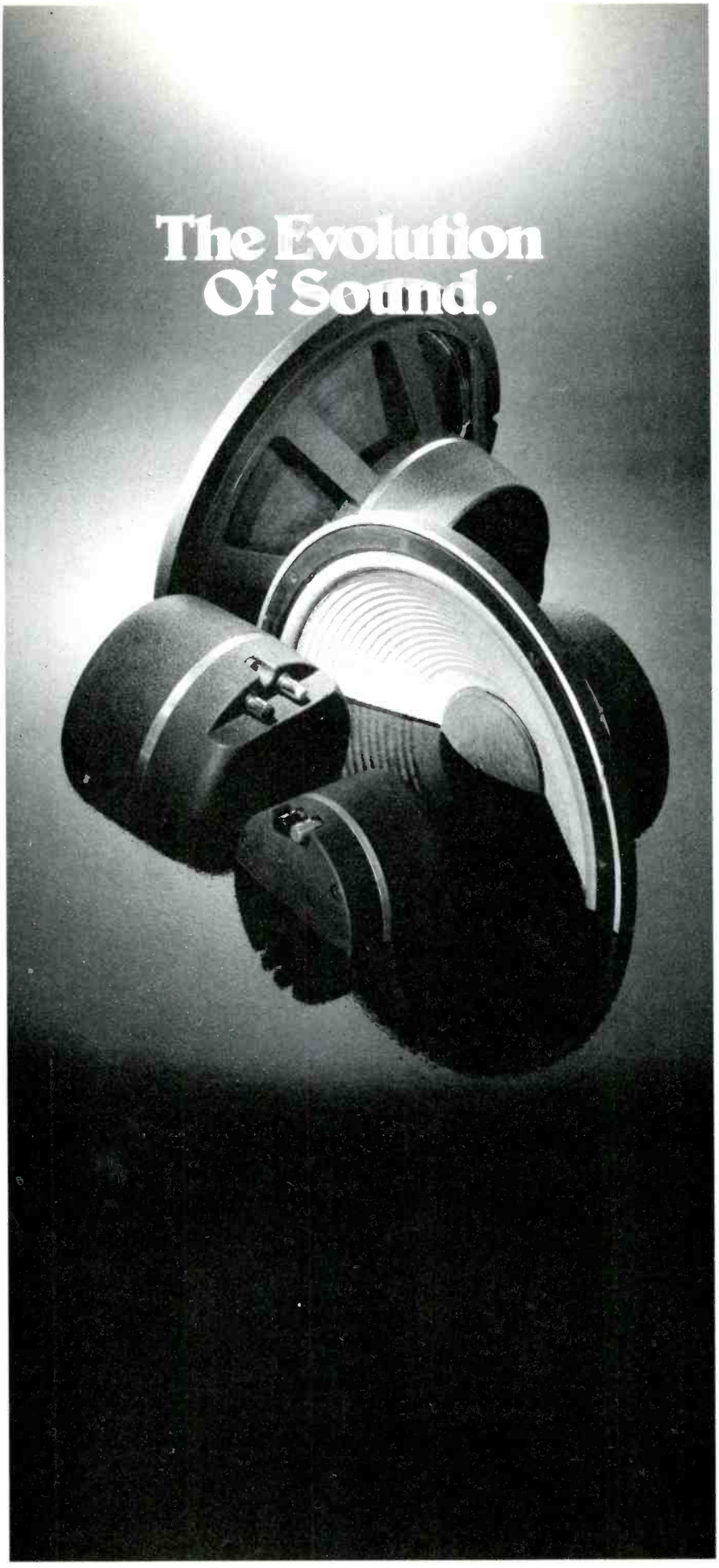
R-e/p: With your track record, do you still have trouble with record companies financing groups or projects?
RN: I *always* have trouble with record companies. Generally speaking, a producer is working for a bunch of accountants who are trying to make money in the music industry. They're usually too boring to be of interest, and it creates a problem. It's always an artistic conflict. The company doesn't understand what the creative people are trying to gain, and that's the *big* problem. The record companies that have hired people to liaison between people like myself and accountants, are the most successful companies, I think. They have the key to mediating between those two divergent worlds.

R-e/p: Many people feel that the majority of record company executives now are either lawyers or accountants, and that there aren't many music people left in the record companies.
RN: Well, I don't know about that. Maybe that's a bit of a heavy statement. It depends on who you are talking about.

As times get bad, people get more desparate, and they start looking around. I think the one major mistake that people in the entertainment industry make is to not qualify someone before they hire them, and then get behind their choice. The general trend seems to be to hire a producer or whoever, and then try to second guess him before anybody understands what he's doing.

I'd really much rather see people taking more time in deciding who to use, and then take the attitude of, "OK, we've decided who to use, now let him do it. We might not understand how he's doing it, but he has a history of doing it so that it comes out right in the end."

There's a lot of meddlers out there that hire you, and then try to see what you're doing. It's like coming in on Chapter 18 of a novel, and trying to understand what's going on. You just can't! It's not fair for the record companies to exert themselves at that point, yet they do; they feel that's their job. It's *not* their job. Their job is to make sure beforehand that you can do it, and then let you get on with it. But try and tell them that?! □□□



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For additional information circle # 28

Editorial Note: The readers' attention is drawn to the fact that this article describes a "prototype" record producer's agreement. It is recommended that a record producer engaged to produce a recording should seek the advice of counsel before embarking upon the project.

Successfully Negotiating The Record Producer's Agreement

PART TWO — COMPENSATION OF SERVICES

©by Daniel Webb Lang and Neville L. Johnson 1982

The first installment of this article, published in the October, 1981, issue of *R-e/p*, concerned itself with the terms of a record producer's agreement with, and the services required by, record companies, artists and others. Also contained within the first installment was a sidebar comprising a "prototype" record producer's agreement. Since this second installment, and the last part to follow in a subsequent issue, make several references to the Prototype Record Producer Contract, it is recommended that the reader refer to that agreement whenever it is mentioned.

PAYMENTS TO RECORD PRODUCERS

A. Methods of Payment

A record producer may be compensated in several ways:

1. Flat fee payments

The flat fee payment is a lump sum that is payable either "per session," "per side" or "per project," and usually includes union scale or multiple scale payments to a record producer for services rendered by him as a musician or vocalist; if the recordings are subject to union jurisdiction. The average flat fee payment paid by a major record company, such as Capitol, is $500 per side.

2. Royalty payments

(a) Computation

"Royalties," or as they are more commonly referred to, "points," are a percentage of the wholesale, retail or artificial price of a record, measured in dollars and cents, and computed on all or part of the number of records distributed. Think of a royalty on a record as a certain number of cents payable to a record producer for the sale of a record. As a rule of thumb, a royalty point, i.e. 1%, based on the suggested retail price of an $8.98 record, is about 8¢, and about 3.8¢ based on the wholesale price of a record with a suggested retail list price of $8.98.

The current range of a record producer's royalty rate is between 3% and 4% for someone whose royalties are being computed upon a suggested retail list price (and between 6% and 8% if the record producer is paid a royalty based on the wholesale price). Three percent of the suggested retail list price (or 6% of the wholesale price) is the most common royalty rate. Of course, there are record producers who may be paid 2% of the suggested retail list price (or 4% of the wholesale price), and there are "super producers" who may be paid 5% of the suggested retail list price (or 10% of the wholesale price).

The wholesale price and suggested retail list price of a record are not directly related. Thus, doubling the royalty rate based on a retail list price and basing it on a wholesale price, or vice versa, will not necessarily yield the "same pennies," but will probably come close.

(b) Advances against royalties

An "advance" is a payment to be deducted from future record royalties that may be earned by a record producer. Occasionally, an advance is "non-recoupable," i.e. not deductible from record royalties that may be paid to a record producer, and is, in effect, a fee.

Today, a typical advance for an LP will range from $15,000 to $25,000. The bottom line at a major record company is about $10,000; super producers may be paid as much as $75,000.

A record producer's advance is usually paid in two equal segments: the first half payable upon the commencement of the recording sessions; and the remaining half following delivery of the tapes to a record company. It is in a record producer's interest to obtain the maximum amount of his fee or advance prior to delivery of the tapes. Otherwise, a record company may set off all or part of any excess recording costs against the remainder of his fee or advance, claiming that the record producer is responsible for some or all of those costs. Moreover, an artist may not have enough monies left in the recording budget after completing his record to pay the balance due a record producer for his services.

(c) Bonus payments based on "underage"

In addition to a regular advance, a record producer may be promised that if

— the authors —
Daniel Webb Lang practices with the Century City (Los Angeles) law firm of Wyman, Bautzer, Rothman, Kuchel & Silbert. **Neville L. Johnson** practices law in Los Angeles, California. They are co-authors of a definitive work on California law applicable to talent agents, personal managers, and the entertainment unions.

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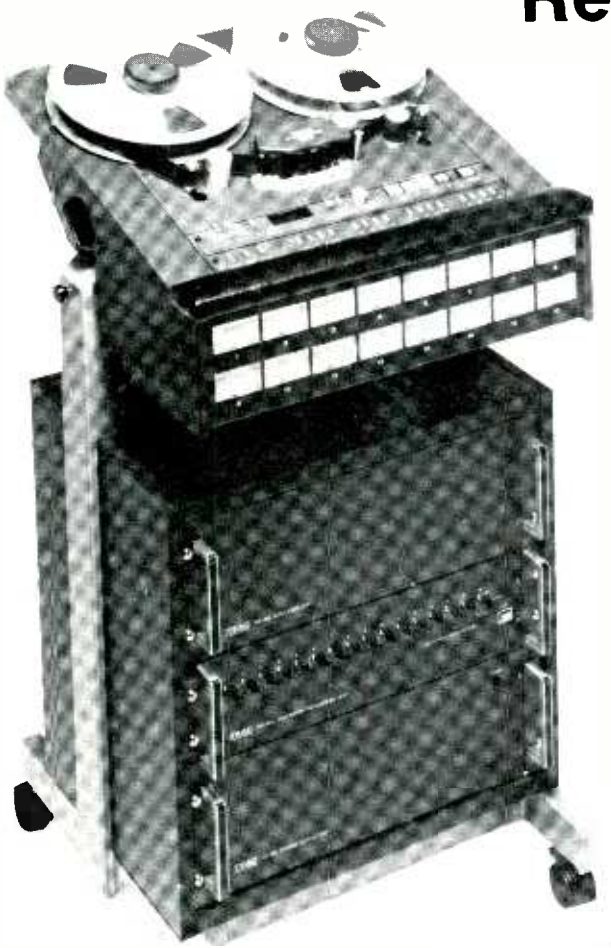

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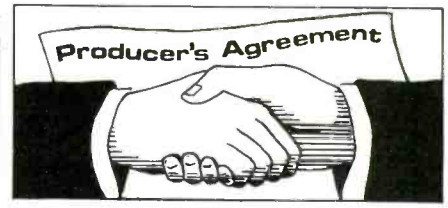


the record is brought in under budget, he will receive a "bonus payment" equal to or part of the "underage" — the difference between the established recording budget and actual recording costs.

(d) Who pays royalties?

A record producer may be paid by record company, independent production company, artist, or distributed label. Anyone paying record royalties other than a record distribution company (such as Warner Brothers) is merely a conduit through which pass record royalties collected by the record distribution company. A record producer paid by an artist, for example, is receiving a share of the royalties the artist received from a record distribution company. Payment by anyone other other than a record distribution company may increase the risk of fraud, and will almost always delay the payment of royalties. Thus, it is preferable for a record producer to be paid direct by a record distribution company, rather than by an independent production company, artist, or a distributed label.

(e) How royalties are computed

(i)"Basic royalty rate" and "reduced royalty" records

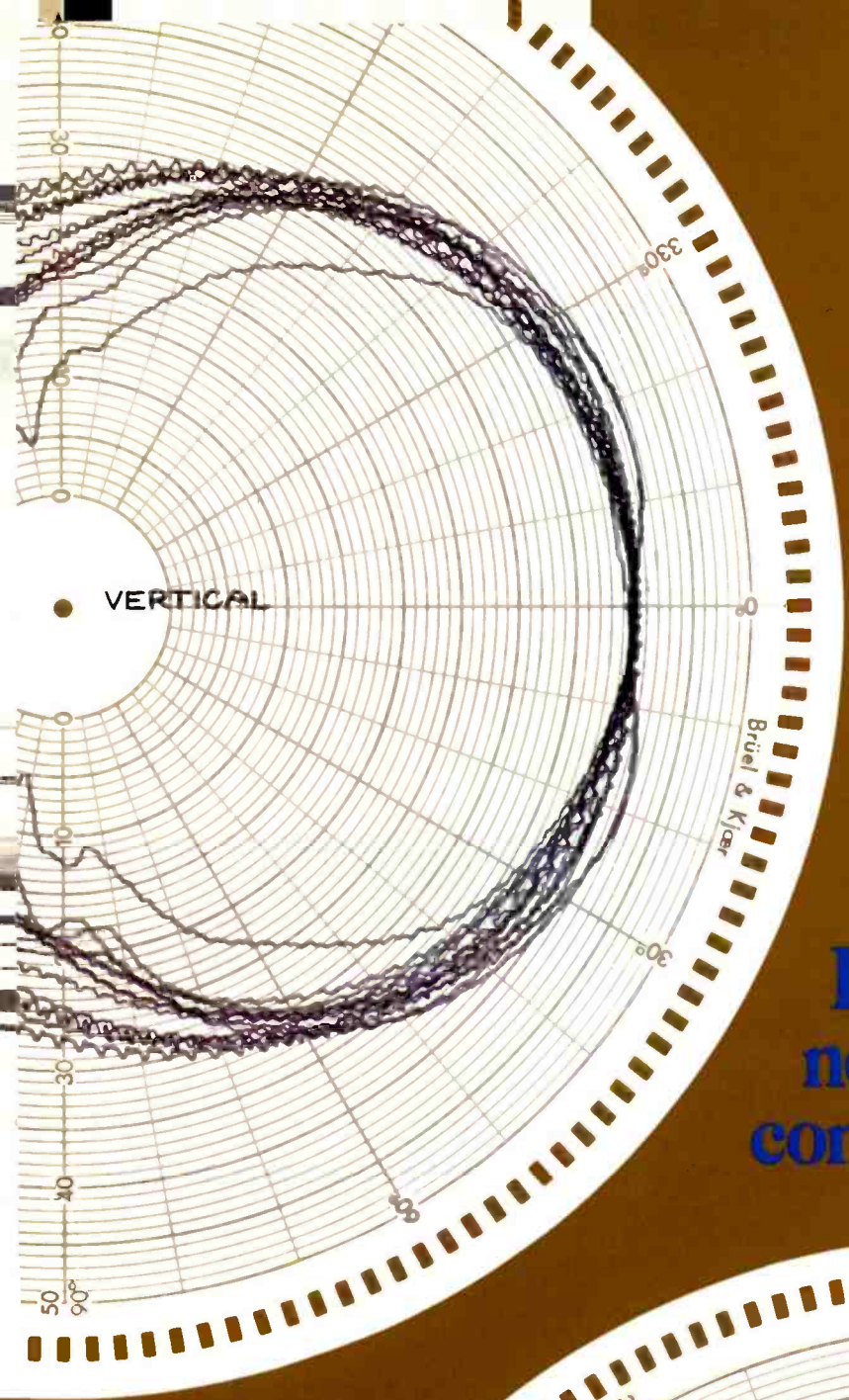
The royalty rates referred to in Section 2 (a) above are the "basic" royalty rates for top-line records distributed through "normal retail channels," i.e., record stores and other retail record outlets in the United States. Records sold in foreign countries, records sold through record clubs, to the armed forces, budget records, re-issued records, premium and other types of non top-line records are "reduced royalty" records. Royalties for reduced royalty records are usually computed on actual prices, and at royalty rates that are a fraction of the "basic" royalty rate. Paragraph 6C of the Prototype Agreement (see October, 1981, issue) illustrates typical royalty reductions for reduced royalty records.

Royalties are always reduced by a so-called "packaging deduction" — an artificial and anomalous practice — which is "non-negotiable." Royalties are usually also reduced by any so-called "free goods" — records given to wholesalers for which no royalties are payable.

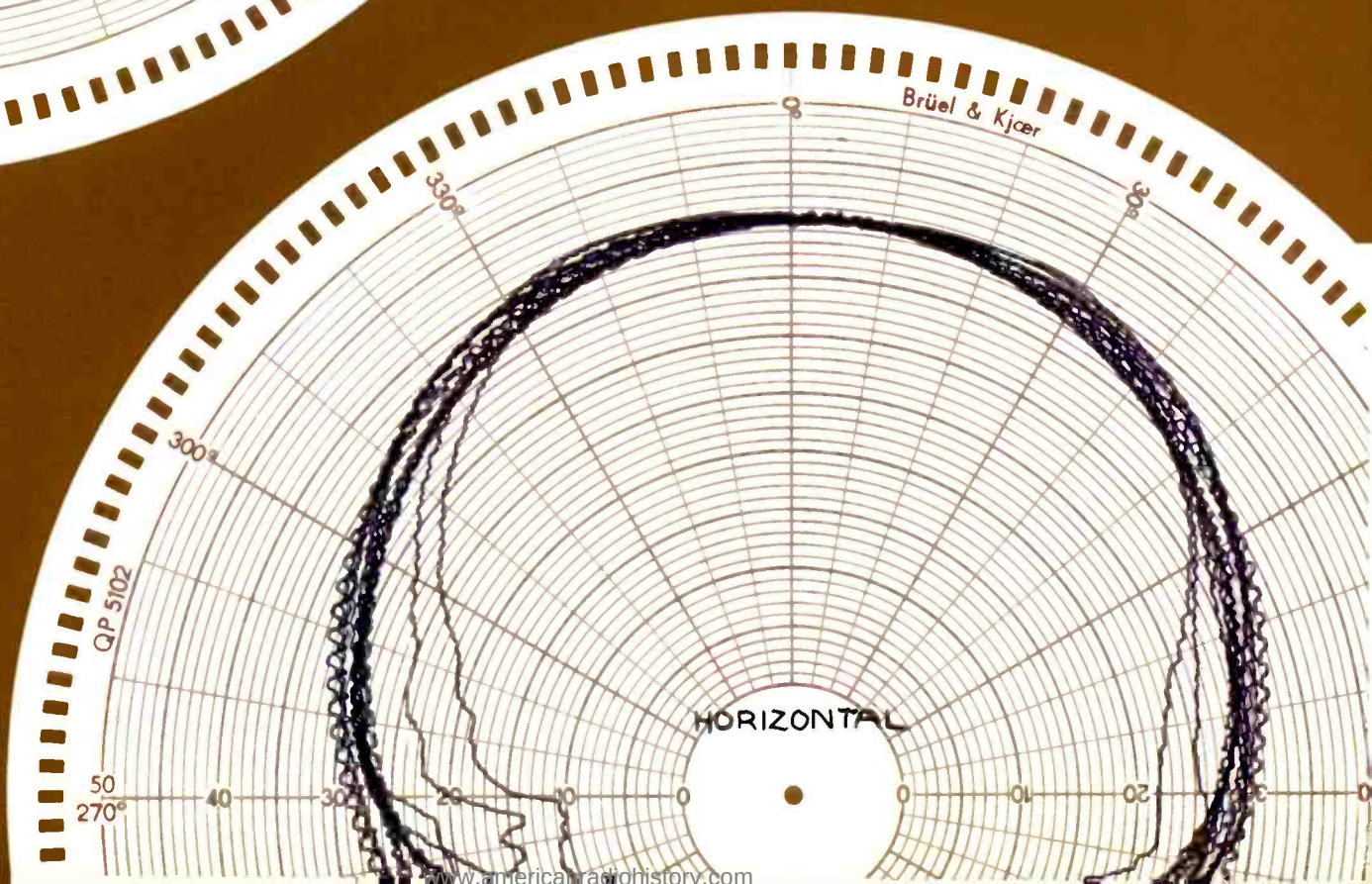
(ii) Standard Form record producer contract subject to negotiation or same treatment as artist

A record producer may negotiate the royalty provisions of a form record producer agreement similar to the Prototype Agreement, or request that he be treated in the same manner that the

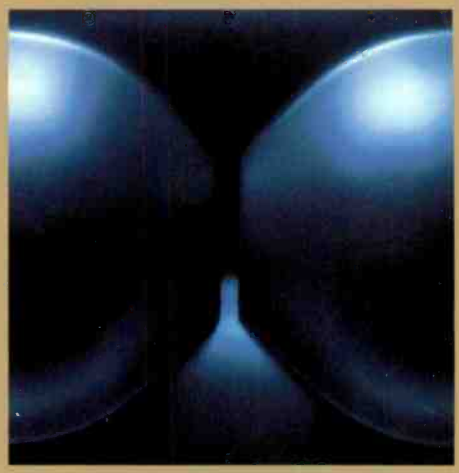
. . . *continued on page 55* —



Before you invest in new studio monitors, consider all the angles.



Introducing the JBL Bi-Radial Studio Monitors.



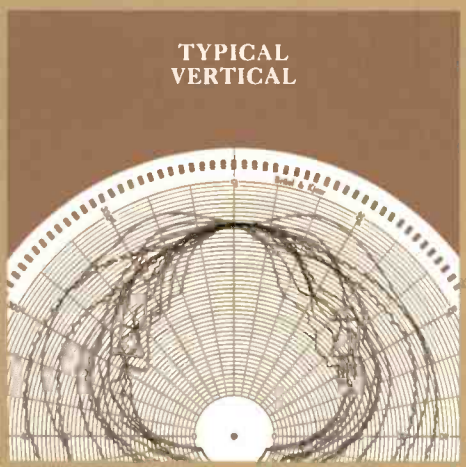
No one has to tell you how important flat frequency response is in a studio monitor. But if you judge a monitor's performance by its on-axis response curve, you're only getting part of the story.

Most conventional monitors tend to narrow their dispersion as frequency increases. So while their on-axis response may be flat, their off-axis response can roll off dramatically, literally locking you into the on-axis "sweet spot." Even worse, drastic changes in the horn's directivity contribute significantly to horn colorations.

At JBL, we've been investigating the relationship between on and off axis frequency response for several years. The result is a new generation of studio monitors that provide flat response over an exceptionally wide range of horizontal and vertical angles. The sweet spot and its traditional restrictions are essentially eliminated.

Polar response of a typical two-way coaxial studio monitor:

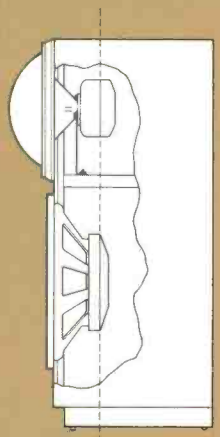
Polar response of a 4430 studio monitor:



The Bi-Radial Horn

The key to this improved performance lies in the unique geometry of the monitors' Bi-Radial horn! Developed with the aid of the latest computer design and analysis techniques, the horn provides constant coverage from its crossover point of 1000 Hz to beyond 16 kHz. The Bi-Radial compound flare configuration maintains precise control of the horn's wide 100° x 100° coverage angle. Since this angle is identical to the coverage angle of the low frequency driver at crossover, the transition from driver to driver appears seamless and the monitors present a fully coherent sound source.

And the Bi-Radial horn's performance advantages aren't limited to just beamwidth control. The horn's rapid flare rate, for instance, dramatically reduces second harmonic distortion and its shallow depth allows for optimal acoustic alignment of the drivers. This alignment lets the monitors fall well below the Blauert and Laws criteria for minimum audible time delay discrepancies.



Acoustic alignment of drivers (4430)

The practical benefits of the Bi-Radial horn design include flat frequency response and remarkably stable stereo imaging that remain valid over a wide range of listening positions. The design also allows considerable latitude in control room mounting. Finally, the flat on and off axis frequency response of the horn means that less high frequency equalization will be required to match typical house curves.

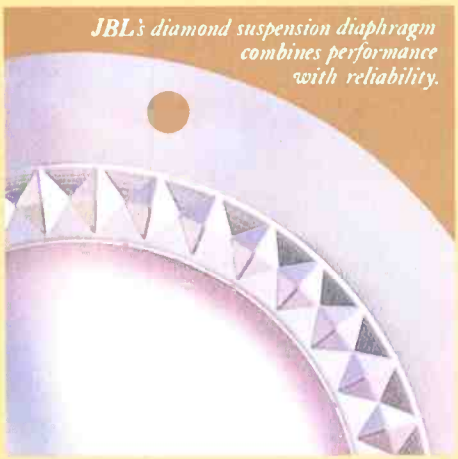
But while the Bi-Radial horn offers outstanding performance, it's only part of the new monitors' total package.

Extended Response in a Two-Way Design

Coupled to the horn is a new compression driver that combines high reliability and power capacity with extended bandwidth and smooth, peak-free response. The driver features an aluminum diaphragm with a unique three-dimensional, diamond-pattern surround.[1] Both stronger and more flexible than conventional designs, this surround provides outstanding high frequency response, uniform diaphragm control, and maximum unit-to-unit performance consistency.

To ensure smooth response to the lowest octaves, controlled midband sensitivity, extremely low distortion, and tight transient response, the Bi-Radial monitors also incorporate the latest in low frequency technology. The loudspeakers' magnetic structures feature JBL's unique Symmetrical Field Geometry (SFG) design to reduce second harmonic distortion to inconsequential levels. Additionally, the speakers utilize exceptionally long voice coils and carefully engineered suspension elements for maximum excursion linearity, and complete freedom from dynamic instabilities for tight, controlled transient response.

Symmetrical magnetic field of JBL SFG design greatly reduces distortion.



JBL's diamond suspension diaphragm combines performance with reliability.

Blending the Elements—The Dividing Network Challenge

Tailored to the acoustical characteristics of the Bi-Radial monitors' high and low frequency drivers, the dividing network provides the smoothest possible response over the widest bandwidth while restricting any anomalies to an extremely narrow band. During the network's development, JBL engineers paid considerable attention to on-axis, off-axis, and total power response. As a result, the electrical characteristics of the network are optimized for flat response over the monitors' full coverage angle.

The network also provides equalization of the compression driver for flat power response output. This equalization is in two stages with separate adjustments for midrange and high frequencies.

Judge For Yourself

Of course, the only way to really judge a studio monitor is to listen for yourself. So before you invest in new monitors, ask your local JBL professional products dealer for a Bi-Radial monitor demonstration. And consider all the angles.

1. Patent applied for.

4435

4430

Specifications	4430	4435
Frequency response (± 3 dB)	35 - 16,000 Hz	30 - 16,000 Hz
Power Capacity (Continuous Program)	300 W	375 W
Sensitivity (1 W, 1 m)	93 dB	96 dB
Nominal Impedance	8 Ohms	8 Ohms
Dispersion Angle (− 6 dB)	100° x 100°	100° x 100°
Crossover Frequency	1 kHz	1 kHz
Network Controls	Mid Frequency Level High Frequency Level Switchable Bi-Amplification	

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— *continued from page 50 . . .*

artist being produced is treated. The approach selected will depend on the bargaining positions of the parties, and the knowledge a record producer's attorney has about the artist's royalty rates.

If an established record producer is producing a new artist, it may be preferable to negotiate the form agreement. If a beginning record producer is producing an established artist, it may be preferable to bargain for the same treatment as the artist.

In most cases, a record producer's royalties are reduced and computed in the same manner as those of the person or entity (usually an artist or independent production company) pacting with the record company.

(iii) Payment from record number 1

A record producer is usually paid royalties "from record #1." This means that his royalty account is credited with a royalty for each record sold. An artist generally is paid only for records sold after recording costs have been recovered from his royalties.

A record producer is usually paid "from record #1" in agreements between record producers and record distribution companies. When an independent production company is involved, a record distribution company pays all artist and record producer advances and royalties to that independent production company, which contracts directly with the record producer. An independent production company usually will not permit a record producer to be paid from the first record sold, because to do so would allow such record producer to share in record royalties before the independent production company.

(f) Royalty escalations

A royalty escalation is an increase in the original royalty rate payable for a record as a result of the success of that record or a prior record.

A royalty escalation may be applied to all sales of a record produced by a record producer, if the prior record produced by him has been successful. Usually, such an increase will be tied to the right of a record company to option the services of the record producer to produce another record of the same artist on the same terms as the prior record, except that the advance against royalties and the royalty for the record will be higher.

A royalty escalation may be applied to sales of a record after a certain number of records are sold. The escalation may be applied to all sales of the record, including those records sold before the required number of records was sold, i.e. "retroactively," or applied only to sales of the record occurring after the required number of records is sold, i.e. "prospectively." Usually, a record producer's royalty escalation is only prospective.

Typically, a royalty escalation will increase a record producer's royalty, based on a suggested retail list price, one-half of one percent after the first 250,000 records sold. There may be more than one royalty escalation applied to a record, although the increases will usually total no more than 1%. Thus, a record producer's royalty may escalate to 3½% from record 250,001 to record 500,000, and to 4% from record 500,001.

An escalation should be computed in a manner no less favorable to the record producer than his basic royalty rate is computed. If the basic royalty rate is paid to the record producer in the U.S. *and* Canada, the royalty escalation should be based on U.S and Canadian sales, as opposed to just U. S. sales. Similarly, if the royalty rate paid to the record producer is computed on disk *and* tape, then the royalty escalation should be based on sales of both, as opposed to disk only.

Often, the record sales required for a royalty escalation must be achieved by a certain date, such as the date of release of the next record of the artist produced by the record producer. All reported sales of a record up to the required date, and all "pipeline" sales, should be counted in determining whether or not a royalty escalation will apply. Domestic sales reports often lag behind actual record sales by as much as six months, and overseas sales by as much as one year. Such sales are in the "pipeline," but not yet officially

reported. Nevertheless, through the use of computers, record companies can and should determine these additional sales.

Royalty escalations usually apply only to the initial release of a record sold at a top-line price in normal retail channels. They do not apply to records on which reduced royalties are paid, such as Px or K-Tel records, or to records released subsequently to the initial release of a record, such as a "Greatest Hits" or a "Best-of" collection. These are negotiable points.

(g) Joint recordings

A record producer may produce recordings with one or more other record producers. He may actually work in the studio at the same time as another producer, or perform services before, during (but separately), or after another record producer performs services. A "joint production" would be the recording of basic tracks by two producers working in the studio at the same time. A production produced by "joint producers" would be the recording of complete tracks by one producer, and a remix or sweetening by another producer at a later time. Either a joint production or a production produced by joint producers may be described as a "co-production."

If a record producer is requested to jointly produce an artist with one or more other record producers, he must first decide whether or not he wants to produce an artist as part of a team. He must also agree with the other record producers how his and their services on the recordings will be rendered and credited. A record producer may find that he does not want to share creative control over a recording. Credit allocation can be a challenging task, particularly if the record producers are not, or believe they are not, making equal contributions.

Most record producer contracts provide that a record company has the right to terminate the services of a record producer, and substitute another record producer on a project. Most record producer contracts also provide that a record company may alter, vary, or change the tracks produced by a record producer. If any alteration, variation, or change is made, an artist or a record company may divide, i.e. "prorate," a record producer's royalty among the various record producers of the recording, generally in equal shares. If a record producer has enough bargaining power, he can require a record company to refrain from using the services of any other record producer to change or alter recordings produced by him (except if the recordings do not meet technical standards of satisfaction), or he can insist that any other record producers shall be engaged at that record company's sole expense, and without any reduction in his royalties.

If a record producer's royalty is prorated because other record producers are involved, then recording costs should be similarly prorated, or treated as a separate accounting unit to be applied to each respective record producer's royalties. Otherwise, the full amount of the recording costs for the project, including the costs incurred by other record producers, will be recouped before the record producer is paid royalties, which would significantly postpone or prevent the payment of record royalties to any such record producer.

If a team of record producers are producing a recording with another record producer, then, in prorating the other record producer's royalty, that team should be considered as one producer, and not separately as individual record producers.

(h) Coupled records

The recordings produced by a record producer may be coupled on a record with the recordings of one or more other record producers. Jointly produced records are prorated in a similar fashion to jointly produced recordings, with regard to credit, royalties and recording costs.

The "single" is a particular problem for a record producer who produces "coupled" records. If the "hit" or "A-side" of a single produced by a record producer is coupled with a "flip" or "B-side" produced by another record producer, the record producer with the A-side hit single will be paid only his one-half prorated share of the royalty he would have had he produced both sides of the single — even though the A-side is responsible for sales of the single.

A record producer can protect himself against a royalty proration on a jointly-produced single, by requesting an "A-side coupling restriction." If the request is granted, the A-side record producer will receive the full royalty rate that would have been payable to him had both the A- and B-sides of the single record been produced by him, even if the B-side is actually produced by someone else. If the record producer has the bargaining power to do so, he may require that all singles, or even the entire album, be comprised only of recordings produced by him.

3. Recoupment

(a) What is recoupment?

Recoupment is the point at which royalties become payable to a record producer.

(b) What is recoupable?

(i) Recording costs

Recording costs for the recordings produced by a record producer are recoupable. Consequently, the definition of "recording costs" in a record producer contract must be negotiated, because some items included by a record company in its definition of recording costs may significantly postpone or prevent the payment of royalties.

(ii) Advances

(a) Advances to artists

General advances to the artist, such as advances for the artist's personal use or for tour support, should not be recoupable as recording costs for the purposes of computing the point at which royalties become payable to a record producer.

(b) Advances to record producer

Advances paid to a record producer are generally recoupable from his royalty account. Many record producers are also engineers; an advance may include any compensation payable to the record producer/engineer for his services as an engineer. The portion of an advance that constitutes a record producer's engineering fee may be recouped as a recording cost, but should not be recouped as an advance.

(c) Recoupment of Recording Costs

Royalties are usually not credited to the record producer until recording costs are recouped by the artist produced by that record producer, i.e., until royalties credited to the artist's royalty account for sales of records equal the amount of all recording costs for the project.

(d) Recoupment of record producer advances

Once recording costs are recouped, royalties earned by a record producer are credited to him. If a record producer has received an advance against his royalties, the amount of such advance is deducted from such royalties. Thus, only royalties, if any, in excess of the amount of an advance against royalties are actually paid to a record producer.

(e) Rate of recoupment of recording costs

Recording costs may be recouped at the artist's royalty rate, i.e. the basic U.S. rate payable to the artist produced by a record producer; or at the "all-in royalty rate," i.e. the basic U.S. rate payable to an artist, independent production company, or a distributed label. In either case, however, the basic United States royalty rate payable to the record producer is deducted.

(1) Record company pays record producer.

If a record company hires a record producer to produce an artist, then recording costs are recouped by that record company at the artist's net royalty rate, i.e. the difference between the basic U.S. rate payable to the artist produced by a record producer, and the basic U.S. rate payable to a record producer. Following such recoupment, that record producer's advance is recouped from royalties credited to that record producer at that record producer's royalty rate. This can be illustrated as follows:

EXAMPLES OF HOW MONEY IS DISTRIBUTED

Assume that record company ("R") agrees to pay a record producer ("P") a 3% royalty and a $20,000 advance to produce artist ("A"), who has a royalty of 10% of the suggested retail list price. The budget is $100,000 including P's

Production Studio, WRBR-FM, South Bend, Indiana.

Electro-Voice's Greg Silsby talks about the Sentry® 100 studio monitor

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advance. The entire budget is spent, and there are no excess recording costs. A's album will retail for $8.98. There is a packaging charge (a charge for the cost of the record container) of 10% which is deductible from the suggested retail list price of the record. A's royalty rate, therefore, is $0.8082 ($8.98, the suggested retail list price, less $0.898, the 10% packaging charge, equals $8.082). P's royalty is $0.2424.

R will deduct P's royalty (3%) from A's royalty (10%) and recoup recording costs at the "artist's net royalty rate" *i.e.*, at 7% ($.5658).

R will allocate recording costs as follows:

$80,000 will be debited against A's royalty account;

$20,000 will be debited against P's royalty account.

It will take 141,392 records at the artist's net royalty rate of 7% ($0.5658) to recoup the $80,000 of recording costs debited against A's royalties. At the point 141,392 records are sold, R will credit P for $34,273.42, which constitutes P's royalties for the 141,392 records sold, and will debit P for $20,000, which constitutes P's advance. It will take 82,508 records at P's royalty rate of 3% ($0.2424) to recoup the $20,000 advance debited against P's royalties. Thus, P will be paid the sum of $14,273.42 on 58,884 records following recoupment of recording costs and his advance.

(2) Artist pays record producer.

If an artist hires a record producer to produce recordings of that artist, then recording costs, including the record producer's advance, are recouped by the record company at the "all-in" rate, i.e., the full artist rate without deduction of the record producer's royalty rate. However, an artist will pay a record producer only after recording costs are recouped at the artist's net royalty rate.

This can be illustrated, using the case example cited above, as follows:

R will recoup recording costs at the "all-in" rate, i.e., 10% ($0.8082).

R will allocate recording costs as follows:

$100,000 will be debited against A's royalty account. That portion of recording costs which constitutes P's advance is debited against A's royalties since A, rather than R, is paying P. It will take 123,731 records at the "all-in" rate of 10% ($0.8082) to recoup the $100,000 of recording costs debited against A's royalties.

At the point that 123,731 records are sold, R will commence to pay A royalties at the "all-in" rate. A, however, will not credit P with royalties until recording costs of $80,000 are recouped at A's net royalty rate of 7%. Recording costs of $80,000 are recouped at such rate when 141,392 records are sold. At the point 141,392 records are sold, A will credit P for $34,273.42 and pay him $14,273.48, the difference between such amount and his advance.

A record company may agree, as a courtesy to an artist or to a record producer, to pay a record producer "directly", even though payment of royalties to the record producer is the artist's responsibility. In such event, P's royalties will be computed by R as if A will be paying P. sooner, because the rate of recoupment is higher.

(3) Independent production company or distributed label pays record producer.

If a record producer produces an artist for an independent production company or a distributed label, recording costs may be recouped at the "artist's net royalty rate," or company's net royalty rate. However, the "artist's net royalty rate" will be defined as the difference between the royalty rate paid to an artist by the independent production company or distributed label, and the royalty rate payable to the record producer producing the artist. The company's net royalty rate will be the difference between the royalty rate payable to the independent production company or distributed label, and the royalty rate payable to the record producer producing the artist, i.e. 9% ($0.7272).

An independent production company or distributed label is a middleman between a record company and an artist, and makes a profit on the difference between the royalty paid by a record company to the independent production company or distributed label, and the royalty the independent production company or distributed label pays to the artist and the record producer. Thus, for example, an independent production company or distributed label may receive an "all-in" royalty of 12% of the suggested retail list price, and pay an artist and a record producer, respectively, a royalty of 10% of the suggested retail list price.

Using the case example cited above, the "artist's net royalty rate," would be 7% ($0.5658). It would take 141,392 records at such rate to recoup the $80,000 of recording costs debited against the artist in the above example. At the point 141,392 records are sold, the independent production company or distributed label will credit P for $34,273.42 and pay him the difference — $14,273.42 — between such amount and his advance.

Using the case example cited above, it would take 110,011 records at the company's net royalty rate to recoup $80,000 of recording costs debited against the artist in the above example. At the point 110,011 records are sold, the independent production company or distributed label will credit P for $26,666.66, and pay him the difference — $6,666.66 — between such amount and his advance.

(4) Multiple producers.

A record producer's royalty may be prorated among all record producers producing an artist. If a record producer's royalty is prorated, recording costs to be recouped should also be prorated so that a record producer will be paid royalties following recoupment of the recording costs on the recordings produced by him, and not the aggregate recording costs for the recordings of all the record producers who worked on an artist's project.

This can be illustrated using the case example cited above, as follows:

R hires P#2 to produce two additional recordings of A; to record new vocals on two recordings produced by P; and to remix one recording produced by P. R agrees to pay P#2 a royalty of 3% of the suggested retail list price on the new recordings, a royalty of 2% of the suggested retail list price on the recordings with new vocals, a royalty of 1% of the suggested retail list price on the re-mixed recording, and a $2,000 advance against royalties. Recording costs, including the P#2's advance, rise to $108,000. The new recordings cost $2,000 each; the recordings with new vocals $750 each; and the remixed recording $500. P has already produced eight recordings. A's record will contain a total of 10 recordings.

R will allocate recording costs as follows:

With respect to P, $80,666.66 will be debited against A's royalties. The recording costs debited will consist of the $80,000 of recording costs on the eight recordings produced by P, plus one-third of the recording costs for the recordings with new vocals ($500), and two-thirds of the recording costs for the recording that was re-mixed ($166.66). The proration of one-third of the recording costs for the recordings with new vocals, and two-thirds of the recording costs for the re-mixed recording, is based, respectively, on the proration of P's royalty rate for the recordings with the new vocals to 1% (P's royalty of 3%, less P#2's royalty of 2%), and for the re-mixed recordings to 2% (P's royalty of 3%, less P#2's royalty of 1%).

It will take 142,571 records at the artist's net royalty rate of 7% ($0.5658) to recoup $80,666.66 of the recording costs debited against A's royalties.

P will be paid a royalty of 3% on five recordings (or one-half of the total number of recordings); a royalty of 2% on one recording (or one-tenth of the recordings); and a royalty of 1% on two recordings (or one-fifth of the recordings). Thus, P's royalty is $0.15352. It will take 130,272 records at P's royalty rate to recoup the $20,000 advance debited against P's royalties. At the point 142,571 records are sold, R will credit P for $21,887.49, which constitutes P's royalties for the 142,571 records sold, and will debit P for $20,000, which constitutes P's advance. P will thus be credited with the sum of $1,887.49 on 12,299 records, following recoupment of recording costs and his advance.

If R treats the $8,000.00 of new recording costs as excess recording

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costs, and deducts the amount of such costs from P's royalties, P will not be paid the sum of $1,887.49. Moreover, his royalty account will be debited with $6,112.51, the difference between $1,887.49 and $8,000.

With respect to P#2, $5,333.34 will be debited against A's royalties. It will take 9,426 records at the artist's net royalty rate of 7% ($0.5658) to recoup $5,333.34 of recording costs debited against A with respect to P#2.

Since P#2's royalty is prorated, P#2 will be paid a royalty of 3% on two recordings (or one-fifth of the total number of recordings); a royalty of 2% on two recordings (or one-fifth of the recordings); and a royalty of 1% on one recording (or one-tenth of the recordings). Thus, P#2's royalty is $0.08888. It will take 22,502 records at P#2's royalty rate to recoup the $2,000 advance debited against P#2's royalties. At the point 9,426 records are sold, R will credit P#2 for $837.78 for the 9,426 records sold. P#2, however, will not be paid royalties on records following recoupment of recording costs until his advance has been recouped. P#2's advance will be recouped when an additional 13,076 records have been sold.

(5) Payment to record number 1 following recoupment of recording costs.

A record producer is paid royalties "retroactively to record #1" following recoupment of recording costs. This means that when recording costs are recouped, i.e. when a sum equal to the number of records sold, multiplied by the applicable royalty rate (artist's net royalty rate, all-in rate, or other applicable rate) is earned and equals recording costs for the project, a record producer is credited with a royalty for each and every record sold, including those records sold before recoupment of recording costs. Thus, a record producer is credited with royalties for all records sold, but the payment of such royalties is deferred until recording costs are recouped. An artist is also credited with royalties for all records sold, but royalties credited to an artist are retained by a record company to recoup recording costs. Thus, an artist is paid only for records sold after recording costs are recouped.

The record producer should always insist that a provision concerning payment to record #1 be inserted in his record producer contract, so as to avoid any risk of being paid in the same manner as the artist, i.e. only for records sold after recording costs are recouped.

(f) Double recoupment

A record company, artist, independent production company, or distributed label may recoup a record producer's advance twice — once as a recording cost, and once as a debit against a record producer's royalties — thereby postponing or preventing the payment of royalties to a record producer unless language prohibiting such "double recoupment" is inserted in that record producer's contract.

This can be illustrated as follows, using case the example cited above:

R might debit $100,000, the full budget including the record producer's advance, against A's royalties; and $20,000 against P's royalty. It will take 176,740 records at the artist's net royalty rate of 7% ($0.5658) to recoup $100,000 of recording costs. It will take 82,508 records to recoup the $20,000 advance debited against P's royalties at his royalty rate of 3% ($0.2424).

At the point 176,740 records are sold, R will credit P for $42,841.77, which constitutes P's royalties for the 176,740 records sold, and will debit P for $20,000, which constitutes P's advance. P will thus be credited with the sum of $22,841.77 following recoupment of recording costs, which already include P's advance and, once again, the advance.

If A's royalties had been debited with $80,000 in recording costs instead of $100,000, A would have recouped recording costs at the point 141,392 records were sold, i.e. 35,348 records sooner. Moreover, P may never have received payment for 141,392 records if 176,741 records were not sold, because P's royalties would not be credited to his account until recoupment of recording costs.

B. Accounting

1. Statements and payments

A record producer may receive statements and payments of royalties from a record company, artist, independent production company, or distributed label. The most preferable arrangement for a record producer, regardless of the person or company who hires him, is to be directly accounted to and paid by a record company, because the intervention of a middle-man, artist or company may substantially delay the receipt of statements and payments by that record producer. However, "direct payment" is not always possible, since an artist or a company who has hired a record producer may insist on making payments and preparing statements, or a record company may refuse to directly pay a record producer hired by an artist or a record company.

A record company usually will render statements and pay royalties to an artist, independent production company, or distributed label semi-annually, 60 to 90 days after the last day of March and the last day of September, or the last day of June and the last day of December. A record producer contract may provide that an artist, independent production company, or distributed label may render statements and pay royalties to a record producer 60 to 90 days after a statement has been rendered by, and royalties received from, the record company. Thus, a record producer's receipt of a statement and royalties may be delayed by as much as three months by the accounting practices of an artist, independent production company, or distributed label. Direct payment should be requested or, at a minimum, a record producer should be accounted to and paid not later than 15 days after a record company accounts for and pays royalties to an artist, independent production company, or distributed label.

A record producer should also require an artist, independent production company, or distributed label to furnish to him copies of all statements furnished by a record company to the artist, independent production company, or distributed label. However, while an artist, independent production company, or distributed label may agree to make payments within 15 days following the receipt of royalties from the record company, but it may insist on preparing the statement. If there is more than one record company manufacturing and distributing records of an artist produced by a record producer, statements should be required for each such record company. If a record producer is performing services for an independent production company or distributed label that receives a combined statement for a number of artists, he should request the independent production company or distributed label to furnish him with that portion of the record company statement relating to the artist he produced.

2. Reserves

Record wholesalers and retailers can return unsold records to a record company for credit or exchange. As a result, the number of records that have been actually sold is not usually known until sometime between six months and one year after a record is distributed.

Record companies maintain "reserves" of royalties credited to a record producer against which royalties on returned records can be offset. Typically, reserves constitute 40% to 50% of credited royalties for singles, and 25% to 50% of credited royalties for albums. Reserves are "liquidated," i.e. paid to a record producer, over a period of one to three years, usually in equal amounts.

A record producer will want to require a record company to hold reserves no greater than the reserves being held on the artist that the record producer is producing or, at minimum, to hold "reasonable" reserves, i.e. reserves that do not exceed the amount reserved or the period of liquidation for other record producers of similar stature hired to produce artists by that record company.

When a record company pays royalties to an artist, independent production company, or distributed label, such royalties are payable only on records deemed by the record company to have been sold and no longer subject to a reserve. Therefore, a record

producer will want to require that the amount of, and the period of liquidation for, any reserves held by an artist, independent production company, or distributed label will not exceed the amount of, and the period of liquidation for, any reserves held by the record company with which an artist, independent production company, or distributed label has a contract. This requirement prevents payable royalties from being reserved twice, i.e. "double reserves."

3. Audit rights

An "audit" is the examination of the financial records of a record company, artist, independent production company, or distributed label with respect to royalty payments and record sales. Record producer contracts may or may not contain an audit right. If a record producer contract does contain an audit clause, it may provide that the record producer waives any objection to an accounting if he fails to object within a certain period, usually six months to one year, following the accounting. Artists and companies will usually agree to extend the objection period to one or two years.

In the absence of a contractual right to audit, the record producer may commence legal proceedings to require an accounting. However, an audit right is a record producer's only contracted protection against fraud or inaccuracy in the reporting of royalties, and should always be included in a record producer's contract.

A record company will usually grant a right of audit to a record producer hired by that record company if that record producer requests a right of audit. However, many record companies refuse to grant a direct right of audit to a record producer, even when statements and payments are being rendered directly, if that record producer has not been hired by the record company. They argue that to grant such right to a record producer exposes the record company concerned to multiple audits, which are expensive for that record company and unnecessary for a record producer, who can rely on the artist to exercise his right of audit.

If a record company refuses to grant a direct right of audit to a record producer, he may seek a "piggy-back" audit arrangement with an artist, independent production company, or distributed label. The "piggy-back" right of audit gives a record producer the right to join an artist, independent production company, or distributed label in its audit of a record company. Usually, a record producer cannot initiate an audit; he is only entitled to join in the audit once it has commenced. The expense of the audit is usually divided among the auditing parties in the same proportion as their royalties bear to each other. A record company may prohibit a record producer from exercising a piggy-back audit right by forbidding an artist or company from sharing audit information with any person.

One problem with the piggy-back audit is that an artist, independent production company, distributed label, or record producer may not want to commence and pay for an audit when another party does. An artist, for example, may be waiting for another album to be released before commencing an audit. One solution is to provide that an artist, independent production company, or distributed label may exercise the right to audit within a given period of time, but if such right is not exercised within that period of time, then the record producer may commence an audit.

4. Cross collateralization

(a) With other projects

A record producer must ensure that royalties (and advances against royalties) from a recording project are not "cross collateralized," i.e. set off against advances to, and charges against, the record producer for another project. Cross collateralization may be either "one-way," or "two-way." One-way cross collateralization occurs when royalties from a current project of a record producer are used by a record company to recoup advances on a prior project or projects of that record producer. Two-way cross collateralization occurs when the royalties on the prior project or projects are also used to recoup advances from a current project or projects.

Cross collateralization may also occur between projects at related or affiliated recording companies. Thus, for example, if a record producer is negotiating to produce an artist for EMI America, and previously produced an artist for Capitol, he will want to include a provision in the EMI America record producer contract prohibiting cross collateralization of royalties earned from the EMI America project, with any unearned advances against royalties or unrecouped recording costs of the Capitol project.

Cross collateralization may occur between the projects of the same or different artists. Thus, if the record producer is negotiating to produce an artist for a record company, and he previously produced another artist for the same record company, he will want to include a provision in his record producer contract prohibiting cross collaterization of royalties.

(b) Mechanical royalties

If a record producer is also a writer or owner of songs, he must ensure that mechanical royalties (as opposed to record royalties) are not cross collateralized with unrecouped advances. Thus, for example, if a record producer is negotiating to produce an artist for RCA, and is the owner or author of songs that will be recorded by that artist, he will want to include a provision in the RCA record-producer contract prohibiting cross collateralization of the mechanical royalties earned from the songs and payable by RCA, with any unearned advances of the RCA recording project.

Cross collateralization of publishing royalties and unrecouped recording costs or unearned advances against royalties may also occur between related or affiliated record and publishing companies. Thus, if a record producer is producing an artist for Capitol Records, and his publishing catalogue is administered by Screen Gems Music (a Capitol affiliated publishing company) he will want to include a provision in his record producer agreement prohibiting cross collateralization of publishing royalties (i.e. print, performance, or mechanical royalties on any songs, whether or not recorded by the artist the record producer is producing) earned from the Screen Gems Music administration agreement, with unearned advances against royalties from the Capitol recording project. (There should also be a provision in the administration agreement preventing such cross collateralization.)

C. Travel Expenses

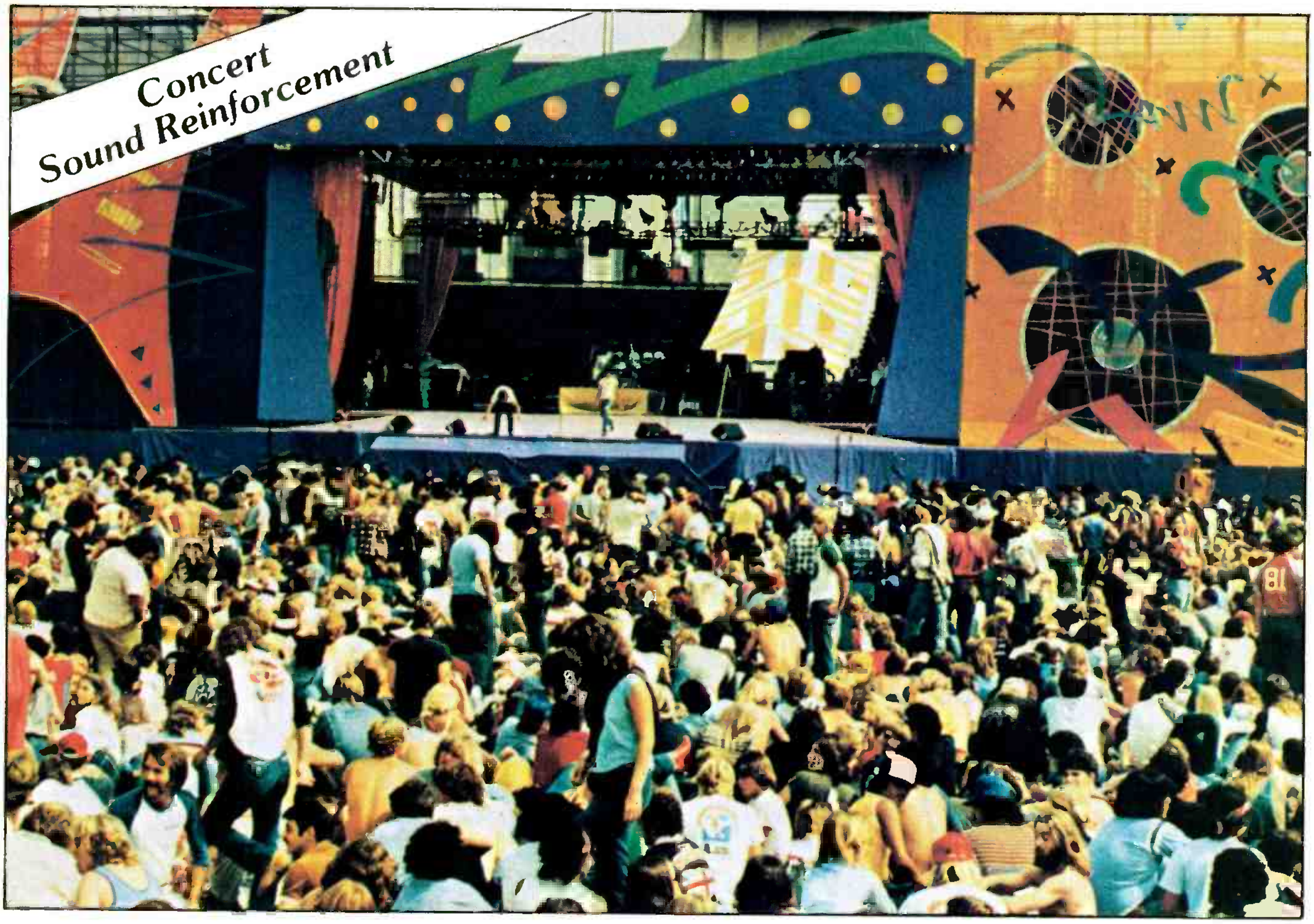
A record producer contract, at the minimum, should provide that if a record producer is requested to travel more than 50 miles from his place of residence, the record company will arrange for, and pre-pay, suitable first-class, round-trip travel by air or ground. Accommodations should be at an agreed upon hotel, or any hotel selected by the record producer within an agreed upon price range, and should be prepaid by the record company at least one week in advance. If a *per diem* is to be paid, it should be paid for each and every day that the record producer is at the place where he is rendering his services, or any other place to which he is requested to travel, including travel days. The *per diem* should be payable on the Friday preceding the week for which the *per diem* is due, so that each week the record producer receives in advance for the next week a sum equal to seven times the agreed daily *per diem*.

A record producer contract should also provide that travel expenses are not recoupable against the royalties of a record producer. Although travel expenses are a recording cost, and therefore are recoupable against the royalties of the artist, such expenses are not advances, and should not be deductible from any other advances payable to a record producer. □□□

* * *

The last installment of this article, to be published in a forthcoming issue of *R-e/p*, will be concerned with a producer's grant of rights, including copyright, record credits, mechanical licenses, and re-recording restrictions.

Concert Sound Reinforcement



Photography by Mel Lambert

SHOWCO

doing the audio for the

THE ROLLING STONES

Tour at the L.A. Coliseum

by Robert Carr

It's safe to say that the recently-completed Rolling Stones tour of America was far from being ordinary. This was the legendary Rolling Stones who, without question, have been the premier rock and roll band for generations of teenagers, and constant companions to the present middle-class America since the band's initial introductions during the rebellious, formative years of the Sixties.

The Stones are the super-group that everybody thought rode to fame and fortune on the coat tails of the Beatles, but who are still going stronger than ever 11 years after the Fab Four's disintegration in 1970. Today, the Rolling Stones comprise one of the few remaining acts whose albums consistently go Gold and/or Platinum on, or before, the day of their release.

Legend has it that nothing connected with the Rolling Stones is normal, or matter-of-fact. The band members are consummate showmen both on and off the stage, and everywhere they go a certain aura of craziness exists. *R-e/p's* brief encounter with Rolling Stonedom proved educational, for sure, but was not without its frustrating aspects as well. Apart from maybe one day, Showco had no rehearsal time with the band prior to going out on the road. So much equipment had to be transported, set up, and torn down, that "relaxing" was a forgotten word on this tour. Equipment checks and system tunings were reduced to a minimum, if not eliminated altogether. Ninety to 100,000 fans flooded the larger outdoor venues show after show. And, in light of all that, the Stones played the largest dollar-grossing tour in the history of Rock and Roll.

Showco was chosen to not only provide sound reinforcement for the tour, but also to contract most of the other services, such as lighting, staging, set construction, trucks, buses, and so on. Since all the outdoor shows were done primarily in massive arenas where no stages exist, United Production Services, which specializes in outdoor shows, was called in to supply the scaffolding, stage construction, and crew. Showlite, a company not affiliated with Showco, was responsible for all the lighting equipment and their support crew.

An oversized stage area, vast amounts of scaffolding, and large number of lights necessitated the

. . . continued overleaf —

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provision of two complete sets of stage and lighting gear. The alternating sets were leap-frogged to every other town on the itinerary, thereby allowing sufficient set-up and travel time between shows.

Showco used only one PA system, however, which was added to or subtracted from depending on whether the show was being held indoors or out. Fortunately, with so many capable subcontracted firms participating to pull the show together, Showco was able to reduce its manpower to a nucleus of five people. The outdoor shows, being more demanding than those indoors in terms of a substantial increase in equipment, required the addition of four more crew members, who were flown in specifically for those dates.

Stage engineer B.J. Schiller handled the house mix for the 1978 Rolling Stones tour of America. He explains the change in attitude between then and now: "On the last tour the band did 12 outdoor shows, and about 15 indoors at small theaters. They wanted to scale down the tour and present a more intimate show. This time they pulled out all the stops. They booked about 15 or 20 huge outdoor shows, with the idea that if the first one sold out, they'd add a second. This whole tour is a money maker.

"Our sound reinforcement philosophy has remained pretty much the same. We've just made the system a lot bigger, with much higher quality. So far I'm very happy with it and the sound."

What is that design philosophy? Jack Maxson, one of the principals behind Showco — and who also mixed house sound for the tour — sees the primary focus as being to "keep it simple, and get the volume out there with very few effects. There's nothing really sophisticated; we just need to reproduce the sound. That's what the band wants."

However, these kinds of large, outdoor venues are not the most ideal place to hold a concert. A sound analysis of the Los Angeles Coliseum before the show revealed a 1.5-second slap echo out of the arc farthest from the stage. Being an outdoor stadium with sections of concrete seats around the entire perimeter, there was really no place to hang damping material for acoustic control; Showco sound engineers were at the mercy of the architect's original plan.

Sound System Loudspeakers

According to Showco, watchword for the entire tour was "efficiency." With only one PA rig that had to be up and ready to go at every show, time needed to be saved wherever possible. The speakers were the first place to start.

The cabinets were conceived and manufactured in-house, and their design reflects insight garnered from Showco's years of road-show experience. Rods for the rigging hardware extend all the way through the box. That way, the cabinet bears none of the weight, and hence none of the stress, normally associated with flying speakers. Hanging straps can be left with the cabinets, because the pockets are cut an extra inch deeper to accommodate them. In this way the common hassle of trying to locate straps before or after a gig is eliminated.

On one end of every box are four pieces of ½-inch square steel stock arranged in a square frame of standardized dimensions. A complementary steel frame is built on a dolly (there's a dolly for every speaker cabinet), which quickly attaches via two Simmons latches to the bottom of any cabinet. This technique affords a sturdy and dependable method of transportation.

"It's just little considerations like this that save time and work," Maxson considers. "We can put this system up inside in an hour — that's 20 pairs, or 40 cabinets, for an indoor show."

Two principal speaker configurations dominate the Showco PA system. One type of cabinet reproduces bass frequencies, and houses four JBL K- or E-140s in a proprietary pyramid design. The other type, a 3-way system, handles low-mids with a pair of JBL K- or E-120s; mids through two JBL 2441s; and the highs via Motorola rectangular tweeters arranged in parabola array inside the cabinet. The house system cabinets measure 2½ feet by 5½ feet, and weigh very close to 300 pounds a piece.

In order to cover the 100,000 seat L.A.

House mixer Jack Maxson a the Series 2400 console.

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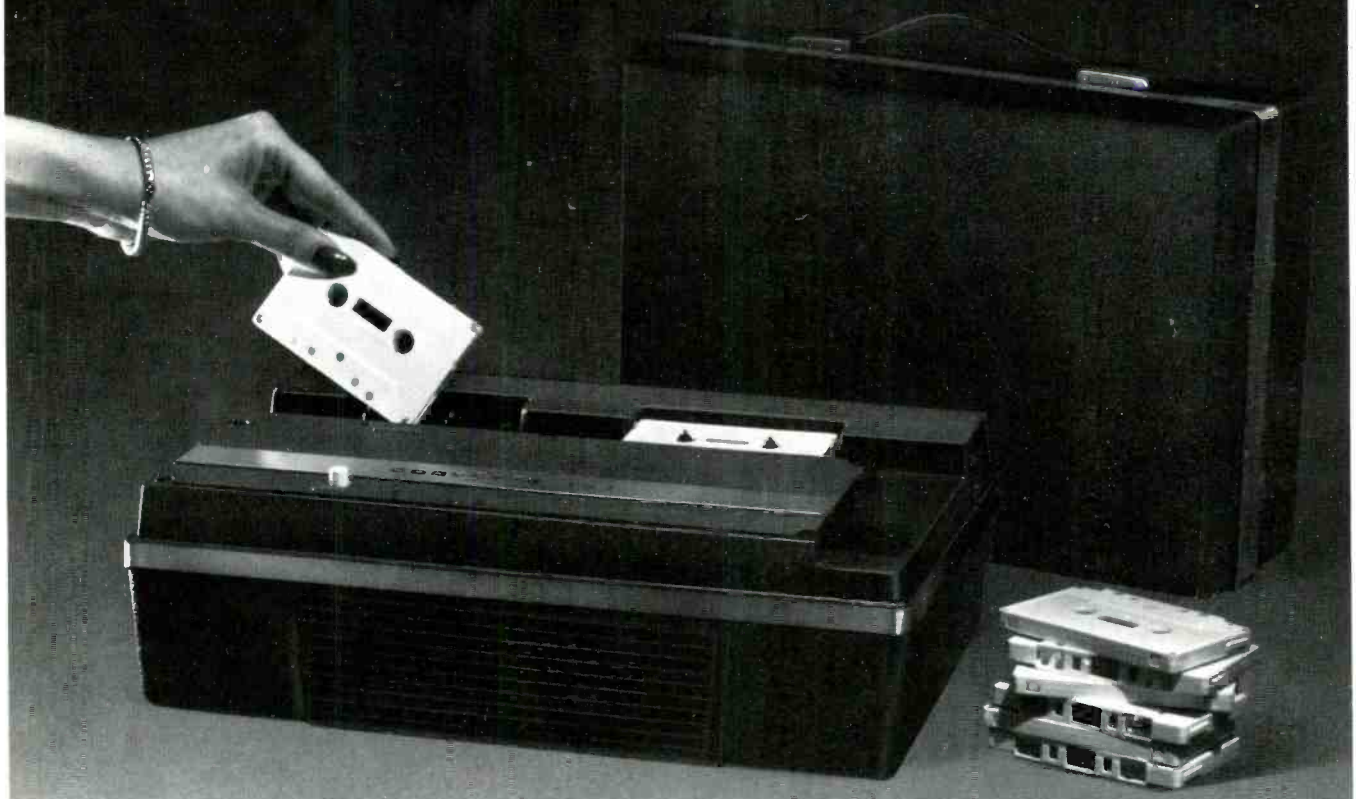

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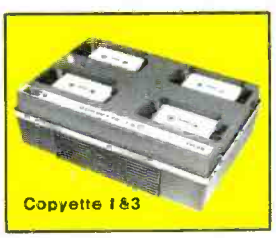

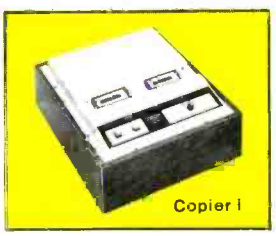

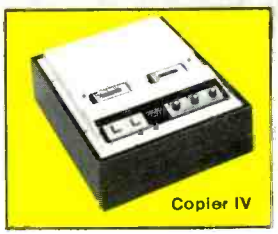

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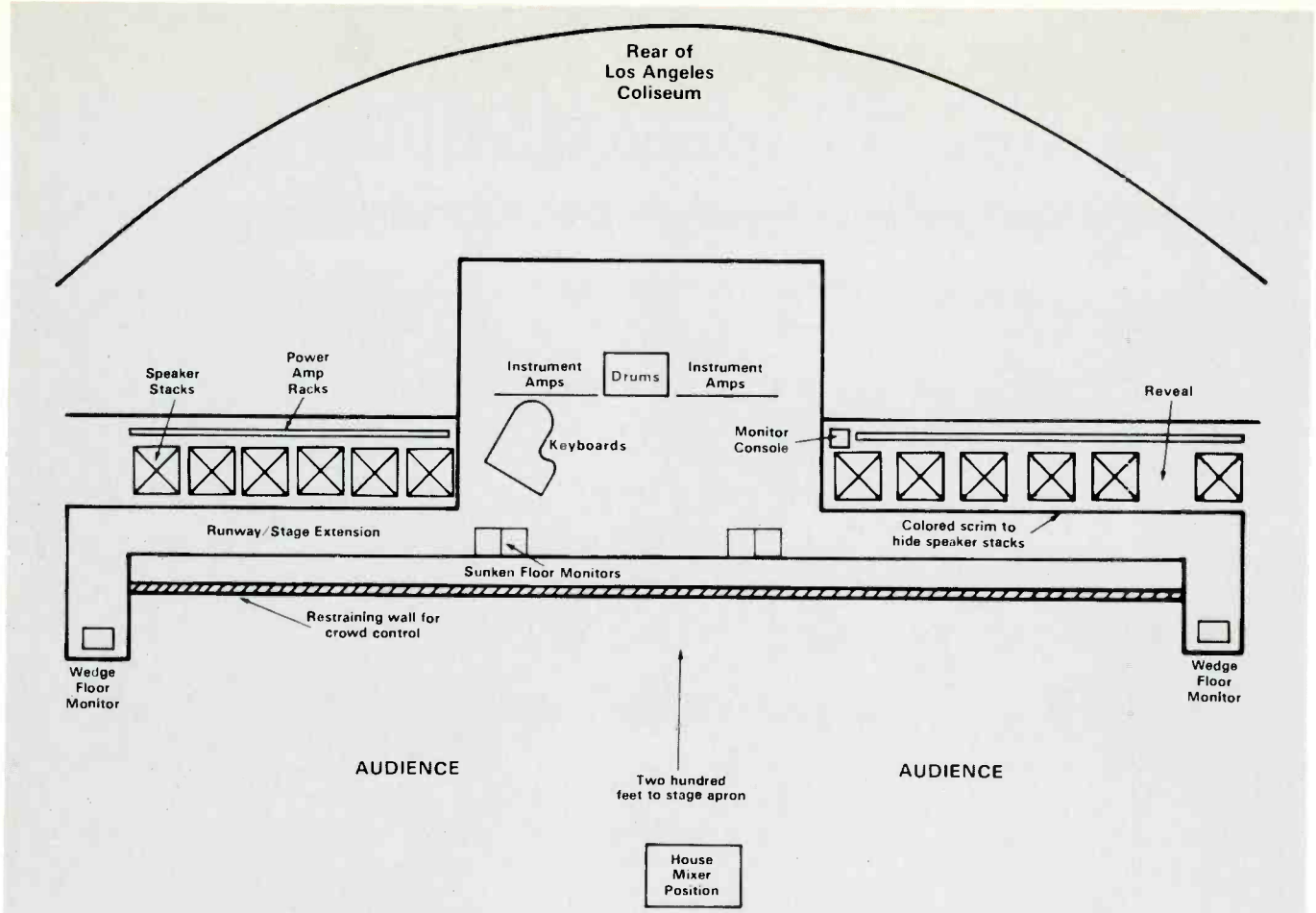

Figure 1: Stage design and speaker layout for Los Angeles Coliseum Concerts, October 1981

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Tour at the L.A. Coliseum

Coliseum, speaker cabinets were stacked 12 high with six stacks on either side of the stage (Figure 1). The two sides were mirror images of each other.

"We're doing what we call 'checkerboard' set-up," Maxson explains, "rather than run a whole column of bass cabinets, a column of 3-ways, a column of bass, and so on, which we tried for the first two shows. We found that configuration was a little too 'beamy'; we got too much coupling.

"Starting at the outside stack, the top three cabinets are 3-ways. The three under those are bass, then three highs, and three lows. The next row is just the opposite, with the three bass cabinets on top. As you look at the arrangement, you see it's a checkerboard pattern.

"Checkerboarding provides a much more even response. As far as I'm concerned, sound reinforcement in venues like this is a compromise. You can have good coverage with less coupling and volume, or more coupling and a little more volume, but not quite as good sound."

At stage left there is a break in the stacks which makes the length on that side look deceptively longer. The hole, called a "reveal," enables Mick Jagger to pass through the wall of speakers on to a "cherry picker," or power lift, which raises him above the audience during the finale of the show.

A decoratively colored scrim (the artwork escaped from the pages of Andy Warhol's *Interview* magazine) covers the entire audience side of the system, and hides the PA speakers from view.

The stage area is about 15 feet high, and speakers rise another 30 feet or so off that base. Strong winds are always a danger, and the columns had to be secured to protect the equipment, workmen, and fans. Because of the intense weight involved — each stack turns the scales at about 3,600 pounds — the bottom few speakers are not secured. The top six cabinets, however, are held together with ratchet-tightened straps that squeeze the boxes together to form, effectively, one solid unit. At the eighth cabinet up, straps connect to the scaffolding for additional stability. In all, about 10 straps are required per stack (Figure 2).

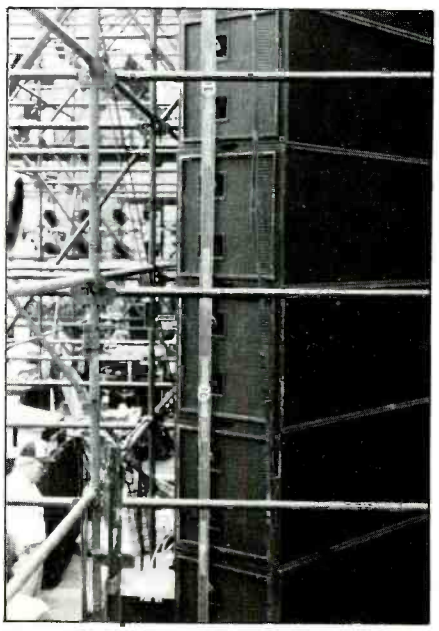
The setup for inside venues make use of a third as many cabinets as outdoors. Normally, the speakers are not checkerboarded in the flown configuration.

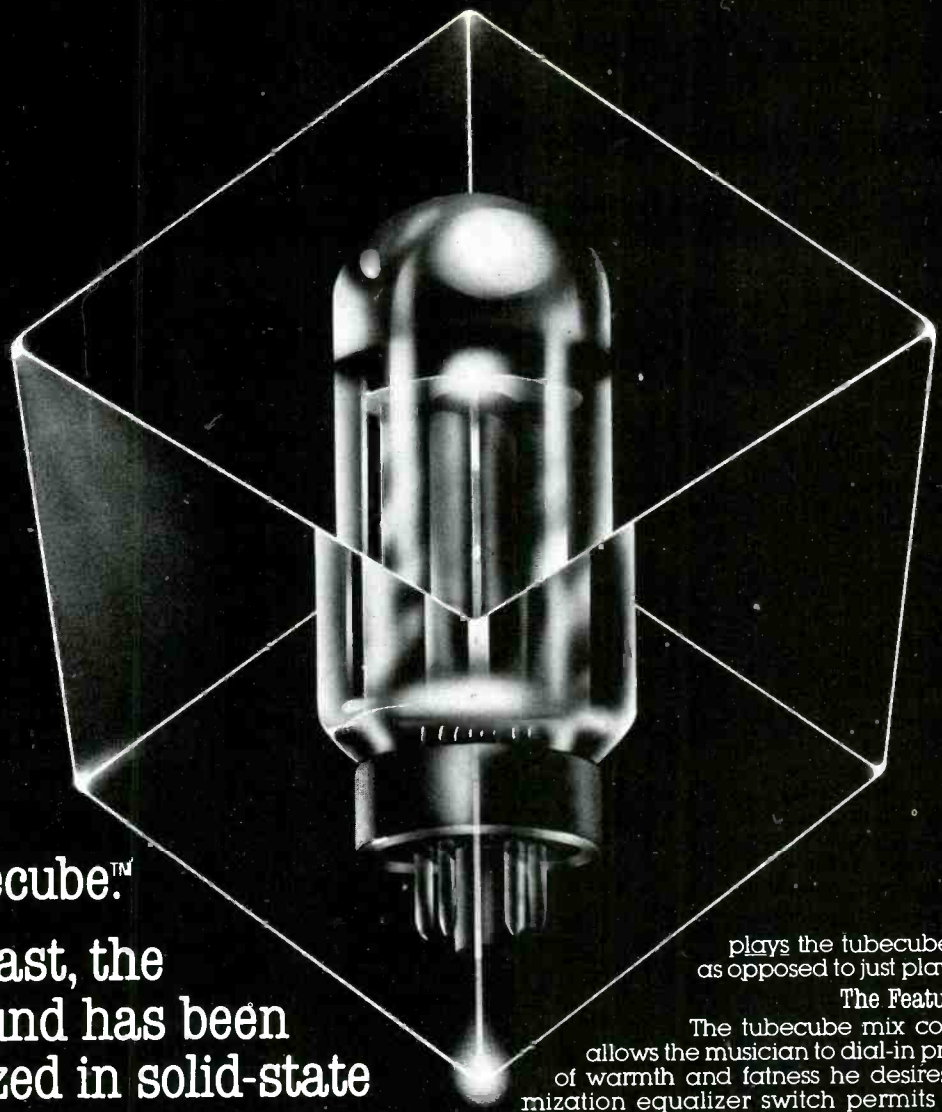
"We arrange all the bass cabinets on top, and the 3-ways underneath," says Maxson. "The 3-ways are suspended from the cradle or hanging frame by ratchet straps. We can arc those speakers in the horizontal or vertical plane by as much as 30 degrees, or leave them in a dead hang."

Power Amplifiers

Power rating for this Showco system is approximately 110,000 watts, which is generated by 135 power amplifiers — 108 of those being in the house system,

Figure 2: SHOWCO bass and three-way speaker cabinet stacks.





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Other features include selective line or instrument input levels, a link jack, balanced and unbalanced outputs, a ground hazard indicator lamp to protect the body from ground loops and excessive doses of energy, and a ground lift switch. The TC-101 operates off of two 9 volt batteries, or from the console phantom power supply.

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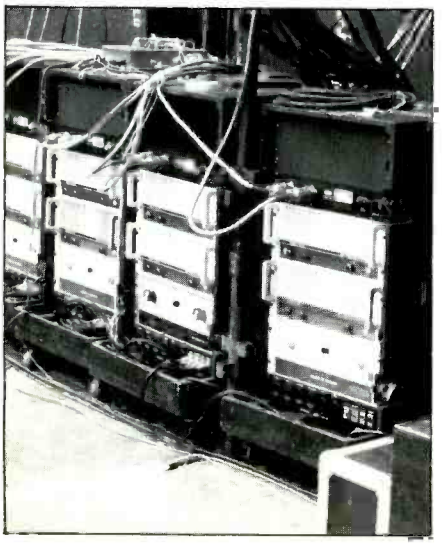
and the rest supplying the monitors. Distribution is broken down such that each rack of three amplifiers powers two sets of cabinets: two bass and two 3-ways (Figure 3). The bottom amp is a Crown PSA-2 bridged into 4 ohms for about 1,200 watts into two bass cabinets. The middle amp — a Crown DC300A — drives the low-mid drivers of the two 3-way cabinets, running bridged into 8 ohms for an output of about 600 watts. The DC300A and the PSA-2 units are used interchangeably, since their power output bridged into 8 ohms is about the same.

The top PSA-2 amplifier powers both the 3-way cabinet's mids and highs. The left side, being loaded down to 4 ohms, has a rating in the vicinity of 300 to 400 watts. Power from the right side, according to Jack Maxson, "is hard to figure out, because the high-frequency units are voltage devices rather than current devices. They're not passively crossed-over, but rather actively crossed-over out at the house console. We've found that if we cross them over passively, or at too low a frequency, they tend to be a little dirty. However, if we do a nice 18 dB per octave roll-off at 7 kHz, the highs are clean and bright — just the way they're supposed to be. We figure a total output for the rack of between 2,700 and 3,000 watts."

"There's a reasonable demand on the equipment," Maxson continues. "It's not like the amps are just idling. The mids and highs aren't working that hard, but the lows and low-mids are working pretty close to maximum. I don't worry too much about the amps clipping; that's what the dbx Model 162 limiter at the house console is in the line for. The bottom-end comes the closest to clipping, but I phone up to the stage to make sure I'm not in danger. Even if the amps did start to clip, it probably wouldn't be too audible — but it wouldn't have done the speakers any good, either!"

Figure 3: Amplifier racks containing a single Crown DC300A and a pair of PSA-2 units, used to power two pairs of cabinets.



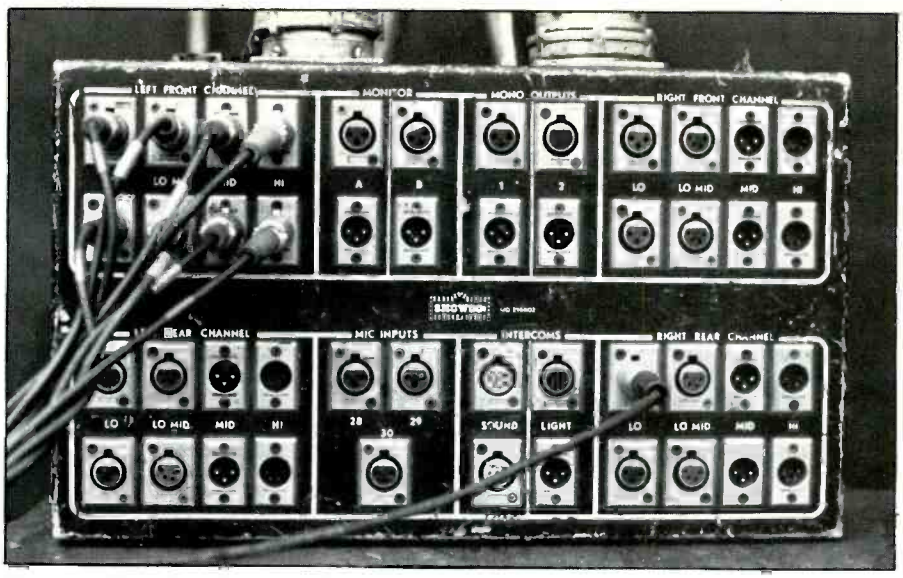


Figure 4: Line-level signals from the house console are passed through a 4-way crossover at the house mixing position, then distributed to the relevant amplifier racks via custom-built splitter boxes.

To run the feed between the amps and speakers, Showco uses either 16- or 14-gauge wire. The speakers wired in series are 16 ohms, and by using 8- or 16-ohm loads wherever it can, Showco has been able to get by with using lighter gauge wire. So far, their engineers report that they haven't experienced any loading problems.

Showco can run its system on 200 amps per leg of 3-phase power. Whether or not they're on a separate 3-phase system from the lighting equipment doesn't seem to matter. Grounding buzz or hum is another common demon that doesn't care too much about terrorizing this PA. Jack Maxson is a great believer in using electrical case ground: "I don't like water pipe ground or anything like that; I want something to blow the fuse. Water pipe ground won't necessarily break an electrical circuit. I always opt for a mechanical ground on the disconnect or whatever."

In terms of a grounding scheme, the Showco rule seems to be "more is better."

"The way we operate," says Maxson, "is to just ground everything to everything. We incorporate ground lifts in strategic places, but basically all amp racks are electrically grounded. In addition, all the amplifiers have hard-wire grounds going from one amp to the next, as well as from one amp rack to the next. It's the old brute force grounding method. There is room for loops, but that doesn't appear to be wrong for us. We tie together 36 racks, and don't have a peep out of the system."

Speaker Testing

Showco relies on two basic procedures to check the status of its speakers at any given time. At least once a week or so, when the boxes are down on the floor, a simple resistance check will be made with a test meter. This can be before or after a show, or any other time that is convenient. Holding true to efficient design, a small, metal testing strip has

... continued on page 72 —

Figure 5: One of two equipment racks located at the house mixing position. From top to bottom, a Klark-Teknik DN-60 spectrum analyzer; Showco Model 1015 line amplifier and 4-way crossover unit; a pair of MXR 31-band graphic equalizers; dbx Model 165 and stereo Model 162 compressor/limiters; patch bay; and Crown D-75 headphone and intercom amplifier.

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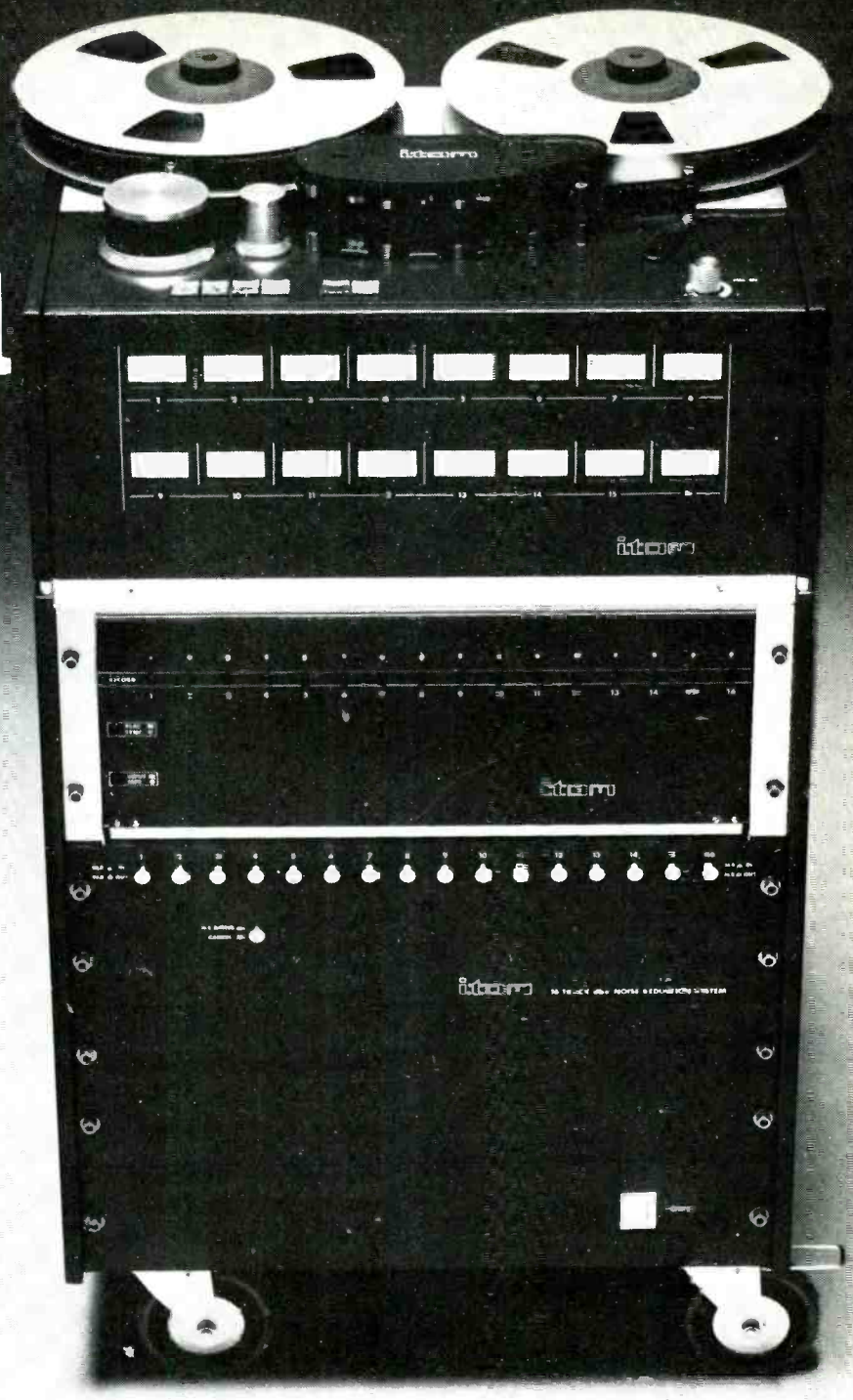

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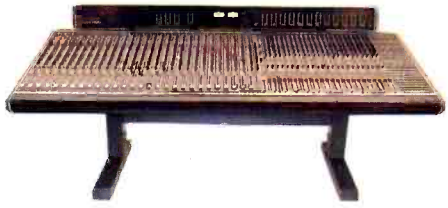

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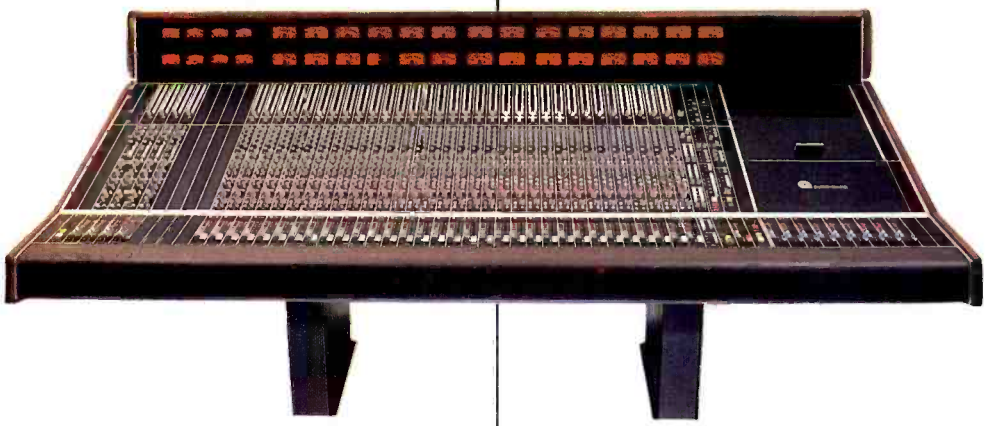

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SHOWCO
doing the audio for
THE ROLLING STONES
Tour at the L.A. Coliseum

— *continued from page 68 . . .*

been installed just inside a trap door in the back of each cabinet. The strip is divided into sections that affords individual and direct access to every component. Needless to say, it makes checking a very quick, and simple process.

A cassette check or pink noise test is done daily. Jack Maxson describes their procedure: "There are two sets of speaker cabinets on each rack. After everything is lashed up, one of the crew will go along and disconnect one set from all 18 racks. Then he'll go back down the line, turning on and off the lows, then low-mids, then mids, and finally the highs at every rack. When he's completed the entire set of 18 amp racks, he'll go down the line a third time, this time unplugging the first set of speakers, and plugging in the second set. A fourth run down the line tests that set the same way as the first set. As long as we don't detect anything out of the ordinary, he'll make sure both sets are reconnected properly, and then go to the other side of the stage, where he repeats the entire process.

"We do that every day. If any problems or weaknesses show up, we log the speaker number, and do a resistance check and repair as soon as we tear down the system. The cassette we use is a music tape, and the pink noise is from a generator. We don't do signal sweep on the road, only in the shop. If the cassette and pink noise don't work, something else is wrong."

House Console Interface

A 27-pair snake connects the house console to two identical drive boxes — one on either side of the stage — located near the amp racks (Figure 4). Four sets of drive lines — one set each for low, low-mid, mids and highs — run in parallel to each box. Back at the outboard rack next to the house console (Figures 5 and 6) is the master panel: a combination crossover and line-drive unit. Built into it are a mother board along the bottom, and provision for interchangeable cards that permit the switching of crossover frequencies (the present frequencies being 300 Hz, 1.2 kHz and 7 kHz). The panel also houses four line-drive amplifiers.

As Jack Maxson points out, "We're driving 18 amp racks with each drive box. By the time you add up the characteristics of 18 racks you find you need a pretty low drive impedance to take care of all those amplifiers. We put the crossovers here at the house position, and have always done it that way. We don't understand why everyone doesn't; it's a major advantage.

Figure 6: The second equipment rack contains (top-to-bottom): 2 dbx Model 903 compressor/limiters (backing vocals and DI bass), and six Model 904 noise gates (floor tom, rack tom, guitar submaster bus, acoustic grand, and two spares); Lexicon Prime Time DDL (lead vocals); TEAC C-3 cassette machine; custom-built unit for monitoring AC line voltage, and console stereo left/right output selection; and an unused effects mixer.

"System parameters can change while you're doing a mix; there may be something that sucks the low-end out of the system. I'd prefer to just increase the drive level of the bass cabinets, rather than do a bunch of cranking on my graphic equalizer. Plus, the drive offers the added advantage of peak indicators that give me a better idea what's going on while I'm mixing."

Also included in that snake are three additional mike lines (numbers 28, 29, and 30 — 1 thru 27 are on their own separate multicore); the PA intercom that runs directly into the board and solo system; a lighting intercom cable in case the lighting company wants to use it; two independent mono feeds available for a camera or video backstage; and two effects sends.

House Console

Showco designs and builds its own mixing consoles too, although the one on the Stones tour is an earlier model — a 2400 Series (Figure 7). The 30-in/8 subgroups/stereo-out board features quad pan pots, pre/post monitor sends, 3-band parametric EQ (300 to 800 Hz, 660 to 5.5 kHz and 2.5 to 18 kHz), pushbutton routing, and selectable pre/post echo/effects send.

According to Maxson, "There's no worry about overloading the house board; there's plenty of headroom. The red light just above the panpot is a 'soft' indicator; there's a couple of dB leeway. I called up on stage to see if the IOC indicators on the PSA-2s were kicking up for the bass. I just drive the amps to the point where we were getting occassional flashing on the IOC's, even though the light was solid red out here in front. We like to leave a little slop every place."

Later Showco consoles have a red/green LED that signals two levels. A green light indicates the area between +4 and +18 dB. Anything over 18 is red, and it really means "Watch out! Levels are very close to clipping!"

The Rolling Stones kept basically to the same show from night to night, although at least one or two songs would be added or subtracted to please the crowd. For the most part, however, the sets were adhered to as planned.

With little or no rehearsal before hitting the road, Jack Maxson felt that

Figure 7: SHOWCO Series 2400 house mixing console, equipped with 30 inputs, eight subgroups, and stereo outputs . . .

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3- by 5-inch cue cards were the best course of action for mixing. A card was made out for every song in the group's road repertoire, appropriate cards being arranged in the order of the night's performance. Each card listed the song title, the names of the principal soloists, and when their mike or instrument volume should be boosted or cut.

"I'm a strong believer in cue cards," Maxson admits, "because that way there's no excuse for missing a cue, even if you don't know the material, or aren't that familiar with the group. I sat down with a band member or one of the roadies before the tour, and got most of the cues that way. In my opinion, for a show this big, there's no excuse for not being that professional. It's additional work, yes, but also invaluable insurance."

During the show, it's not unusual for Mick Jagger to be singing while traveling back and forth along the runway. Our astonishment was not so much a reaction to his coordination and performance, as it was to the fact that a vocalist could sing into a live microphone no more than five feet in front of so many speakers powered by so many watts, with a minimum of feedback.

"It is amazing how you can do stupid things like that, and get away with it," commented Maxson. "When we were doing a show with the Commodores at Radio City Music Hall in New York, we had the speakers stacked in much the same way. They'd run out in front of the columns, but we didn't have to drop the volume at all; there was no feedback. In this case, I just bring Mick down about 3 dB from his normal volume."

Stage Miking

All of the vocal mikes used on the stones tour were wireless models. The transmitter/receiver systems were manufactured by Nady, and coupled with Shure SM-58 capsules (Figure 8). Batteries in the power supplies are all alkaline; Showco doesn't bother trying to recharge NiCads.

"The wireless units belong to the group," says Maxson. "We're just maintaining them. The alkalines came with the system, so that's what we use. It's also what Nady recommends.

Although hand-held radio mikes have a gluttonous appetite for batteries, wireless systems do offer one distinct advantage over the conventional hard-wire method: ground isolation. The musicians and crew never have to worry about shocks.

But what about drop-outs?

"We've had that happen only one time on the tour," Maxson concedes. "And that was a couple of songs before the end of the first show in Boulder, Colorado, with Mick's microphone. John Nady said that something came on the channel, and swamped it. At that point, Mick simply grabbed Ronnie Wood's mike, and the show kept on going. In addition, we have a spare set of receiver and wireless mike that is always on-line and ready to go. All they have to do is grab the mike, and we bring the fader up on the board."

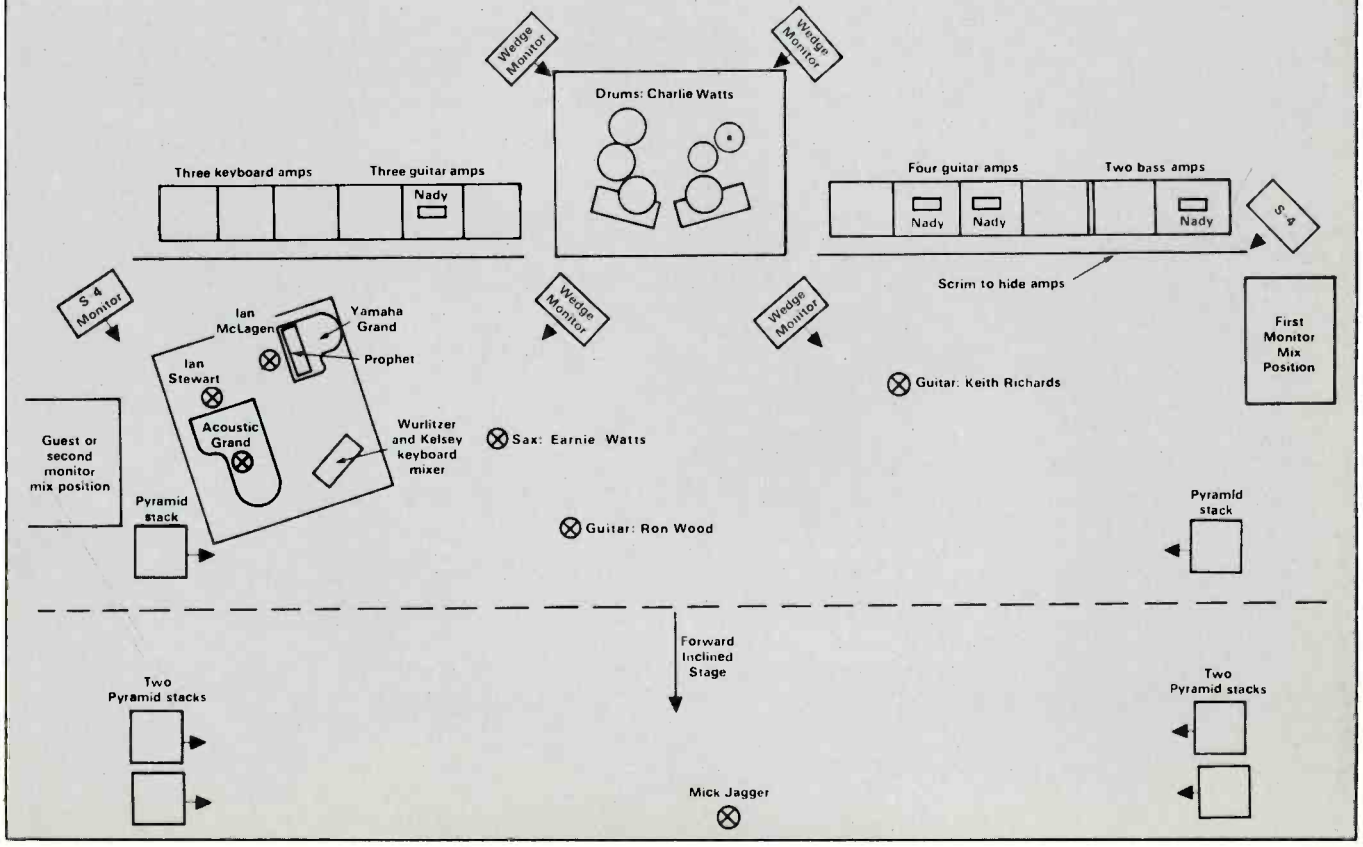
To give the guitar players the freedom to cover as much area as they'd like — occasionally Ron Wood or Keith Richards would run full speed the entire length of the runway, or take a ride up in the scissors lift — transmitters were connected directly to their instruments. Guitar amplifiers were miked with Sennheiser MD421s. The bass was taken direct and miked with an E-V RE-20, and went wireless as well.

Jagger's acoustic guitar also was taken direct right from the wireless unit's output. Jack Maxson feels that he gets better results if he takes the output off the Nady, even though it still goes through the amp on stage.

"I get a direct acoustic sound and a miked electric," he explains. "Direct is so much cleaner for acoustic guitar. It's like anything else; you remove that one step of speaker and microphone. You'll always get some amount of distortion from the speaker cone no matter what you do, and on acoustic guitar you don't want that. On electric, that's part of the sound."

As can be seen from the microphone assignments given in Table 1, all the

Figure 8: Stage layout, microphone placement and monitor locations at the Los Angeles Coliseum.



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keyboards are direct injected, except for the acoustic grand, where the primary sound source is a Helpinstill pickup. The mike on the piano's high-end picked up too much leakage, and was hardly ever used. The sax is hard-wired through a Sennheiser MD441 mike.

One brief comment on the Prophet synthesizer: for some reason, on the day of our visit it was putting something on the line to the console that made the vocal and bass limiters hum badly. The limiters had to be disconnected, which left noise gates as the only console rack gear in service.

"I never limit kick bass," emphasizes Jack Maxson, "and use only enough system limiting to cut off the tops, so nothing drastic can get to the speakers and amps. There wasn't much radical EQ either — just about 12 dB bottom boost on the kick. It really punched! Our parametric EQ was set at about 60 Hz, but it was in a shelving rather than peaking position. For some reason it works better than a broad peak, although it really depends on the type of place we're playing."

The snare was miked on the top and the bottom with Shure SM-57s. For the L.A. Coliseum performance, the top microphone was sufficient to provide the cutting power without all the snare sound. Often that doesn't happen, and the bottom mike is needed to capture the actual snare timbre. The two tones are mixed in varying proportions to achieve the desired results.

The Los Angeles concerts included three other acts on the bill with the Stones: Prince; George Thorogood and the Destroyers; and J. Geils Band. Each group brought its own house engineer(s) — no less than three for George Thorogood's performance — and, in J. Geils case, the band also brought their

Table 1

MICROPHONE ASSIGNMENTS for the ROLLING STONES TOUR

1	High-Hat	ECM-50
2	*(open)*	
3	Overhead *(left)*	SM-81
4	Overhead *(right)*	SM-81
5	Floor Tom	SM-57
6	Rack Tom	SM-57
7	Kick Drum	AKG D-12
8	Snare *(bottom)*	SM-57
9	Snare *(top)*	SM-57
10	High-Hat	Spare
11	Vocal	Spare
12	Mac's Vocal	SM-58
13	Ron's Vocal	SM-58/Nady
14	Keith's Vocal	SM-58/Nady
15	Mick's Vocal	SM-58/Nady
16	Ron's Guitar	MD-421/Nady
17	Keith's Guitar	MD-421/Nady
18	Mick's Electric Guitar	MD-421/Nady
19	Bass	Direct
20	Bass	RE-20/Nady
21	Yamaha Elec. Grand	Direct
22	Wurlitzer Elec. Piano	Direct
23	Prophet Synthesizer	Direct
24	Acoustic Grand	Helpinstill
25	Acoustic Grand	SM-81 *(top end)*
26	Mick's Acoustic	Direct/Nady Guitar
27	Saxophone	MD-441
28	Lexicon Return	
29	Mick's Vocal	SM-58

SUBMIX ASSIGNMENTS

1	Drums
2	All Vocals *(Except Mick)*
3	Mick's Vocal
4	All Guitars
5	Bass
6	All Keyboards
7	Saxophone
8	Special Effects

own monitor system. A 27-pair breakout was employed that plugged into Showco's junction box, and fed the house console.

To save time between acts, drum kits were pre-miked. When a kit and its riser were slid into place, all that was required was for one of the crew members to change the connectors around at the splitter box, and the drum set was ready to go. In fact, Showco is leaning towards equipping all its tours with two complete sets of stage equipment, to avoid the nightmare of tearing down and setting up between acts.

Monitor Mixes

The two monitor engineers for the tour were B.J. Schiller and Rusty Davis. Why two monitor engineers? The reason is quite simple, as we discovered. Indoor concerts feature a rotating amp line and set, which literally blocks Schiller's line of sight from stage left for several songs.

"I can see stage right most of the time," he explains, "but the amp line and drum riser move towards my side of the stage and faces away from me. When that happens, I'm blind; I can't see much at all — just the very front edge of the stage, and that's it. If Mick, let's say, held his microphone in front of one of the monitors, I wouldn't be able to see it in time. I'd just hear feedback, and not know what mike to mute to avoid it."

Monitor mixer B.J. Schiller at Interface Electronics console.

Randy Davis is located stage right, and handles the keyboards and monitors on the extreme right. B.J. Schiller does all the overheads or fill monitors, the monitors down front, and everything stage left. Both boards feature 30 inputs and eight outputs, and are made by Interface Electronics, Houston, Texas.

Showco feeds both of the monitor boards with their own transformer isolated set-up that was built about four years ago. The company circumvents the threat of gain loss at the microphones by incorporating a SESCOM 1-in/4-out isolation transformer into the design.

"It's a setup where all our patches are at the microphones," says Schiller. "The mikes are patched into one box. We can take a parallel split from all those mikes, and send it to one board, plus take a transformer isolated split and send it to four other places. We have the ability to feed five mixing consoles at one time with no gain loss."

The monitor mix criteria is a vocal/drum/guitar wash that shows up in all the monitors. Mixes change

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slightly from area to area, but basically Jagger's vocal is on top; drums are below that, and the guitar last. Depending on the song, the mix may be filled in with a guitar, sax or keyboard lead. For the most part, the monitors are dry; any effects are done in the house feed.

Monitors at the ends of the runways are primarily vocal, snare and kick. Since Jagger is working so far in front of the speakers, the signal from the stacks is slightly delayed. That tends to make him slow down, and work behind the beat. He wants to be able to hear himself in sync with the drums so he doesn't drag the music.

According to B.J. Schiller, "The mix is pretty straight ahead, but I wouldn't say the job is easy. There is so much equipment to set up that we have really never had a chance to tune all the monitors and the PA for even an hour a day.

"By way of an example, we started setting up in the [Madison Square] Garden at 8 a.m. The promoters open the doors for the audience at 6:30 p.m. At 7:30 we were still plugging in equipment. At 8:20, they started the show. If you tune anything, it's usually with the crowd in the hall, which is unprofessional, to say the least.

"In other words, the mix in the monitors gets tuned up during the first two or three songs of the show. That's what I mean by a fairly hard job. If we're way off base with the monitors, then we take a lot of heat from the band."

When the luxury of time does permit, Schiller's EQ philosophy goes like this: "I've had good luck walking around the stage with Mick's vocal mike, and voicing each one of the cabinets. Standing in front of the floor monitors, I can use the crossover controls in the back of the cabinets. The wedges are bi-amped. The bass line has one control, and the upper line has a mid and high tune. I just walk around, and tune them up until they sound real good with my voice.

"I use a 31-band graphic EQ for my problems. If the kick or snare sounds 'honky' or 'tubby', I'll insert a graphic on that particular channel. In most cases I can get off using one or two equalizers, and everything else is straight ahead. I have eight 1/3-octave graphics, and two channels of a parametric EQ. Rusty, at the other board, has four 1/3-octave and four 1-octave units."

The indoor monitor assignments for both boards are given in Table 2. The eighth send for Schiller is used as a solo

Table 2

INDOOR MONITOR SENDS

B. J. SCHILLER:

1 - Hanging fills in front of stage.
2 - Hanging fills on sides of stage.
3 - Three center stage floor monitors up front.
4 - Keith Richards' monitors stage left.
5 - Charlie Watt's drum mix.
6 - Two floor monitors in front of drum kit facing the audience (Mick's mix).
7 - Ernie Watt's mix (sax).
8 - B.J.'s solo send.

RUSTY DAVIS:

1 - Two floor monitors at extreme stage right.
2 - Two floor monitors upstage right.
3 & 4 - Four floor monitors that actually hang over the very back of the stage.
5 - Ian McLagen's keyboard mix.
6 - Ian Stewart's keyboard mix.
7 - Monitor in the scissors lift.

at his board, so that he can hear what any of the microphones sound like. The mikes can be "tuned in" without the band being subjected to the process.

Davis' seventh mix goes to a scissors lift, an industrial device that raises up about 25 feet. The lift resides at the very back of the stage and sports a platform and handrail. One monitor sits on that in the event a band member wants to step on to the platform, and "ride it into the air to give a thrill to the audience in the back of the hall."

The monitor system uses seven amp racks, similar to the ones in the main system. The only deviation from that format is the floor monitor racks, which use four Crown DC300s and drive the floor wedges. (These wedges also utilize the crossover card-rack setup found in the house system.) Inside the slants are JBL components: one K- or E-140, one 2482, and two bullets crossed-over passively.

The pyramid cabinets positioned down front, and as side fills, are powered by three racks of a DC300/PSA combination (or they may be all 300s or PSAs, because the amplifiers are interchangeable). The two Showco S-4 cabinets, containing four Gauss 12-inch bass, four JBL K-100 low-mid, two E-V DH-1012 mids, and four JBL 2402 high-frequency drivers, each run off of a rack with three DC300s wired as though they were driving the pyramid cabinets. To summarize the monitor: that's five racks with three amps each, and two racks with four amps apiece.

* * *

Subjective Assessment of Sound Quality

Before closing, I'd like to make two observations that I feel are important in the context of this article. While standing in the mixing hut, located about 200 feet from the stage apron, I was quite irritated by very sharp, and penetrating portions of the live program material being generated by the opening acts. So loud was the music that I couldn't understand what someone was shouting in my ear. Upon moving no more than one foot to my left, the sound decreased to a reasonable level where I could carry on a conversation in a loud voice. Repeating this motion of stepping on and off the sound axis substantiated my original conclusion regarding the beaminess of the system.

Throughout the day of my visit, I also took a walk around the L.A. Coliseum to obtain an overall picture of the sound quality. Although the material was fairly well balanced at the mix position, and for most areas on the field, the clarity left much to be desired. As I walked off the field and up into the seating area, the bass diminished almost to being non-existent.

In all fairness, I have to include the fact that the acoustics of that particular Los Angeles venue are poor, at best, for loud concerts. Also, with such a hectic touring schedule, the opportunity to apply acoustic controls was practically non-existent. I did not hear the system in an enclosed, and presumably, controllable environment, but I'm sure the quality was much improved. □□

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by Michael Rettinger
Consultant on Acoustics

A floating floor may be defined as a surface structure that is separated from the main horizontal structural base of a building by means of elastic elements, such as cork pads or springs, through which little force can be transmitted. Floating concrete or wooden floors in a noise or vibration sensitive room serve a dual purpose. First, they reduce the transmission of acoustical disturbances from the enclosure to an adjoining lower space; and secondly, they attenuate the transmission of such signals from the lower enclosure into the upper one.

For the effective vertical isolation of sound vibration, the interposed compliant element must be properly loaded. When overloaded, structural safety measures may be infringed upon, reducing the life of the resilient support; when underloaded, the coupling between the floor and the structural slab of the building will be too great, with the result that the isolating part becomes ineffective as a force reducer.

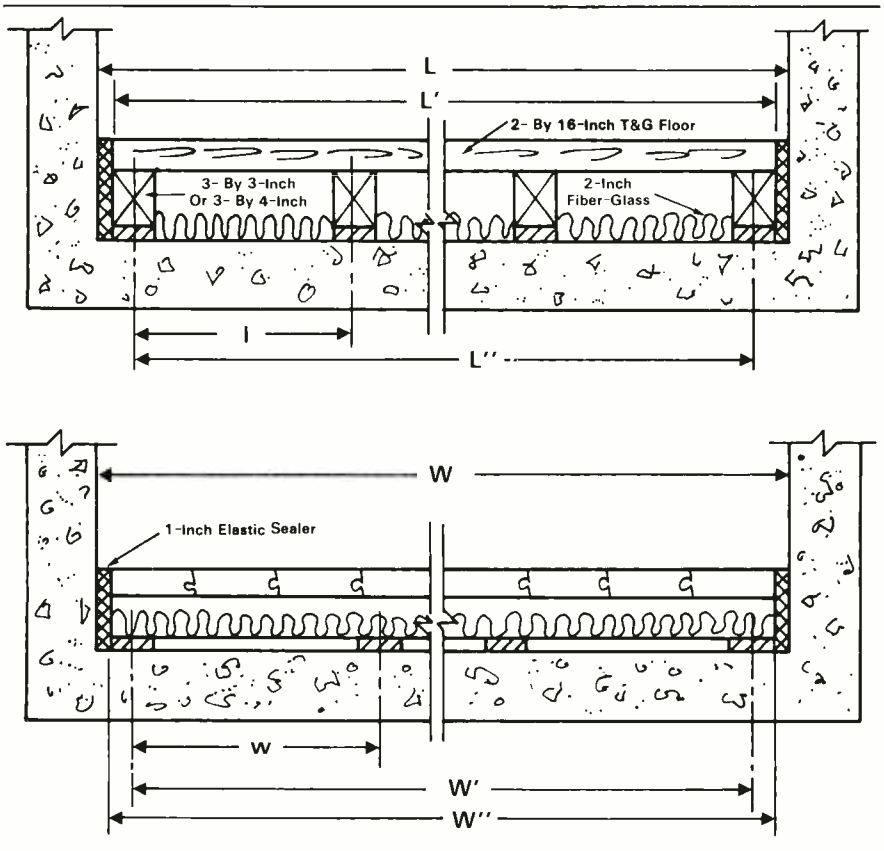


Figure 1: Dimensions and Internal Structure of Floating Wood Floor.
L = length of room, in inches.
L' = length of floor, in inches (=L-2).
L'' = distance between outside joist centers, in inches (=L-5).
l = distance between 1- by 3- by 3-inch elastic pad centers and joist centers.
W = width of room, in inches.
W' = distance between outside elastic pads along length of joists, in inches (=W-5).
w = distance between pads along length of joists, in inches.
W'' = length of floor joists (=W-2).
N_L = number of joists (=L''/l+1=(L-5)/l+1).
N_w = number of pads per joist (=W'/w+1=(W-5)/w+1).
N = total number of pads (=$N_L \times n_w$=[(L-5)/l]×[(W-5)/w+1]).

In general, the cut-off frequency of the system's mechanical low-pass filter should be determined in relation to the exciting frequency of the vibration generator. The filter frequency is given by:

$$f=3.13/\sqrt{d}=5.26/\sqrt{D}$$

where d = static deflection of isolator when loaded, in inches.

and D = static deflection of isolator when loaded, in centimeters.

For the filter to be effective, its cut-off frequency should be at least half and preferably one-quarter of the excitation frequency. Thus, a motor with a 600 RPM rotary speed has an excitation frequency of 10 Hz.

To achieve a low cut-off frequency the static deflection or compression of the elastic pad on application of the load must be large. Hence, in such cases the pad should be thicker than 1 inch. A 4-inch thick pad will provide half the cut-off frequency that a 1-inch thick pad for the same load on the elastic unit, since this frequency is inversely proportional to the square root of the static deflection.

When the air between a floating floor and the lower structural slab has no ready means to escape, the stiffness of the air can raise the cut-off frequency of the low-pass mechanical filter somewhat, depending on the mass per square foot of the floor, and the thickness of the air space. This resonance frequency is given by:

$$f_o=170/\sqrt{Ms}=60/\sqrt{M's'}$$

where M = surface density of the floor, in pounds per square feet.

M' = surface density of the floor, in kilograms per square meter.

s = thickness of air space, in inches.

s' = thickness of air space, in meters.

The combined resonance frequency of the mechanical system due to two "springs" — the elastic pad and the air — is given by:

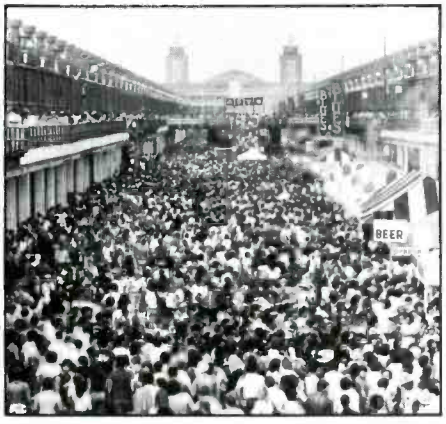
$$F=\sqrt{(f^2+f_o^2)}$$

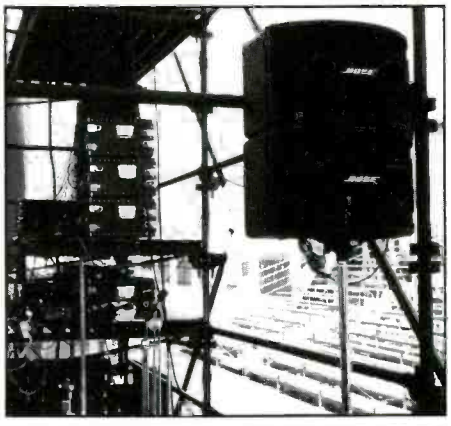
The effect of the air stiffness can be reduced by providing air escape holes in the floor, preferably along the perimeter of the floor in the form of slits.

It may be noted that pneumatic isolators are available that can have a resonance frequency as low as 1 Hz, for cases where extremely low filter cut-off frequencies are necessary.

Floating Wood Floor Design

Consider the example of a studio 24-foot wide and 30-foot long, which is to have an elastically supported wood floor. Referring to Figure 1, the floor joist length, W, becomes 24×12 - 2 =286 inches, if a 1-inch thick elastic sealer (such as an asphalt-impregnated fiberglass board) is to be installed around the perimeter of the





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floor. Joists along the width of the enclosure are preferred over the length because they may be shorter. Also, for good joist support, elastic pads are to be placed at the ends of the joists, thereby avoiding cantilevering the floor around the perimeter. The resilient supports are assumed to be 1-inch thick, and 3- by 3-inches in cross-section. For equal spacings of the pads under the joists, this distance of separation, w, when divided into W' (the center-to-center distance between the outside pads) must be a whole or integral number, n_w, as shown below:

n_w	$w=283/n_w$
8	35.36
9	31.44
10	28.30
11	25.73
12	23.58
13	21.77
14	20.21
15	18.87
16	17.69
17	16.65
18	15.72

The distance w, in inches, is generally selected in terms of the total load that is to be carried by the floor; the greater the load, the shorter the distance. In the case of I-beams, with their higher rigidity over wood joists, this distance w may be made greater.

The required number of pads under the joists, N_w, is one unit larger than the selected n_w, because of the specified end supports of the beams. Thus, if 23.58 inches was selected for w, $N_w = 12 + 1 = 13$ resilient mountings per joist.

The number of floor joists, N_L, may be determined similarly to the number of pads under these beams. Since the center-to-center distance, L'', between the outside joists along the length of the room equals $30 \times 12 - 5 = 255$ inches, the possible integral spacings, n_L, between joists are shown below:

n_L	$l=255/w_L$
8	31.87
9	28.33
10	25.50
11	23.18
12	21.25
13	19.61
14	18.21
15	17.00
16	15.93
17	15.00
18	14.17

Again, the total number of joists, N_L, if there is to be a beam at each end of the room along its length, is one greater than n_L. Thus, if we select a 17-inch spacing between joist centers, the total number of joists, $N_L = 15 + 1 = 16$ joists.

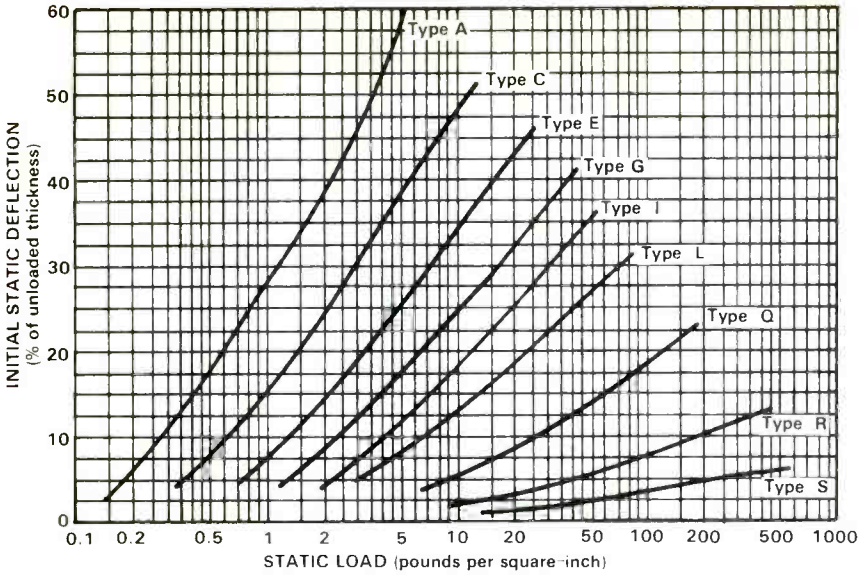

Figure 2: Static deflection of elastic 1-inch thick fiberglass pad on application of load in pounds per square inch, for types of Peabody Noise Control Company isolators.

The total number of pads is $N_w \times N_l = 13 \times 16 = 208$.

The total pad area is $208 \times 9/144 = 13$ square feet, or 1,872 square inches.

If the load on the floor is to be 100 pounds per square foot, the total load, $M = 24 \times 30 \times 100 = 72{,}000$ pounds. The load, k, on the pads per square inch is $72{,}000/1872 = 38.46$ pounds.

Such a load calls for a Peabody Noise Control Company Type Q pad for a 0.125-inch static deflection to achieve a $3.13/\sqrt{0.125} = 8.85$ Hz low-pass filter cut-off frequency for the mechanical system if the excitation frequency is 30 Hz (1800 RPM) — refer to Figure 2.

Floating Concrete Floor Design

The design of a floating concrete floor is very similar to that of the floating wood floor described above. Instead of applying 2- by 6-inch T&G timber planks to the 3- by 4-inch or 3- by 3-inch floor joists, a 1/2-inch thick sheet of external plywood is nailed to these joists. Alternatively, the 3- by 3-inch elastic pads can be cemented directly to the underside of the plywood, using center-to-center spacings evaluated in the manner detailed above. A sheet of 0.005-inch thick Mylar or other plastic is laid on top of the plywood, to prevent the infiltration of moisture from the concrete into the plywood at the time the material is poured. A 1-inch thick sealer is also cemented to the walls along the perimeter of the plywood, to prevent a structural connection between the concrete floor and the walls or the foundation of the room.

If the example room for the floating concrete floor is also 24- by 30-foot, and loading of the concrete plus any machinery on it comes also to 100 pounds per square foot, the same type of isolation pad can be employed that was calculated for the wood floor with the same load. It becomes important, however, to heavily reinforce the concrete floor with steel rods. The floor is not lying on a solid flat surface, but is supported only at intervals, which may lead to cracks and fissures without the presence of reinforcing rods.

For studios, the concrete floor is often covered with a layer of 1/8-inch thick Epoxy, particularly for TV studios. This is for the reason that the floor of such a studio is often painted with a water color paint for scenic reasons; without the Epoxy, it is difficult to wash this paint off without leaving a stain on the untreated porous concrete. □□□

IS THERE LIFE AFTER DIGITAL?

by NEIL BRODY

THE END OF THE ANALOG DISK ?

Ever since the advent of analog tape recording, we have been hearing various predictions regarding the death and "certain demise" of the conventional phonograph record, still the most popular means of storing and reproducing audio information. Today, with digital recording in wide use at studios throughout the world, and the binary-encoded digital disk seemingly right around the corner, the death knell for the analog disk is again being sounded.

This article, which takes the form of a symposium-style interview, conducted individually with several of America's top disk-mastering engineers, attempts to determine exactly what is the state-of-the-art in disk mastering today, and where it might be heading tomorrow. Those interviewed were: *Larry Boden* of JVC Cutting Center, Los Angeles; *Terry Dunavan* formerly of Elektra Records, L.A.; *Greg Fulginiti* of Artisan Sound Recorders, L.A.; *Brian Gardner* of Allen Zentz Mastering, L.A.; *Bernie Grundman* of A&M Records, L.A.; *John Golden* and *Bill Lightner,* of Kdisc Mastering, L.A.; *Bob Ludwig* of Masterdisk, New York; *George Marino* of Sterling Sound, N.Y.; *Ken Perry* and *Wally Traugott* of Capitol Records, L.A.; and *Doug Sax* of The Mastering Lab, L.A.

Today with so much existing technology already available for the recording and mass production of a wide range of audio products, and various new systems being developed and perfected all the time, the question of which technological formats will best suit the demands of an ever changing consumer market becomes increasingly more challenging and confusing as more new options become available.

"Ever since I got into the industry in 1965," says Doug Sax of The Mastering Lab, "I've heard rumors that the phonograph record will be no more. There have always been rumors of its death, yet in its present form the analog record is still a very musical medium — with all its faults."

Bob Ludwig of New York's Masterdisk agrees: "I believe that the analog disk, which has been around for a very long time now, still has inherently the greatest storage density, and the possibility of containing more bits per square centimeter than any other existing storage medium. You don't need parity checks, and it's amazingly accurate; it's something that will always be reckoned with. If something better were to come along I'd be all for it, despite how I make my living.

Bernie Grundman of A&M Records sees digital's real advantage from a mass-production standpoint: "In the end, it's going to be a digital disk, because it holds the promise of making a disk that has no noise and no wear.

"While I think analog sounds a little better now, digital sounds more defined, but more 'lifeless.' Digital will sound better after going through the pressing process, because in analog there's a significant loss, no matter who presses it. Even the finest pressing has a certain loss of quality from the lacquer disk; it's inherent in the process we use. With the digital disk, we have the possibility of putting out a product that is closer to the master tape than anything we have ever mass-produced before."

The possibilities seem endless. As George Marino of New York's Sterling Sound envisions it, "At some point in the future, I see placing a call to some subscription audio outfit that will furnish music to our homes over the telephone lines. Or we might purchase a tiny computer chip that has all the audio information already imprinted on it.

"I'm really excited about the possibilities of the digital disk. But we

. . . *continued overleaf* —

— the author —

Neil Brody is an independent engineer/producer whose career has spanned over 11 years in the recording industry. Formerly a disk-mastering engineer with United Artists Records, he went on to become chief engineer at the Village Recorder in West Los Angeles, before turning independent in 1977. His recording and mixing credits include Neil Diamond, Carly Simon, The Band, Devo, The Jacksons, Helen Reddy, and many others. Brody is also the recipient of two RIAA Gold and two Platinum albums, as well as an Ampex Gold Reel Award.

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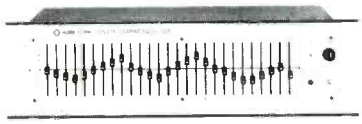

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face basically the same problems of standardization that the videodisk is facing now, and it will take some time to work that out. It seems that it will be solved in time, although I still think the analog disk is a tremendous storage medium, and that its universality and compatibility are a big plus."

As John Golden from Kdisc see it, we need to be cautious about dismissing analog completely:"The analog disk is obviously on its way out, but not as fast, perhaps, as some people think. Keep in mind that there are still a lot of countries in the world that haven't yet advanced to electronic phonographs; they're still using manual windups. They have a long way to go no matter where *we* are.

According to The JVC Cutting Center's Larry Boden, "It'll take the analog disk until the end of the century to really die out. I'm looking forward to digital disks, and I think that they'll be a big improvement over what we have now."

Wally Traugott of Capitol Records forsees that, "eventually things are going to change. The disk as we know it might be on its way out, but to get everyone in the world to change their hardware over to laser systems is going to take a little while yet."

"People aren't content today with just sitting down and listening; they want to *see* it as well," offers Brian Gardner of Allen Zentz Mastering. "I would think in the next five to ten years we'll see a major turnover in the record business to include video, It would *have* to."

A point with which Terry Dunavan of Elektra Records *(picture unavailable)* agrees: "Videodisk is probably where the industry is headed. The price of a videodisk will prove to be very competitive with a record — maybe six dollars or so more."

The Superiority of Digital

While all the mastering engineers to whom we talked acknowledged the inevitable prominence that digital sound will play in the audio future, many of them expressed certain reservations about its suitability and value at its current stage of development.

"One of these days," Ken Perry says, "digital is going to get sorted out. The areas that need working on are increasing the sampling rate, and filter design. I hear a ringing and definite 'graininess' on the top end, caused I'm sure by the filters. One of digital's great advantages is that when cutting disks from digital material, even after repeated playbacks, you get absolutely no degeneration of the master tape.

"If you have many sets of parts to cut, like we did with Bruce Springsteen's *The River* album — 326 sides one-at-a-time — you can cut part after part with no degradation or wear. Analog tape would have worn out after about 50 sides."

Economic as well as aesthetic factors appear to play an important role in digital's overall acceptance.

"The digital systems that I've worked with have had a lot of breakdowns," recalls Bob Ludwig. "We have had such severe dropouts, after playing the tape so many times, that the system could not recover from them. We had to recreate new master tapes from the original mix masters in order to continue. Consequently, digital has cost the studio thousands of dollars in downtime that we could not bill to the client."

As for the aesthetics of digital sound, Ludwig says, "Sometimes digital can sound larger than life; even more detailed than what you sent to it. I don't like the top-end response compared to analog, especially on complex waveforms like brass. Strings seem to have a harsh sound... the difference between a Stradivarius violin and a regular violin in real life is not much more than phase differences and upper harmonics — it's pretty subtle. I'd be curious to know if a digital recorder would show those differences."

Adds fellow New Yorker George Marino: "expense can be a real problem with digital. Our experience, and those we talked to using it in the studio, is that there's been a tremendous problem with downtime as opposed to analog. If a machine goes down during a session — mixing or otherwise — you could lose a spontaneous performance, and it can ruin the whole attitude.

"As far as straight-ahead quality of quietness, frequency response and transient response, digital seems to surpass analog. It must, of course, be mixed and recorded properly. But there is a coloring difference in the top-end of digital that sounds somewhat artificial. It might even be that it's more *correct* than what we are accustomed to hearing."

Digital convert Larry Boden says that he prefers digital to analog: "Certain systems have problems with dropouts, etc., and it's our policy that when you cut with any digital system other than JVC — because we feel that ours does not exhibit those problems — you pay for all the lacquers that are blown due to a malfunction of digital tape or the machine. In order to cut two sides on one project here we blew 26 lacquers.

"As far as the complaint that many people have about the top-end of digital not going up as high as analog, that's true. You take a Studer A-80 or Ampex ATR-102 ½-inch and it'll record a lot higher than digital; there's no question about it. On some digital material you may hear the absence of anything above 22 kHz — overtones and rings that are important. I don't think that's much of a problem anymore, although it was when digital first came out. To be practical about this now, we're making records for *people*, not Doberman Pinschers!"

Doug Sax, however, admits to not being a digital advocate: "The more I work with it — and we've done several digital projects at The Mastering Lab — the less happy I am with it. Digital really loses low-level information, echo, and room ambience. It sounds typically 'harsh', and there's a lack of 'air', and 'dryness' to the sound. There's enormous phase shift from 1 kHz up in the top, and a ringing of the

Bill Lightner of Kdisc

DIGITAL DISK FORMATS

Currently, there are three digital disk systems and one digital "fixed card" system being developed, all of which are incompatible with one another. So far there has been no agreement as to the establishing of an industry "standard" between the competing companies; the ensuing battle will probably be decided by market forces.

The *Compact Disc* from Sony/Philips gives every appearance of emerging as the most popular digital format. The CD hardware comprises a 4¾-inch diameter 16-bit disk that is read by a laser optical pickup; it has a one-hour playing time; a signal-to-noise ratio, dynamic range and channel separation of more than 90 dB; and a frequency range of 20 Hz to 20 kHz. Physical wear over the lifetime of the disk is said to be immeasurable. The CD format is expected to be released to the Japanese marketplace as early as the Fall of 1982. At least 30 companies in the U.S., Japan and Europe have already been licensed for the production of CD audio disk players, and, according to Sony, a few hundred titles already have been made available for CD release.

Other formats vying for the digital home market are Telefunken/Teldec's *MiniDisk* (MD), which is digitally-encoded but not laser read; JVC's *Audio High Density Disk* (AHD) based on and compatible with the company's Video High Density Videodisk, and due to appear in the U.S. in mid-1982; and DRC-Soundstream's stereo digital player, which utilizes laser tracking to "read" digital information stored on a fixed card, rather than a rotating disk. □□□

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filters that doesn't exist with analog. Thirty IPS tapes at any good studio go out to 40 kHz. With digital, the top end runs into a stone wall at 22 kHz.

"Many of our customers came in with digital tapes, appreciated what it did, learned to not like what it didn't do, and have since gone back to analog. There's also an increasing faction in the audiophile consumer market that's not enamored with the sound of digital.

But Sax does concede that "the *Compact Digital* disk with all its faults will be more viable, more frightening, and more competitive than anything the analog disk has ever had to face in the last 30 years. The stiffest competition the analog disk faced in the past was the pre-recorded tape, and it has been equal to that task. Now, it's going to have to withstand a 90 dB system that is scratchless and noiseless, with a wide frequency range, and it's got to bite into analog's sales."

"If I could find a way to use digital for the bottom-end and analog for the top-end," says Terry Dunavan, "it would be the best overall sound possible. Digital is great on the bottom, but the top lacks 'luster' and 'air'. In order to get the top right on digital you have to EQ the high-end a lot."

Wally Traugott forsees digital really happening when manufacturers perfect and extend the high-frequency response of recorders: "On every digital tape I've ever done, I always want to add some 15 or 20 kHz equalization to give it some air. But the bottom-end response of digital is phenomenal. Recently, Capitol did a digital and simultaneous direct-to-disk of Doc Severensen, and the digital just didn't compare. It was clean and super quiet, but you don't have that airy feeling that makes it all seem live."

"Digital is very clean and transparent sounding — it's almost *too* clean," says John Golden. "The fact that we've always heard background noise in the past might be the reason that digital sounds somewhat unnatural to us now. I really think that digital is the inevitable recording medium of the future."

Bob Ludwig also has noticed a difference in the top- and bottom-end response with digital: "Bass frequencies are sampled some 400 times per waveform, whereas the high frequencies are only sampled once or twice per waveform. The bass resolution is incredible with digital, but the top end on good analog is wonderful.

"A lot of times when making two-to-two digital copies, I have the feeling that the copy sounds different, but I've never been able to pinpoint it. I think it's because of the error-correction schemes that are built in all the digital systems to handle dropouts. Of all the digital systems I've worked with, including Mitsubishi and Sony, I like the JVC best."

Larry Boden has also had good experience with the JVC system. "We copied an original digital tape for a client . . . then we copied the copy . . . then we copied that copy, and so on. We went 10 generations of copies, and the client couldn't tell the difference. It's an astonishing process, and ideal from a label or record buyer's standpoint to be able to send out absolutely perfect clones of everything, so that the tape in the U.S. is the same as in France, Austria, and Japan.

"Another advantage of digital is for those labels who have large analog tape libraries. They should look into transferring their analog tapes on to digital, because it doesn't disintegrate like analog. There are some wonderful old analog tapes where the oxide is literally falling right off."

And, just when you thought it might be safe to go digital, according to Bernie Grundman, "Digital sound is more *defined*, but more lifeless than analog. Analog has cleaner low-level information, echo and ambience. We've found as you go down generations with digital, it gets worse."

An Ideal Analog Format — Half-Inch Two-Track

Almost all the cutting engineers to whom we spoke were in agreement when asked which analog tape format they would recommend for optimum quality sound.

"Personally," says Capitol's Ken Perry, "I like half-inch two-track, 30 IPS, with no noise reduction. I've had several producers come in and do a reference disk from quarter-inch tape and a half-inch two-track, and then compared the two. Everyone that's done it has gone with the half-inch: It is quieter, more transparent, has more depth, and a bigger sound.

"While I'm very fond of the top-end you get with half-speed mastering, on just about every project I've heard cut that way I don't like the bottom-end. We do 90% rock and roll, and the bottom octave seems to recede with half-speed, plus I hear more wow and flutter. We are also so busy here I wouldn't want to do it anyway; our production time is too critical.

Bob Ludwig agrees: "For me, all things considered, half-inch two-track, 30 IPS, no noise reduction is the optimum quality. It gives an extremely smooth, extended, warm sounding top-end. The bass is adequately good, although not as spectacular as digital."

As for half-speed mastering, Ludwig claims that "clients who have had projects cut both ways are never so knocked out that they want to cut their next record half-speed. Also, you have to go to an equalizer that halves the RIAA and NAB curves, and you end up having to boost a lot of bass, which usually means ringing on the low-end. It's a trade off; the low-end punch is lacking, while the transient response is better. You also need half-speed cards for Dolby or dbx, and tape machines that normally roll off at 50 Hz are now rolling off at 100 Hz, and the program material suffers. I would only recommend half-speed cutting for material that is extremely high transient in nature, like percussion music with brake drums being hit by metal hammers — those kinds of transients."

Greg Fulginiti prefers 30 IPS, non-Dolby half-inch, two-track, "because it has more depth, more density, more 'dimensionality' . . . better low bottom- and top-end. I'm not into ½-speed cutting, considering the volume of work we do. It takes twice the time, and you have to listen to the program at half speed, equalizing with the octave difference. It's not appealing, even given the claims and supposed advantages."

Doug Sax also sees a trend towards half-inch two-track mastering,

"It's getting the very best out of analog," he offers. "As far as half-speed cutting is concerned, The Mastering Lab isn't doing any. To my ears half-speed is not producing a better product, and I have great qualms about it. There is a loss of bass solidity . . . a loss of 'punch'."

"We know that 30 IPS, non-Dolby half-inch two-track is quieter," says Bernie Grundman, "and it seems to have a little better low-bottom compared to, say, an Ampex ATR-100 quarter-inch, 30 IPS two-track tape.

"Half-speed has never been proven to me that it's better. Nowadays if you exceed the limitations of the cutting systems on the high-end, you're way beyond what you're able to play back later anyway. The play-back systems are still our biggest limitations, *not* the cutting systems."

Wally Traugott also considers half-inch to be the next step: "Time- and cost-wise the record companies are not that happy with half-speed cutting and, personally, I'm not really into it."

For George Marino, however, the choice of mastering format depends on the music: "For hard rock I'd recommend quarter-inch, 15 IPS CCIR, because it manages to keep things cleaner without sounding too 'pretty'. For something MOR, medium rock or country, I like half-inch two-track 30 IPS. Classical and jazz sound great on half-inch two-track or digital.

"Half-inch two-track 30 IPS seems to translate really well to disk; it's very smooth, open and quiet . . . it's very personal. Each different format gives a different flavor. It's an experimental thing that depends on the project, and what seems to work best in tune with what you want to do with the music.

"With half-speed the bass, which is generally good, is not as punchy as half-inch or digital, and the overall level is

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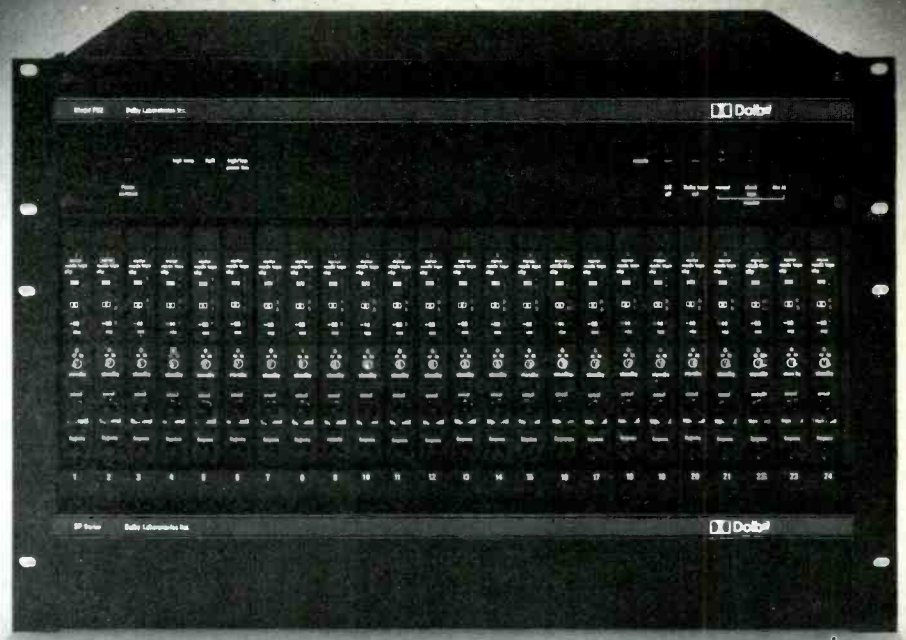

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generally lower than normal speed cutting. The biggest advantage I see to half-speed mastering is not so much the half-speed cutting, but that they're usually done as a special order, and are pressed on excellent vinyl with a lot of care. Those pressings are much better than the average pressing."

Larry Boden of JVC Cutting Center, a facility known for having done a great deal of half-speed disk mastering for the audiophile market, concedes that half-inch two-track has been a big improvement for the facility.

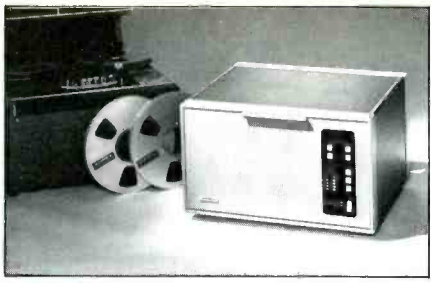
"As a matter of fact," he continues, "we're even doing half-speed half-inch mastering. Of all the analog formats half-inch is definitely the best way. There's better signal-to-noise, more life and more 'sock', because you can hit it harder. With half-speed you get wider separation, lower distortion, improved low-end and it's *quieter*.

"Although it may be quite costly to go half-speed, judging from our repeat business, there are a lot of people out there interested in it."

According to John Golden and Bill Lightner, "Half-inch two-track is a step between normal two-track and digital. The costs involved are considerably less; it's incredibly clean; and you can make all the edits you want. Plus it goes up all the way up above 20 kHz, and that means a lot. If you take that away you *really* notice the difference."

Terry Dunavan, however, isn't so convinced: "Half-inch two-track has a little better signal-to-noise ratio, but I don't know if a quarter-inch tape mixed well at 15 IPS Dolby or 30 IPS would sound significantly less."

HALF-INCH TWO-TRACK HARDWARE



Shown above are the three currently available half-inch, two-track mastering and disk-cutting reproducers: the* Ampex ATR-102 *(top left) with its companion ADD-1 digital delay unit; the* MCI JH-110M, *which incorporates delay/preview paths compatible with Neumann, Scully and Capps cutting systems; and the new* Studer A80VU, *which features upgraded, transformerless line output amplifiers.* Otari *is also reported to be contemplating release of a half-inch version of the MTR-10 transport, although the company plans to further explore the design of its present ¼-inch machine which, it is claimed, is capable of providing record and replay quality approaching that of a half-inch system. "Typical" performance specifications of half-inch mastering machines include better than 80 dB signal-to-noise ratio (reference: 510 nWb/m at 15 IPS), frequency response of 30 Hz to 24 kHz, +0.75 dB/-2 dB at 15 IPS, and overall distortion of less than 0.8% at 510 nWb/m flux level and 15 IPS speed.

After the Cut — The Pressing Plant

Many times even the best efforts of the artist, producer, recording and mixing engineer, and disk-mastering engineer can be negated by a poor plating or pressing job. Our mastering engineers were asked to comment on current-state-of-the-art in these critical stages of the record manufacturing process.

"There's a lot of frustration as a cutting engineer" Greg Fulginiti claims, "because you work so hard to get a certain tone to the instruments or the voice, and then when you get the pressing back seldom does it sounds quite the same as the reference disk.

"There is no consistency to really rely on in any pressing plant in this country. What might come out as a pretty good pressing today may not be the same tomorrow. The big problem with quality control is that when you have strict schedules and release dates to meet, and 'X' amount of presses on which to press the records, sometimes the cycle time on each piece of vinyl isn't as long as it could be to suppress some of the noise, non-fill and other areas you have to pay

particular attention to, in order to have a quiet pressing. Sometimes, if they can't get a quiet pressing, they wind up *wiping* the parts, which totally diminishes the top-end you wanted there in the first place."

As Larry Boden points out, "For many years there hasn't been a lot of money put into pressing plant facilities. As a result they've grown old, outdated and they haven't been able to attract the kind of employees who could give them good-quality records. I think that's changing now. I've gotten some awfully good store copies lately; when the company wants to do a good job of pressing, they can.

"The U.S. market presses so many more records compared to Germany, Japan or England, and the initial pressing on a major act is so large — and they have to be pressed so fast, due to tight release schedules — that it's hard to quality control all of them. It's different when you are pressing records for 10 million in England, as opposed to 220 million in America. We are our own worst enemy in that, if overseas plants had to meet our pressing orders, I don't think their quality control would be any better than ours."

On the subject of vinyl formulations, Terry Dunavan says that, "while the quality of vinyl has improved immensely in the last couple of years with the developement of Quiex 1 and 2 by Vitec, and KC600 by Keysor Corp. — which are both excellent — the better formulations are a little more expensive, and the rec generally don't want to 5 or 10 cents it costs to As a result, the ov pressings leaves mu there are so many weak chain at this point that it's disast

"There have been tremendous inroads made in high-speed cassette duplication lately, to the point where I would sometimes almost rather buy a cassette than a disk because of the problems inherent in disk manufacturing. To be honest, I haven't heard anything that is state-of-the-art today; I've seen some of the worst pressings on the floor ready to be shipped that I was literally ashamed of. Right now we are experiencing tremendous problems in the industry, one of which is lack of sales. I wonder if that isn't to some

The Analog Disk
Is There Life After Digital?

extent due to the poor quality of the records. I think we were making better records six years ago."

"The biggest problem we are having now," says Ken Perry, "is the pressing plant blowing parts for whatever reason. There is a lot of justification for people being unhappy with today's pressings. We try to get that last ounce of level or EQ, only to have it negated by a poor pressing job.

"Every once in a while though, things can come together just right. There are currently two places that are my favorites: Sheffield, and KM in Burbank, California. I'm spoiled with them because they are able to get what's on the lacquers on to the pressings. The Environmental Protection Agency has recently pulled three chemicals out of the PVC vinyl we use for pressings, claiming they are carcinogenic. One chemical was a lubricant that helped with ticks and pops, and improved wear. Europe still does not have that

NOISE REDUCED DISK FORMATS: CX and dbx RECORDS

The most recent disk-related developements intended to improve replay quality are the CBS CX and dbx noise-reduction systems. Both are currently being marketed as an attempt by the manufacturers to improve the signal-to-noise ratio of an analog disk, in hopes of competing with the future "noiseless" digital disk. Both systems require that the program be encoded on disk at the mastering stage, and later decoded by the consumer with the purchase of suitable add-on hardware.

dbx claims that some 110 encoded disk titles are currently available, with another 70 due by the Fall. Recently CBS has backed off its promise of "between 50 and 100 CX-encoded titles for the fall of 1981," as their software availability is reportedly behind schedule. WEA, RCA and Telefunken-Teldec have all agreed to release CX-encoded programs for the future, but to date no software has been made available by these companies.

The CX noise-reduction system has received considerable resistence from some artists, producers and engineers, who have questioned its merit. CBS recently announced that it would be delaying its promotional campaign for the CX system, but has promised a major consumer education campaign to come in the future. However, no formal time-table has been announced. Audio dealers are reportedly hesitant about promoting the CX system until more software becomes available.

Our team of disk mastering engineers were invited to comment on the merits of the two, basically similar, compansion systems.

Bernie Grundman: "I don't particularly like the CX unit. We had some first hand experience with it trying to master a Columbia project, and ended up going normally rather than CX, because of the difficulties CX brought to the disk. It's not a bad system as long as you have an encoder and a decoder. There is also a slight loss in quality just because of the additional electronics.

. . . *continued on next page* —

CBS CX Noise Reduction System — A Technical Description

by John Roberts, CBS Licensee

Signals from -40 dB to +12 dB (Re: 3.54 cm/sec reference level) are compressed 2:1 during disk mastering. Upon playback a complementary 1:2 expansion restores the full dynamic range of the original master. If this system sounds familiar it should; with a few exceptions it is identical to most tape noise reduction systems.

CBS is said to have chosen to limit the amount of compression to 26 dB for two reasons. First, the best master recording possible with present or foreseeable technology (digital included) does not excede the dynamic range of well-pressed conventional records by more than 20 dB. Secondly, a high-quality (dynamic) master can be compressed to such a degree, and still be listenable. To this end CBS has put a lot of effort into the system time constants, to reduce the audibility of gain riding when an encoded disk is not played back through a decoder (expander).

Obviously, the success of non-decoded listening depends upon very dynamic masters, and non-critical listeners, both of which seem to be missing from auditions to date. However, debate over how non-decoded CX sounds is missing the point; stand-alone decoders presently cost around $100, with the cost to the consumer coming down rapidly as the system is reduced to an integrated circuit, and built into equipment. There are no differences in manufacturing of the disks, and therefore the CX-encoded pressings are priced identical to normal pressings. To this end, CX offers a very economical system capable of delivering state-of-the-art performance with in-place production equipment, and minimum incremental cost to the end user.

The real challenge will be the creation of master recordings clean enough to take full advantage of CX's near 90 dB dynamic range. No longer will it be necessary to limit and compress during mastering (sweetening?); for better or worse the records can sound just like that final mixdown in Studio B.

An interesting side effect of this whole program will be the certain education of the consumer regarding what compression sounds like. That innocent little "in/out" switch on the CX box gives an instant comparison of dynamic to compressed music. A wider appreciation for dynamics may change broadcast practices, and maybe even production values.

Wide dynamic range does not automatically make a recording good or bad. The medium, however, should not be the limiting factor. The artist should have as clean a canvas to work with as possible. □□□

restriction, so their pressings tend to be quieter."

Bob Ludwig is somewhat pragmatic about the pressing problem: "State-of-the-art in analog disk cutting is really *way* beyond what you hear off your dealer's shelf. There are a great many forces at work in the commercial world of records that result in the analog disk suffering a great deal. It's not that the record companies don't have the technology to make a good record — they do. But they tend to be too cost conscious. They're worried, for instance, about short stamper life. Instead of getting maybe 800 or 900 high-quality disks out of a stamper, they push for 1,800 or so, lesser quality ones. They don't want to pay the extra bucks to make another stamper."

George Marino also sees pressings as a continuing problem of economics: "We could have a better quality of vinyl and show more overall care and quality control at the pressing plant. I see a great lack of communication between the plating, pressing, and quality-control departments. There are times when I'll get a test pressing and it will be *ridiculously* bad. Then, after a second, third or fourth test pressing they will finally get it right. With proper communications and quality control, the pressing should be right the first time, and from then on during production."

Says Wally Traugott: "I know record companies are capable of making a good pressing. I had a pressing done in Norway, and it was just like listening to the tape. There were no pops, ticks or noises . . . no Pacific Ocean on the lead-in groove — it was *super quiet*."

"The quality of pressings really seem to vary," claims Brian Gardner. "We go through periods where they are beautifully quiet; no problems. Then we go through some nightmares with noises, ticks and whatever."

. . . *continued overleaf* —

NOISE REDUCED DISK FORMATS: CX and dbx RECORDS

"CBS was planning to release a one-inventory compatible disk. It's a 2:1 compression-expansion system, which is why we ran into problems trying to make it a compatible disk. Without the decoder to play back through it pumps, and on anything with any quiet passages, it raises the level of them. Our biggest problem with the CX system was when the tune starts to fade out — it brings up all the noise, hiss and system noise by 15 dB, so the spreads sound like the ocean.

"Because of its 2:1 compression-expansion slope, if the disk playback system is up 1 dB at 100 Hz, when you play back this disk through the decoder it'll be up 2 dB; it doubles any errors. Also, the consumer will be getting a lot less than he planned for. If you put out a double inventory, CX is a great thing. But to try and force a single-inventory disk . . . I don't think it's feasible.

"If there's going to be a double inventory, they might as well go with the dbx. I was impressed when I heard it. You have to use a decoder with dbx because it really alters the signal; but it solves a lot of the problems we have with just the mechanics of disk cutting, whereas the CX doesn't. The CX system is a full-frequency response, level-dependent device. dbx alters the frequency response and, because it was built to overcome tape saturation with tape machines, when a high-frequency transient comes through, it takes it down, and expands it later when played back through the decoder. The disks are perfect right to the inside groove, because all those transients are held way under. You don't need as much space on the disk because dbx also rolls off the bottom end, and playback systems have an easier time of tracking it.

"The record companies are worried about digital disks, and they want to get a little more mileage out of their pressing plants and the analog record. So if they manufacture a noise-reduced record they can match the noise from digital disk. They claim to get 15 dB of noise reduction from it."

George Marino is equally unhappy with the system: "I don't see the CX working properly, and it's by no means compatible. We had a meeting at Sterling Sound with CBS, and we layed out a whole bunch of questions and apparent inconsistencies. They've never gotten back to us. Any noise reduction system would be ok if presented properly, but one encoded, single-inventory release as opposed to giving the consumer the option of a dual release is *ridiculous*. I'd rather see them charge another 10 or 25 cents a record, and make a record that will sound good. The companies claim that 'even if the kids don't have the decoder they won't be able to notice the difference.' But, if they don't hear the difference, why would they buy the decoders in the first place!

"Our policy at Sterling Sound regarding the CX system is: If a client and CBS both want to use it, we will, but we would always advise against it."

"I was once quoted in *Billboard*," states Bob Ludwig, "that if the CX system ever caught on, I was going to give up audio. It's true. I feel the dbx system is better, but even then when I listen at home I don't like noise-reduced disks at all, because they give me aural fatigue. They are trading off super quietness for music. I think there's a place for a noise-reduced disk, but for the average rock or classical record maybe 1% needs it, and the rest stand to lose more than they gain. To have CBS, Inc. say, 'Here's a CX disk; you're going to have to listen to it encoded until you buy a decoder' — which in my opinion doesn't decode a pressing too well — and to foist that on the public, is a travesty!

"I've heard a CX system hardwired from the output directly to the decoder, and the compander sounds quite good that way. Even the dbx compander sounds good that way. But once you use a pressing with all its low-frequency rumble and warp, and all the other

— *continued overleaf* . . .

What advice Gardner might give a producer or engineer to insure optimum quality of their pressings?

"Just be sure to follow through," he says. "Make sure you receive a test pressing, from all plants."

According to Bernie Grundman, "It seems like the exception rather than the rule that you get a good clean pressing; they are so inconsistent. Technically, pressing plants are capable of doing a better job than they were five years ago, what with the improvement of some plating facilities, such as Sheffield and Europa, and the improved quality of vinyl that's been developed recently by Vitec and Keysor."

And a final point on pressing quality from Doug Sax: "The general overall quality if definitely better than it was two years ago, with the improvement of the quality of the vinyl compounds. CBS's pressing plants are consistently making the best mass-produced records around. There are many other encouraging signs for the future with WEA [Warner-Elektra-Atlantic], the largest record company in the world, purchasing the Allied pressing and Speciality Records pressing plants back East, along with the Sheffield matrixing facilities. They are currently setting all of this up in order to manufacture their own records and, from what I've heard, it's going to be quite impressive."

The Role of the Cutting Engineer

While many members of our team of mastering engineers often agreed on specific aspects of disk cutting, every cutter and mastering room facility represents a unique philosophy and approach to its craft. The panel was asked to describe their own philosophy, how they saw their role as disk mastering engineers, and how they thought it might differ from their competitors.

Greg Fulginiti: "Disk mastering is the last possible place to add something unique to something that is unique to begin with. I approach each genre of music individually, and try to breathe an additional aspect of life into it that doesn't diminish what an artist, producer and engineer has already achieved.

"If you put 10 records on the turntable, I could tell which cutting rooms probably cut them. I think there's a 'Bernie Grundman' sound, a 'Doug Sax' sound, and so on.

"Equipment is only part of it. You could pick up the mechanics of what I do in a couple of days. More important is the individual who's cutting the record, and the knowledge one has of the refinement of the art . . . although often the determining factor is what satifies the client, because this is a service business. Even if you don't necessarily agree musically or artistically, you want to keep the client happy — there is a lot of compromise."

Bernie Grundman: "We approach the tape in one way — our primary concern is *clarity;* to be able to 'see' in and hear the mix, because we know things get a little more muffled when they're pressed. You'd think that would be any disk cutter's objective, but I hear a lot of dull disks. The Westrex cutting system we have at A&M produces a very accurate and aggressive sound. For the pop market it seems to do very well, at least the way we have it set up. A lot of the components are hand-built here, like sibilance correction circuits, that don't interfere with the signal as much as some of the others on the market. Things like that add up to a little better signal on the disk."

Wally Traugott, explaining his philosophy: "Disk mastering requires your getting involved with each project, and hearing a marked improvement in the sound quality. When not afforded the luxury of a remix, due to record company deadlines, many times saving the project is possible in the mastering room. In most cases, I would like to think that the mastering process is the icing on the cake."

Bob Ludwig: "Disk mastering is the final creative step, and the first manufacturing step, in the record chain. We can make amazing differences in the way it sounds, and *then* we proceed to cut the first matrix from which all the others are made. My philosophy is to do as little to the program as possible, so long as it's musical; do whatever it needs, but don't do more. I'm the happiest when I've got a console filled with outboard equipment and I'm using none of it, because it sounds better without anything."

Doug Sax: "You don't want to put anything in the mastering chain that you don't have to, including amplifiers, transformers or anything else that isn't

continued . . .

NOISE REDUCED DISK FORMATS: CX and dbx RECORDS

unintended information now interacting with the program material, and then put it through a cartridge that must be aligned — because, unlike the dbx system, CX is level-dependent — that's going to change things.

"I did some computer analysis of the CX system based on Eric Small's 'Modulation Analysis,' a software program applicable for any sound source. When I ran the CX material through the program, I confirmed statistically what I had heard with my ears. It seems the more compressed and contrived the original program is, the less the CX interferes with it. Highly-compressed rock sounds almost identical, but classical — the very material that stands to benefit the most — suffers the worst."

According to Terry Dunavan, who attended demonstrations of the CX unit at the AES Convention, Motown and Warner Brothers, "the basic idea to eliminate record noise is a good one. I just think that the CX system falls short of what the producer, the engineer, the artist, and the public want to hear. The unit itself can be heard in its encoded and decoded forms. It has its own sound, much like a limiter or compressor or an equalizer — I hear it pumping and expanding. You have to use it with extreme care. If more expertise, time and care were taken in the pressing process, we'd all have the records we're looking for *without* CX."

"I hear a definite change in tonal quality with CX that I don't like," says Greg Fulginiti. "The material seems compressed, and the 'patina' finish you once had or strived for is now gone. If you play back without decoding, it sounds harsh and metallic, and not at all musical. The situation is delicate. CBS, for me, has been a very good client and if they want to use it, I'll do it. But, on the other hand, my artistic feeling is that I don't like the unit in any way, shape or form at all."

Larry Boden doesn't think that a CX-encoded record without decoding is in any way compatible: "As far as I know, they consulted none of the experts in modern circuit design, and people I've talked to that have seen the schematics of the system think that it is slightly behind the times. I don't like it, but if it becomes the standard, of course we'll use it. I just wish that they had consulted with us first; they could have gotten some good input from the field. I'm wondering how it's going to broadcast. Are they going to issue CX-encoded records for broadcast? That's another big problem."

As Doug Sax points out, "Noise becomes horrible in the quiet sections when you play back a CX record without a decoder. It has a transient lag even with the decoder. It wheezes and honks . . . it's not an honest product to sell. The only moral way to get this product on the market is to have a dual release: one CX-encoded, and one normal. CBS refuses to do both, and they only want to release the CX version. They've had enormous resistance from producers and artists, and have backed down to the point where they're saying if the *artist* wants to use it, then they'll use it. They want the manufacturers to build CX decoder units into their receivers."

"There is some coloration there even after decoding with the CX unit," John Golden says. "We did a CX-encoded disk at Kdisc Mastering for a CBS artist after already having cut and approved normal master lacquers. It was somewhat of an MOR-type record with a lot of quiet passages, and, based on the fact it would make a good CX demonstration record, CBS decided to go with it. The artist, the producer and the engineer weren't too pleased, but at that point they had no alternative."

During the preparation of this article, CBS Laboratory was contacted twice for their viewpoint but, unfortunately, it failed to return our calls. □□□

absolutely necessary. If the tape is good, you try to leave it alone. We've been set up as a transformerless transfer chain since we opened The Mastering Lab, and we only go through additional electronics if you want to alter the tape with EQ or whatever. Basically we've set it up so that you can cut a lacquer going from the tape playback right into the cutting amplifiers, and completely bypass the console."

George Marino: "I think of myself as the producer's tool; pretty much the same as the engineer in the studio. I will try and hold the identity of the group, rather than impose my sound on them. If it sounds *right* on disk, I don't care what the EQ on the console says. By equalizing in a certain fashion you can make a better mechanical product, rather than a flat disk, because you are giving something the consumer can reproduce more accurately at home."

John Golden: "Our room is transformerless from the preview head to the cutter head. As far as I'm concerned, your equipment and maintenance must be good, but the ultimate bottom line is the *operator*. Mastering is a very intricate and active part of the phonograph record process. Unfortunately, the mastering engineer is not recognized as such. But if you cut the same tape flat at five different mastering rooms, you'd end up with five *different* lacquers."

Ken Perry: "I think a lot of my job in the cutting room is correcting for monitor problems. If an engineer mixes with very bright monitors and is unfamiliar with the studio, he might bring in a dull tape.

"Tapes are getting better and better all the time, and the type of thing we're doing is touching up. I think that most of us who are successful in this business are musicians, or former musicians. If you don't know what the instruments or ensemble sound like, you're going to miss the boat a little bit."

Terry Dunavan: "A disk cutter's job is to take the product that the producer, engineer and artist has worked very hard to attain, and to transfer it as exactly as possible, using whatever appropriate modern conveniences and technical abilities at his disposal."

Brian Gardner: "The less you have to do to the record at the mastering stage, the better. But if it needs any EQ or compression, etc., by all means do it. We try and make the record sound as natural and as clear as possible. For our playback machine, we use a Telefunken M-15A, and we feel it has a superior sound. We are always acutely aware of the technical aspects of disk mastering, but we also focus on the *feel* of the music, rather than just turning knobs.

"The capabilities of today's cutting systems can far exceed what you're later able to track. There's a certain raunchy sound to the records of the Fifties and Sixties that you don't easily find today, and I wonder if we're not getting a little too sophisticated."

Boden's Undertaker Analogy

Larry Boden: "Mastering engineers are the undertakers of the record industy. When someone dies, the undertaker puts him in a suit, puts some make-up on him, and people come by and say, 'Oh, doesn't Harry look great . . . he didn't look that great when he was alive.' Now if Harry were in an accident before he died, the undertaker's job would be much more difficult.

"We get a tape once all the damage has been done: there may be distortion, print-through, high-end splatter, sibilance — all the problems. It's up to us — the undertakers of the record business — to put it in a suit, put some make-up on it, so when people listen to the record at home they say, 'Hey, doesn't that record sound *great*'."

* * *

As may have been gathered already from the various, often conflicting, opinions expressed in this article, there are indeed many ways to cut a master lacquer disk. Disk mastering is a technical process in which many subjective value judgements and other considerations must be made before the finished lacquer can be sent to be processed and mass produced for the public's consumption. As with any art form, there are no absolutes. □□□

A Practical Approach To

Electronics · Troubleshooting · Maintenance

THE PRE-DISTORTION PHENOMENON

— a Linearization Circuit
— a Distortion Analyzer

by ETHAN WINER
The Recording Center
Norwalk, Connecticut

No sane recording engineer would ever add distortion to a program *intentionally* — unless, of course, the goal was to increase headroom and lower tape distortion. No, I'm not talking about a new type of "sonic exciter," but a well-known and accepted method of counteracting the onset of saturation in magnetic recording tape. Unlike amplifiers or other electronic circuits, for which the clipping threshold is well defined, analog tape distortion creeps up slowly, minimizing dynamic range in exchange for clear transients. By using a tape linearizer — a circuit included in recorders by such manufacturers as Scully and MCI — it is possible to reduce the distortion in the range above 0 VU, while raising the level at which third-harmonic distortion(THD) reaches 3%.

Although the actual pre-distortion circuit to be described is extremely simple (Figure 1) and only requires one trimmer adjustment, you'll still need some accurate means of measuring THD in order to achieve the best results. In the October issue of *R-e/p*, a phase-shift circuit was shown that could cancel a given frequency, by mixing its input and output together in a console. This is certainly a valid approach, although any distortion or noise in the console will affect the measured results. For truly accurate readings, a better means of mixing is required; as a result, I actually sat down and built a dedicated distortion analyzer to aid in evaluating the linearizer circuit.

To my surprise, this device has turned out to be one of the most useful little gadgets I have, and I would not hesitate to call the circuit lab-quality, with perhaps one trade-off for its simplicity and incredibly low price — that is, switched rather than tuned frequencies. However, since most oscillators can be set to produce any audible frequency, this is a relatively minor limitation. For example, on the prototype I built the 1 kHz position turned out to be around 960 Hz, and the 10 kHz setting was more like 9.7 kHz. But, as I said, who cares?

Pre-Distortion — What It Is

When a sine wave — or music for that matter — is recorded on audio tape at high levels, the tops and bottoms of the signal are compressed or clipped off as the magnetic material approaches saturation. The pre-distortion scheme allows for a slight increase in gain at the very extremes of the waveform, which will "over-drive" the tape just enough to offset the flattening that would occur normally. This non-linear amplification, by itself, produces a distortion that is similar, though opposite, to that of the tape; hence the term "pre-distortion."

The circuit of Figure 1 will provide this required increase in gain as the signal reaches a certain level, dependent upon the setting of the 10 kohm trimmer. Normally, the gain of an op-amp is determined by the ratio of the resistances in the feedback voltage divider. But, in this circuit, the diodes become active as the voltage across them reaches 1.2 volts, effectively lowering the resistance of the 10 kohm trimpot on signal peaks. Separate diodes are required for each polarity to create a symmetrical response, since tape distortion occurs at both the positive and negative extremes.

If you aren't afraid of modifying your recorder (and you shouldn't be), an even simpler implementation may be used, requiring only two diodes, the trimmer, and an electrolytic capacitor. Figure 2 shows a typical record output stage (as found, for example in Ampex and MCI machines), while Figure 3 illustrates the addition of the pre-distortion components. All that's required is to replace the emitter resistor of the bottom transistor with a trim-pot of similar value, and add a capacitor and the diodes as shown. Because the signal voltage at this point in the circuit is relatively small, only one pair of diodes will be required. These should be germanium types, such as the 1N34 or 1N270, since their reduced turn-on threshold more closely coincides with these low levels. Other recorders, such as ReVox and Scully models, employ a single output transistor. The emitter resistor still controls the gain, however,

Figure 1

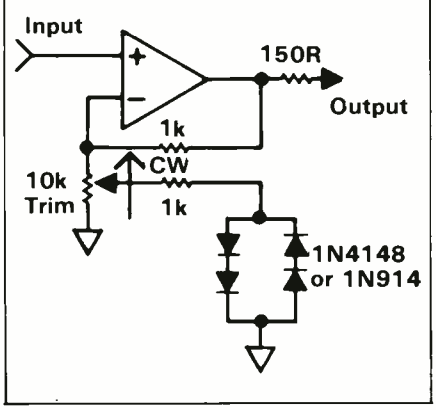
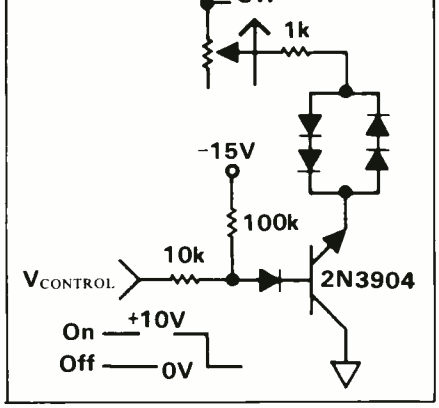


Figure 1A



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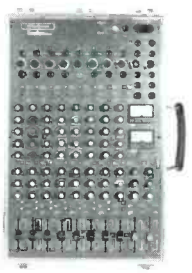

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PRE-DISTORTION PHENOMENON

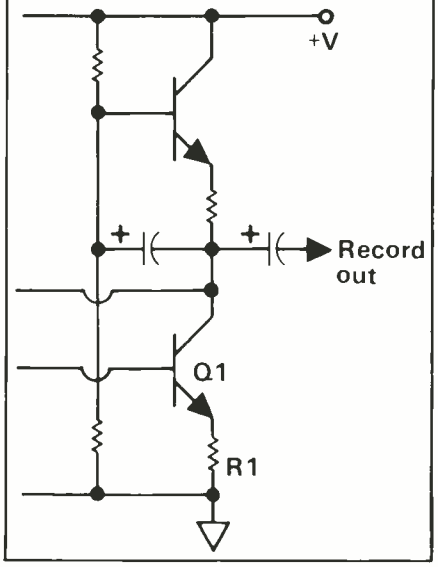
— a Linearization Circuit
— a Distortion Analyzer

and the modification will be the same. In the unlikely event that you encounter a PNP transistor, you should reverse the polarity of the capacitor.

The is no reason to believe that this method would not improve the performance of a cassette deck as well, although I suspect that the optimum place to tap into the circuit would be *after* the pre-emphasis networks. The biggest appeal for pre-distortion, no doubt, will be for use at 30 IPS without noise reduction, since every clean dB you can squeeze on to the tape is important.

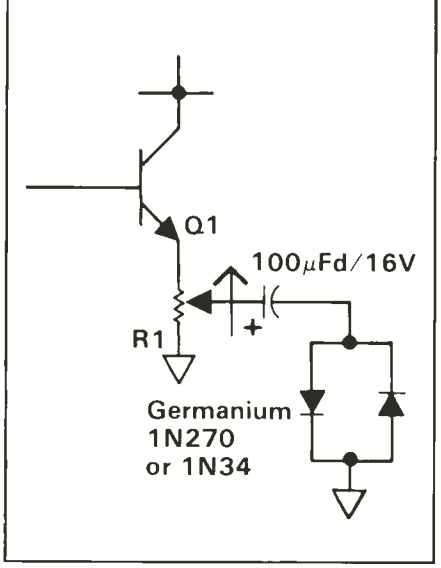
If you elect to use the op-amp circuit of Figure 1, rather than modify the record electronics of your machine, you may want to include provisions for switching out the distortion circuit, since it will affect the audio quality when monitoring through the recorder's input. This can be done either with a switch that disconnects the diodes from ground, or you could use a transistor as shown in Figure 1A, which would allow automatic operation via the record relay, or the controlling of many channels from one switch. This is purely optional, of course, and very well may not be worth the trouble.

Figure 2



At first glance, the switching transistor may appear to be connected backwards, but definitely this is not a mistake. While it's true that the gain of a transistor is very low with collector and emitter transposed, this is better for switching audio, since the diodes will be brought much closer to ground. If 10 volts is inconvenient as a control, any other voltage can be accommodated by changing the 10 kohm resistor up or down, maintaining about 1 kohm for each volt of input. Also, a PNP transistor should be used if the control voltage will be negative.

Figure 3



It is also possible to use this circuit to provide *post*-distortion on playback to improve tapes that were recorded too hot. A few years ago, a cassette manufacturer introduced a model with this feature, although I imagine that proper adjustment would be pretty tough. Speaking of adjustment, it is imperative to have some means of measuring THD for this project to be a success, which brings us to the next part of this article.

The Distortion Analyzer

At the heart of any THD meter is a notch filter for removing the original test frequency (See: *R-e/p*, October 1981 issue; page 124). After filtering, it is an easy task to measure the harmonics and noise that remain, and relate them to the total signal as a percentage. It is also very desirable to have an oscilloscope connected to the notch-filter output, which will enable you to observe the nature of the distortion. Listening to the output of the filter can be very enlightening too, and is highly recommended.

During the course of testing the pre-distortion unit on my Otari MX-5050B recorder, I measured nearly 1% distortion *through the electronics only* when the input level reached +10 dBV. By having a 'scope connected, I could easily see that this was mostly second harmonic, which I later pinned down to the output transformers. (More about this later.) Of course, the tape distortion at this level was almost 3% but, being mostly third harmonic, it would not necessarily mask the recorder's distortion. With the linearizer circuit connected and adjusted for the best results, I was able to reduce the 3% figure to nearly 1% using Ampex 456 Grand Master tape. (By the way, I

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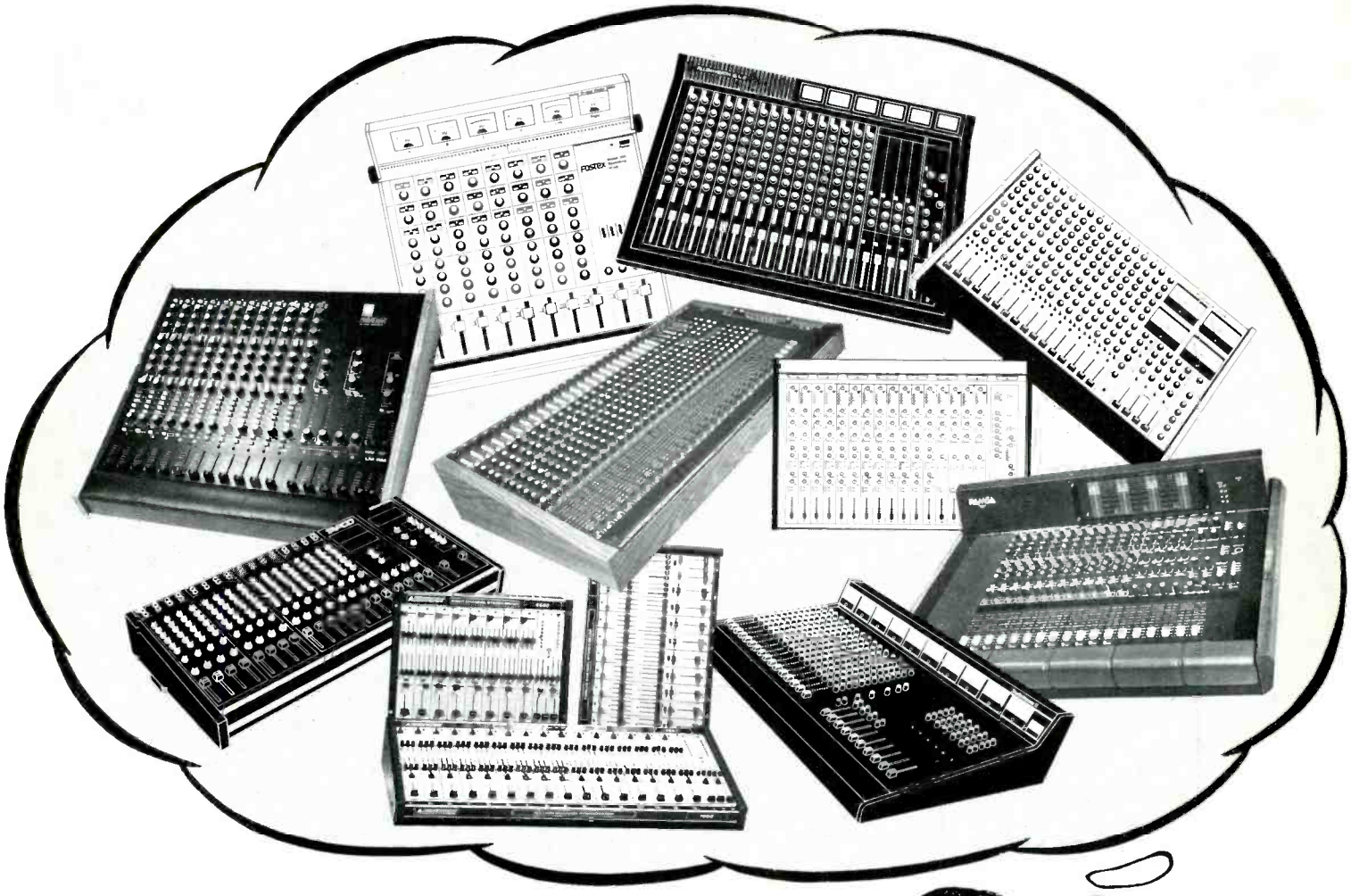

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PRE-DISTORTION PHENOMENON

— *a Linearization Circuit* — *a Distortion Analyzer*

should mention that 0 VU on my Otari corresponds to 200 nW/m flux level.)

When measuring distortion, it is important to start with a clean test signal. Most function generators won't do, even if a sinewave output is provided. One percent THD is typical for these units, although this could be reduced to 0.1% by applying 20 dB of peak boost with an equalizer. This procedure will be most effective at low and middle frequencies; and shelving off the high-end at an appropriate point might further reduce the distortion figure. I use a Heathkit Model IG-18, which is a bridged-T, RC oscillator, and only has about 0.1% distortion to begin with. Routing *this* output through a parametric equalizer then gives me a really clean signal for my tests.

But, to get back to the analyzer, Figure 4 shows its schematic, and the accompanying photograph illustrates how easy the construction can be, especially if you use a quad op-amp like the TL074. In fact, building the analyzer was no problem at all; it's the pots and switches, the drilling and labelling, and constructing a power supply — now *that's* a pain! Another headache can be trying to locate high-quality ICs and other components. I have had consistently bad luck with most mail order semiconductors (especially PolyPaks), and even paying prime prices at Radio Shack doesn't always guarantee you prime-quality ICs. And if you call a legitimate parts distributor with an order for say, one IC, you'll probably be laughed at — that is before they hang up on you.

Currently, I buy all my ICs from Phoenix Systems (91 Elm Street, Manchester, CT 06040), because they only stock "the good stuff," and test each piece before it goes out the door. (Believe me, I know.) Also available from Phoenix is a low-cost, bi-polar power supply kit that can save you a lot of trouble. Again, I'm not here to plug any particular dealer; it's just that these kits use high-quality transformers that don't get hot or buzz loudly like many that are available.

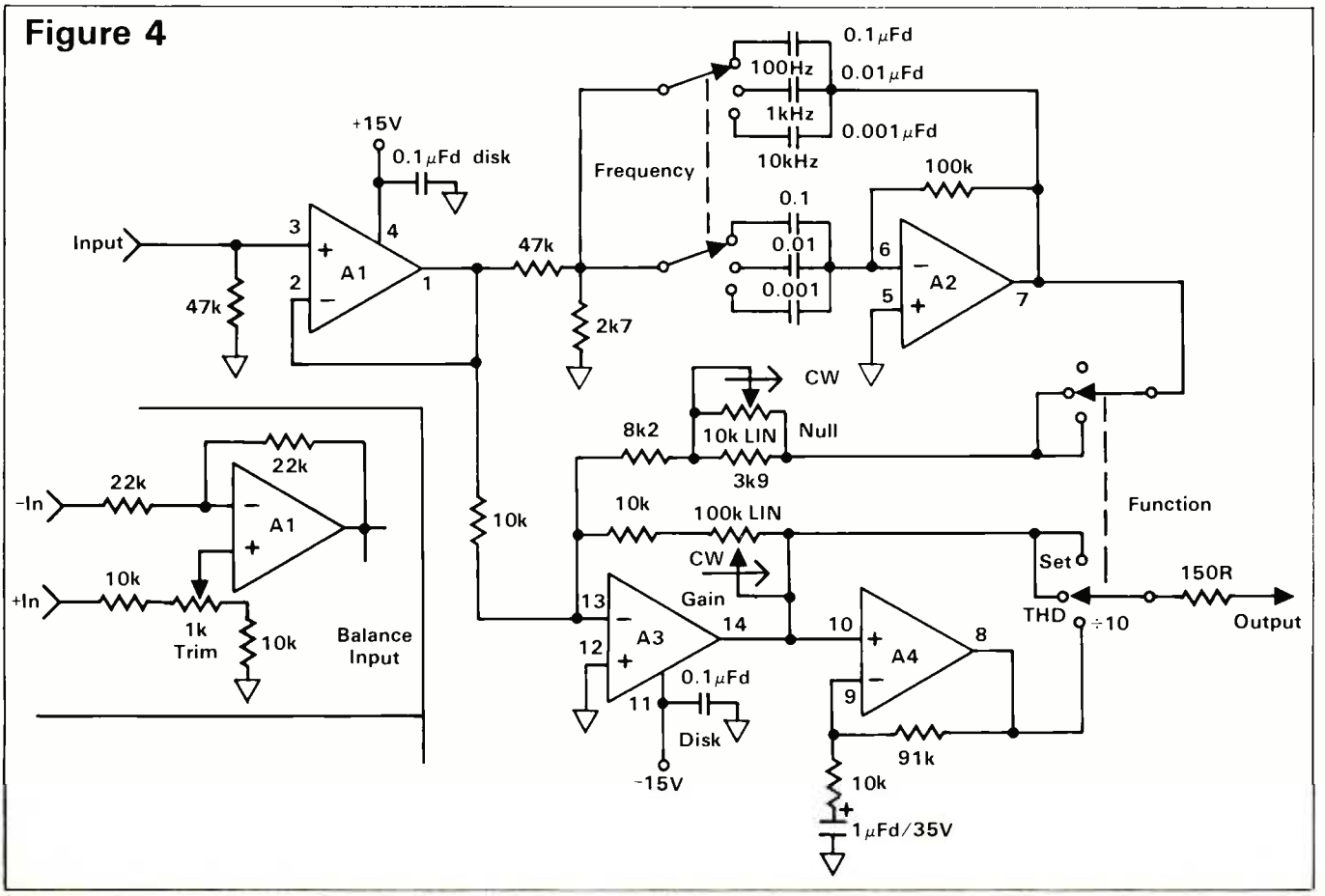
If, like me, you build a lot of little gadgets in metal boxes, you can save the expense and trouble of constructing a separate power supply for each by using a stereo phone jack as a power connector. This way, one or two supplies could power many different projects, and such a technique also allows some distance to be placed between sensitive circuits and a power transformer's hum field.

Now, to *really* get back to the analyzer, by referring to Figure 4 we can begin our look at circuit operation with input buffer A1. This op-amp has a gain of unity, and is used solely to isolate the active filter from the outside world. If a balanced input is needed, use the alternate version shown in the inset. The 1 kohm trimmer is used to adjust common-mode rejection, although it may be easier to simply use precision resistors instead. A2 is configured as an active bandpass filter whose frequency is determined by the switch-selected capacitors. This filter has a bandwidth Q of 3, and produces a notch when its input and output are summed together at A3.

You can choose any audio frequency you like by scaling the capacitors up or down, using the given values as a guide. For example: selecting a value of 0.5 nF — or 500 pF — will yield a 20 kHz filter; while 0.2 uF will tune it to 50 Hz. The capacitors should be high-quality Mylar or mica types, since the more common disk is quite temperature sensitive. Adjustment for THD measurement is very delicate, and even a tiny amount of frequency drift will be a real handicap. For this same reason, the null potentiometer should be a 10-turn wirewound device if possible, or you should at least use a large knob to help increase resolution.

The actual frequency cancellation occurs at the inverting input of A3 when the function switch is set to "THD." The gain control is used to set the full scale to 100%, and A4 provides an additional 20 dB of gain for measuring very low distortion levels. When used with a meter that can measure in millivolts, this circuit will allow readings below

Figure 4



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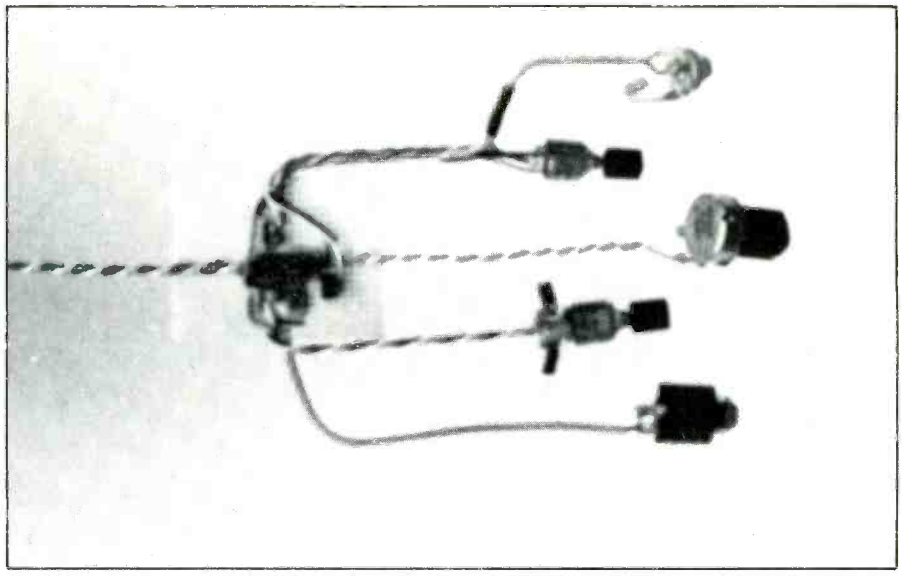
— a Distortion Analyzer

0.01% with confidence. Be sure to use a TL074 quad op-amp as shown, however, and not the lower cost TL084, since the latter's higher noise level may limit the minimum obtainable reading.

Ground loops are another important consideration whenever small signals are involved, since any hum or high-frequency noise on the ground wires will show up on the meter as distortion. This is another reason for either using a scope or audible monitoring of the output while doing distortion testing.

One way of ensuring that the analyzer itself has no internal grounding problems is to bring the input, output, and power grounds together at only one point on the circuit board. Toward this end, an insulated jack (for example, Switchcraft N-112A) is used for the input connector to prevent the metal case from bridging the jack grounds. One final note on the circuit: if you are a real stickler for accuracy, you will want to trim the gain of A4 to be exactly 20 dB, since this amplifier stage is in the measurement path. You can do this either with a trim-pot, or by selecting and matching resistors.



Detail of Distortion Analyzer construction —

Set-Up and Use

Once you've completed building the unit, plug it in, turn it on, and pray that it doesn't blow up! If it passes the smoke test, take a voltmeter and check each op-amp's output pin — these are conveniently located in the corners of the IC. The DC voltage should be within a few millivolts of ground; if this is not the case, check your wiring and/or try another IC. Once you successfully get this far, you're ready to begin measuring distortion. The first thing to measure should be your sinewave oscillator, so connect it to the analyzer's input.

Start with the frequency set to 1 kHz, the null pot in the middle, and place the gain control at minimum. Adjust the oscillator to some reasonable output level, and increase the gain control until the analyzer's output reaches 10 volts on an AC meter. (I should mention that most digital multi-meters do not have good response beyond a few kHz, so an analog meter will be a better choice here. Also, since the test procedure involves nulling, a mechanical meter will be much easier to interpret.)

With the full-scale set at 10 volts, switch the function selector to "THD," and alternately adjust the null pot and the oscillator's frequency to obtain the minimum reading possible. Now select "Divide By 10" switch setting, and continue tweaking until you are satisfied that you have completely cancelled the 1 kHz fundamental. You are now reading distortion directly in percent — that is, 10 volts equals 10%, 0.1 volt equals 0.1%, and so on. You will probably find, as I did, that due to the capacitors' tolerances, 1 kHz will not be precisely 1,000 Hz. Again, it doesn't really matter, but you should make note of the actual frequency to save time in the future. Try the same thing at 100 Hz and at 10 kHz (or whatever you choose), and by the time you're done you'll be an old pro.

Measuring distortion while the tape is running follows the same basic procedure, although two new factors may have to be dealt with. First of all, any wow or flutter in the recorder will modulate the test frequency and, if severe enough, can make nulling impossible. This shouldn't really be a concern with professional equipment, however, so we can move right along to the next problem.

One of the most powerful uses for a distortion analyzer is as an aid for

optimizing tape bias. The reader is directed to a wonderful article in the October, 1978, issue of *R-e/p* ("Your Studio Mastering Tape"), in which authors Ball and Dahl illustrate that the best bias point for Ampex 456 or 3M 250 is when the third harmonic distortion is at a minimum. The only problem with trying to measure this is that as the bias is increased, the overall output level from the tape decreases, along with the harmonic components. One could easily be seduced into thinking that distortion is at a minimum when, in fact, the actual value in percent may be relatively high.

If you have a dual-trace oscilloscope, this will be no problem at all — simply view the analyzer's input and output simultaneously with the patterns superimposed. As the level goes up and down with variations in bias, both patterns will grow and shrink, and it will be easy to visualize the ratio between them.

Another method would be to feed the output of the recorder into a *low-distortion* limiter before routing it to the analyzer. Use a moderate to slow release time, and just enough limiting to hold the level constant. It would probably be a good idea to try this first without the recorder, just to be sure that your limiter is up to it. By the way, these tests should be done with 1 kHz, and at a level near 0 VU. Once the bias has been correctly adjusted, the next step will be to add pre-distortion.

With the linearizer circuit in place, and the 10 kohm trim-pot at minimum, begin recording a 1 kHz tone while monitoring off the tape. Increase the input level until the measured distortion reaches 3%, and then slowly advance the trimmer. The distortion reading will begin to dip as the diodes become engaged, and it will be obvious when you have found the optimum setting. That's all there is to it, although this adjustment should be checked from time to time, along with the usual alignment procedure.

Honesty compels me to point out that the one important difference between this distortion meter and a "real" one — besides tunability — is the lack of automatic nulling. Although earlier units by Hewlett-Packard and other manufacturers were very similar to ours, all of the current models are capable of adjusting themselves for the most complete cancellation. Of course, this doesn't improve the overall accuracy very much, but if your idea of a good time is to sit around and measure distortion all day, it will certainly make life easier. Oh well, you get what you pay for.

I know it may seem a little late to be jumping on the "transformerless" wagon, but two recent experiences have really brought this home. Earlier, I mentioned tracking down 1% THD to the transformers in my Otari and, in fact, when I bypassed them the distortion at +12 dBm dropped from

PRE-DISTORTION PHENOMENON

— a Linearization Circuit
— a Distortion Analyzer

1.1% to 0.13% — a nearly 10-fold improvement. The overall output level dropped by several dB, although to me this is of no real consequence. This was one of the easiest modifications I've ever done, since the transformers are mounted on their own little circuit board, right next to the output connectors. You can cut and splice the connecting wires to bypass the board, while paying attention to the plus and minus signs that are indicated, to preserve signal polarity. I only wish the next problem was so easy.

Not long ago, I had the opportunity to compare a new, state-of-the-art transformerless mike pre-amp side by side with the transformer inputs in my console. The difference was nothing less than remarkable, and I was determined to find out why. Long a skeptic of vague claims such as "increases transparency," or "recovers hidden ambiance" and, of course, my favorite — "based on psycho-acoustic research" — I have always believed that there is a valid reason for everything. That is, electronically speaking of course.

The first test I tried was low-level frequency response through the transformer input. Not too bad so far: down 0.5 dB at 20 kHz, but still respectable enough. Of course, music does not consist solely of sine waves, so the next test was with square waves, since this is at least a little closer. The steep slopes are rich in harmonics, and its repetitive nature makes viewing on an oscilloscope a lot easier than music. At 1 kHz, the 'scope trace looked nearly ideal, with only a slight rounding of the corners, corresponding to the high-end roll off. At 10 kHz things were still looking good, although the rounding was becoming more pronounced. At 30 kHz, the whole picture changed as the rounded edges became contorted trapezoids reminiscent of slew-rate limiting. Clearly, this was a problem, since cymbals, bells, etc., often produce substantial energy at frequencies beyond 20 kHz.

Although simple harmonic distortion might not seem to be a big deal way up there, audible intermodulation products can be created. A few years back, I connected my tube U-47 to an H-P spectrum analyzer, and was astonished to see a *straight line* to its 50 kHz measurement limit as I jiggled my keyring in front of the capsule. I mean, that stuff is there, and a good mike will pick it up.

However, this is not really intended to be an indictment of all audio transformers, and I would be unfair not to point out a few significant facts. First, all transformers are not this bad, and in fact I chuckle as I look back on my own naivete, since those transformers were quite expensive. Oh well, I guess you *don't* always get what you pay for after all! Second, it is not uncommon to find a transformer included within the feedback loop of an amplifier, thereby overcoming much of its inherent distortion. And finally, the 'scope photos that I've seen in ads for Jensen transformers are truly outstanding, implying far superior performance to my thumb-size imports. Needless to say, I am currently hard at work on a new input stage for my console, and will report my findings in the near future. □□□

Recommended Reading

How to Select and Treat a Mate — Your Studio Mastering Tape, by J. Talmage Ball and W. Jeffry Dahl; *R-e/p*, October, 1978.

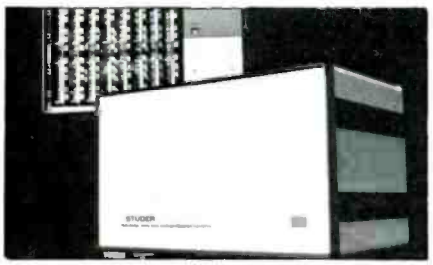
Audio From the Magnetic Recorder's Point of View, by David R. McClurg, *R-e/p*, October, 1976.

Performance Limits in Contemporary Console Design, by John Roberts; *R-e/p*, April, 1980.

Acknowledgement

Once again, I'd like to thank Bill Eppler for making me sound intelligent.

Digital Update



STUDER DEVELOPS UNIVERSAL DIGITAL AUDIO CONVERTER

Based on novel techniques in digital filtering and signal processing, the SFC-16 universal, purely digital sampling frequency converter makes it possible to transfer digital audio programs between recorders and other systems with conflicting sampling frequencies. The converter accepts arbitrary sampling frequencies from 30 to 56+ kHz. As it operates strictly under control of the clock signals, it does not require any programming.

The two-channel version fits easily into a 19-inch rack or cabinet of 11-inch height. Its applications range from format conversion to mastering for the Digital Audio Disc, and digital transmission of audio programs.

Simultaneously, Studer ReVox has called for a worldwide agreement in professional digital audio, based on the requirements of the recording and broadcasting industries. It proposes an agreement based on 32 kHz for the digital transmission of broadcasting programs, 44.1 kHz for Digital Audio Disc production, and 48 kHz for digital recording and compatibility with digital video.

3M ANNOUNCES SUPPORT OF 48 KHZ DIGITAL SAMPLING FREQUENCY

In the interest of a universally-acceptable professional digital audio standard, 3M is to support the 48 kHz sampling rate currently being proposed within technical audio, video and broadcast study groups. Robert Youngquist, corporate scientist for 3M's digital audio and representative in numerous standards discussions, continues to believe 50 kHz is better for purely technical reasons, however.

"The rate, selected almost a decade ago and incorporated in some 60 recorders worldwide during the past two and a half years, has some advantages over 48 kHz, particularly as it relates to video. Some users, in fact, may elect to continue using 50 kHz indefinitely," says Youngquist. "But, we concede that 48 kHz is very workable and presents no real sacrifice in audio quality, our principal concern."

According to Clark Duffey, market development manager for the digital equipment, 3M has been as anxious as anyone to see a professional digital signal standard achieved. 3M has tried to establish 50 kHz, also adopted and used by Soundstream, and distributed technical information to promote signal compatibility among potential digital manufacturers over a year ago. 3M now believes, however, that 48 kHz has sufficient acceptance by both user and technical study groups as a compromise to all the frequency rates being used or proposed. 3M hope that by taking this position, the other manufacturers will also help to establish 48 kHz as the professional standard.

"Fortunately," says Duffey, "our equipment is designed so that a studio can selectively achieve 48 kHz sampling rate merely by offsetting the tape speed to 43.2 IPS via the machine's variable speed function. Existing tapes would simply be played back at the original speed. When 48 kHz is adopted, a system modification will be developed as a future option."

DIGITAL RECORDING'S SUCCESSFUL TEST OF FIXED-DISK SYSTEM

The company's prototype uses a low power laser beam to scan a fixed film-like record. The laser beam, as modulated according to the digital code on the record, is converted into electronic impulses, and then into an audio signal that is said to reproduce the recorded sound far more accurately than existing analog sound systems.

Digital Recording Corporation's use of a fixed record — rather than a spinning disk as in other digital systems — is said to permit the use of a sealed tamper-proof scanning mechanism, and will provide quick and simple manual record changing. In addition, the format will facilitate incorporation of mechanical record changers, and allow for more efficient use of record material.

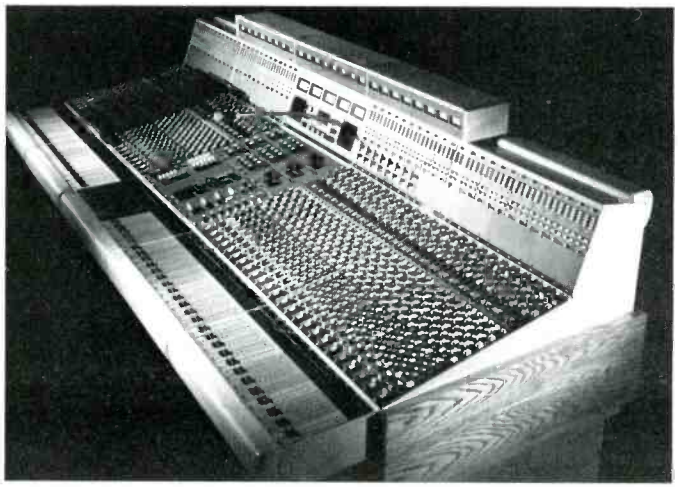
KQED-FM RECEIVES ARMSTRONG AWARD FOR DIGITAL BROADCASTS

San Francisco's National Public Radio affiliate KQED-FM has received this year's coveted Major Armstrong Award for technical achievement in broadcasting following its pioneering work with digital audio during the 1981 season. For all tape-delayed broadcasts of live performances by the San Francisco Opera and the San Jose Symphony, the station broadcast digital recordings made with the Sony PCM-100 digital processor.

The first U.S. digital concert season was aired locally as well as broadcast nationally over the NPR satellite network. Fred Krock, the station's chief engineer, cited the Sony Digital system as "100 percent reliable." KQED-FM plans to double the number of digital concerts in the upcoming season, and will be joining KQED-TV for digital audio simulcasts.

At Soundworks digital audio/video facilities, New York City, owner Charles Benanty (center), discusses the Donald Fagan/Steely Dan digital album with engineers Roger Nichols (left) and Jerry Garszva. The album is being recorded on the studios newly acquired 3M 32-track digital audio recorder, and will be released in mid-1982 on the Warner Brothers label.

New Products



NEVE INTRODUCES FOUR NEW CONSOLES RANGES, INCLUDING ALL-DIGITAL MIXER

Making the recent announcement, the company claims to be accomplishing two main objectives. Firstly, with three new analog mixers, Neve is re-affirming its commitment and faith in the future of analog consoles, which will predominate "at least as far ahead as we can foresee," according to Derek Tilsley, managing director of Neve Electronics International, Ltd. Simultaneously, Neve is ushering in the beginning of the new digital console era, which will undoubtedly play an increasingly important role in both music recording and broadcast in the future.

The three analog mixing boards comprise the 8128 Multitrack Music Recording Console, the 51 Series Radio and TV Production Consoles, and the 5322 On-Air Consoles.

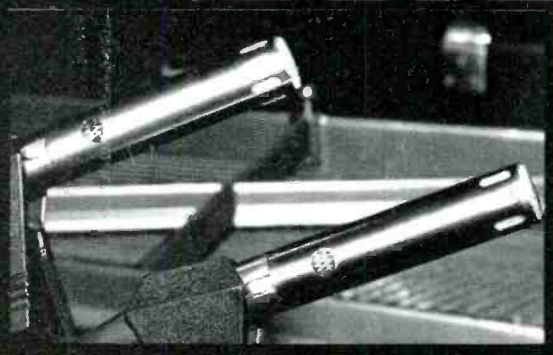
The 8128 Multitrack Console utilizes "Formant Spectrum Equalization" — the name Neve uses to describe its equalizer characteristics, and which has earned it a reputation for having, according to the manufacturer, the most musically-related equalizers available. Formant spectrum equalization is the result of years of development in close cooperation with key users, a development that has been concerned much more with the *sound* of the equalizer, than with measured parameters. The 8128 console can be supplied available with VCA systems, or either Necam 1 or Necam 2 automation.

The production consoles comprises three models: the 5104 four mixing bus, two output mixer from 12 to 48 inputs, with a choice of simple or comprehensive facilities; the 5106, an eight bus, four output mixer, with up to eight of the channels available for use as fully equipped and equalized groups; and the 5116 which adds the facility of 24-track monitoring and metering with comprehensive overdub facilities. The Model 5116 is designed for the growing number of radio and television production studios requiring comprehensive multitrack facilities, but where a conventional multitrack recording console is inappropriate because it would lack the facilities or the layout design for radio and television production.

The DSP Digital Signal Processing Consoles is designed to provide the ultimate in modern control systems. The control console is totally remote from the signal processing equipment and offers CCR — *Complete Control Reset* — full control assignability, and what is described as the most comprehensive automation yet offered to the industry, involving memory of *all* control functions. The control system will be offered in both standard and custom configurations. Because the control system is totally remote from the processing electronics it lends itself to economic customising to individual users preferences.

All signal processing on the DSP console is carried out entirely digitally. The system can receive and output analog signals, and a studio need not know operationally that the signal processing is carried out in the digita-domain. (In the same way that many analog studios today use digital delay lines, echo devices, etc.) These mixers will operate analog-in and digital-out to feed digital multitrack machines. It will also operate digital-to-digital for mix-down between

THIS MAN PRODUCES GOLD RECORDS



Plug them in, place them and compare. You'll HEAR a new transparency and clarity. You'll experience the NEW State of the Art.

Natural Sound, that's what I like, and the Wright Microphone gives me exactly the sound I want to hear. I like them so much I bought two SR-1 microphones to use on all of my recording sessions. Simply put, "The Wright Microphone is the Right Microphone for the job."

Larry Blackmon
Producer,
Cameo, Mantra, L.A. Connection

WRIGHT MICROPHONES • 2093 FAULKNER ROAD, N.E. • ATLANTA, GA. • (404) 321-3886

For additional information circle # 69

multitrack and digital master tape recorders.

Following technical discussions between Neve and Studer, it has been agreed that signal interfaces between the DSP System and Studer digital tape machines will be guaranteed. Versions of the new mixer are also available for disk mastering applications using digital delay to achieve the advance signal required for analog cutting lathes.

The British Broadcasting Corporation has declared its intention to order a 48-channel Digital DSP Console system for delivery in 1982, after forthcoming operation assessment of a prototype system in the BBC's Maida Vale Studios. The BBC propose to use the console in a digitally equipped outside broadcast vehicle, to be used for a wide variety of program applications. The vehicle will contain two ¼-inch fixed head digital tape machines, and will have provision for a digital multitrack machine.

RUPERT NEVE, INC.
BERKSHIRE INDUSTRIAL PARK
BETHEL, CT 06801
(203) 744-6230

For additional information circle # 70

MARSHALL ELECTRONICS UNVEILS AR-300 TAPE ELIMINATOR

According to Marshall, a large percentage of the recording industry's "golden ears" have expressed a strong desire for a delay device to replace tape, without introducing the "harshness" and "coldness" that digital delay lines exhibit. The company has found the "digital sound" unacceptable for a house delay for these reasons, and also because of the disasterous things that happen when clipping occurs.

The AR-300 Tape Eliminator was developed to take you backwards from today's DDL sound to the "old days" of the softer, warmer tape-delay sound; to eliminate such tape machines and their mechanical problems; and to offer state-of-the-art performance and convenience. The new unit is said to have been designed by special commission to A&R Studios, New York.

A great deal of time and design effort went into analysing what characteristics of tape appealed to the ear, and why. Marshall discovered that the emulation of desirable characteristics cannot be simulated by schemes such as level-dependent, high-frequency equalization, elaborate compression, and non-linear gain staging. A new medium was developed, wherein the delay elements themselves produce those desirable characteristics naturally, just like tape.

The AR-300 will duplicate all popular inter-head delays at three "speeds" of 7½, 15 and 30 IPS (a 20 to 300 millisecond range). In addition, the unit features a very wide VSO range, complete with tracking, bias and EQ compensation; each VSO range also overlaps into the next tape speed.

Other features include 103 +dB dynamic range at any delay setting; 20 Hz to 15 kHz response, without LF rolloff at high tape speed; balanced input and output capable of driving 600-ohm reactive loads to +18 dBm levels; "NAB" internal record/replay curves to provide tape-like saturation; provision for over-biasing the unit, just like tape; internal trims for even- or odd-harmonic content at saturation; separate EQ for each tape speed; and an inability to clip — increased levels just produce a "fatter" and "softer" sound, Marshall claims.

MARSHALL ELECTRONICS
1205 YORK ROAD
LUTHERVILLE, MD 21093
(301) 484-2220

For additional information circle # 72

DOLBY INTRODUCES NEW MULTITRACK NOISE REDUCTION UNIT

The SP Series provides up to 24 tracks of Dolby A-type noise reduction in only 12¼ inches of rack space, including separate power supply. In addition to being more compact, the SP Series has a number of control and performance refinements over the well-known Dolby MH Series, which the new series supercedes.

The new units provide the Dolby A-type noise reduction characteristic through the use of standard Dolby Cat. No. 22 modules. However, the SP Series is otherwise an all-new design that can contain as many as 24 noise reduction tracks across its standard 19-inch rack width. It features a separate regulated power supply with electronically-controlled output protection, and twin, low-noise fans to assure cool, reliable operation of the entire unit.

Functionally, one of its new features is an LED display for each track which permits accurate Dolby level calibration (within ±0.1 dB if desired) by matching the intensity of LED pairs. Additional LED's indicate the presence of signals and clipping, and assist alignment with high-level reference tapes.

A further refinement in the new Dolby SP series is the ease with which it can be recalibrated for playback and punch-in of nonstandard-level tapes. Once the usual calibration with the studio's recorder and tape formulation has been accomplished, those settings need not be disturbed when tapes from other sources are played. Instead, for each track there is a convenient front-panel "Uncal" knob,

which the user pulls out to bypass the standard preset calibration, and then adjusts to recalibrate for the particular tape being played. Pushing the knob back in immediately restores the track to the standard, preset studio calibration.

DOLBY LABORATORIES
731 SANSOME STREET
SAN FRANCISCO, CA 94111
(415) 392-0300

For additional information circle # 73

AMPEX UNVEILS ATR-800 MASTERING MACHINE

The ATR-800 is designed for the recording studio, radio and television broadcaster who want a recorder to meet their immediate as well as future requirements. The system can easily be converted from one to two to four channels.

"Combining an array of sophisticated operation and editing features, the ATR-800 gives the recording professional a high performance tool," says Chuck Coovert, Ampex general manager audio products group, "This recorder complements our successful ATR Series in operation around the world."

A cue amplifier has been built into the ATR-800 to permit monitoring of a single or multiple channels of the tape during editing, or while it is being cued. The transport also features hands-on-reel plus tape dump modes for manual editing convenience, and is equipped with a variable shuttle control to regulate speed and direction to make editing simpler. Standard on the ATR-800 is the single-point search-to-cue, with which the recorder will automatically return to a designated cue or edit point. By touching a single button, segments can be rehearsed repeatedly from the original starting point. Also standard is the Pick Up Record Capability (PURC), which allows editing or dubbing of new material without creating errors at either end of the new insert on the tape.

The ATR-800 has a new quick change head assembly of metal laminate construction to guarantee long life and high performance. The head assembly can be installed with a one-quarter-turn fastener. The recorder has been designed to accommodate a fourth head for playback of two different tape formats, without requiring a head assembly change.

Closed-loop DC servoed transport design maintains constant tape tension in all operating modes. Variable-speed operation permits recording and playback up to ±10% of nominal speed to correct recordings made off speed or for special effects.

Interchangeable control panels are unique to the ATR-800. The transport control panel can be mounted on either the left or right side of the recorder, to accommodate left or right-handed editing operations. A tape marker and cutter options designed to mark and cut edits is available for the first time from Ampex in the ATR-800. It allows direct marking and cutting of the tape at the push of a button.

Price of the basic two-channel recorder is $5,450.

AMPEX CORPORATION
401 BROADWAY
REDWOOD CITY, CA 94063
(415) 367-4151

For additional information circle # 74

MODEL 151 DELAY SYSTEM II FROM MXR

Representing the "next generation of digital time delay," the Delay System II uses MXR's advanced data conversion techniques to make a significant price-performance breakthrough in high-quality audio systems. In addition, greater time delays are available at wider bandwidths — up to 3.2 seconds — with the plug-in memory option (1.6 seconds standard).

ay System II provides a luding flanging, chorus, Doppler shifting, doubling, hard reverb and echo. A four-digit display indicates the actual time delay being used, while LED's indicate the bandwidth of the system at each delay setting. Front panel LED's also indicate the optimum operating level, delay bypass and repeat-hold.

The Delay System II's expanded memory capabilities allow for a wide variety of exciting echo effects. Up to 800 milliseconds at a true 16-kHz bandwidth, 1.6 seconds at an 8 kHz bandwidth and 3.2 seconds at a 4 kHz bandwidth, enables the user to capture entire musical phrases and play them back indefinitely with the repeat-hold feature. Effects that formerly required tape loops can now be cleanly and effortlessly reproduced in real time, MXR claims.

MXR INNOVATIONS, INC.
740 DRIVING PARK AVENUE
ROCHESTER, NY 14613
(716) 254-2910

For additional information circle # 76

MODEL 160X COMPRESSOR/LIMITER INTRODUCED BY dbx

A new generation of the well-known Model 160 compressor/limiter features switchable Over Easy® and hard-knee operation, regardless of compression ratio selected. Model 160X also features an exclusive precision dual-display system with an expanded range for continuous monitoring of gain reduction, as well as input or output levels. The latest unit incorporates Infinity+™ compression to provide negative gain control for "dynamic reversal" effects. Two Model 160X's can be strapped for dual-channel tracking compression, with switchable slave/master modes.

A dual, true RMS display system comprises a 19-LED display that monitors input or output signal level over a 60 dB range, and a 12-LED display to indicate the amount of gain reduction over a 40 dB range.

Additional features include both input and output connectors via convenient tip/ring/sleeve phone jacks, as well as a barrier strip connector for economy, reliability and ease of use. The 160X's continuously variable compression ratio from 1:1 to infinity:1 to -1:1 provides selection of the precise ratio needed for any situation. An independently accessible detector input allows compression pre-emphasis or de-emphasis, anticipated compression, and other effects.

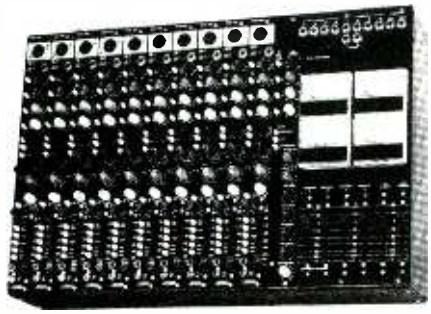
dbx, INC.
71 CHAPEL STREET
NEWTON, MA 02195
(617) 964-3210

For additional information circle # 77

MODEL 400B CONCERT-SOUND MIXER FROM INTERFACE ELECTRONICS

The Model 400B is described as high-performance compact mixer in which Interface Electronics has added features and reduced costs without compromising its standard fully modular plug-in construction, or its high standard of components. This versatile mixer is designed for long life under heavy usage but, should it require service, an exchange of a module with the factory or dealer is all that is needed.

Primary use of this mixer will be in sound systems, where it makes four mono submixes each of which can be panned into the two main stereo outputs. Slider masters are provided for submixes and main outputs. The four cue/effects sends can be used for special effects, cueing, or stage monitoring. Operator's stereo monitor listens to the main output, or to the cue mixes, or to any input solo. The mixer also lends itself well to stage monitoring, to recording up to eight tracks, and to mixdown to stereo or mono, and many other purposes.



The Model 400B assembly is modular and sectional: the basic unit holds 10 inputs (but can be ordered with less), and each added section holds 15 more inputs. Modules have four cue/effects sends each with pre/post slider switch, three equalizers with boost or cut capability of 15 dB, including a wide range tuneable mid-frequency equalizer that can be set at any frequency from 200 Hz to 20 kHz, plus sharp low and high frequency cutoffs.

Balanced, low impedance transformerless mike and bridging line inputs are provided through connectors on the panel, and a mike/line switch, followed by two pads, variable pre-amplifier gain, phantom power, phase reverse, solo, and module on/off. LED indicator warns of preamp overload danger. Four VU meters can be switched to read submixes, cues, or output and monitor.

List price for the basic 10-input model is $3,500.00.

INTERFACE ELECTRONICS
6710 ALDER
HOUSTON, TX 77081
(713) 660-0100

For additional information circle # 78

SYMETRIX 501 PEAK-RMS COMPRESSOR/LIMITER

According to the manufacturer, the 501 is an advanced technology dynamic range processor that combines the features of both a fast-responding peak limiter; and an RMS compressor in one compact package.

In addition to the use of a proprietary RMS converter, Symetrix has employed the latest EGC-101 VCA from Valley People. The use of the EGC-101 in the 501 makes possible broadband distortion specifications of less than 0.015% THD (at any output level), and noise figures of better than -88.5 dBU.

Another important feature of the Symetrix 501 is the "soft knee" threshold characteristic of

both the peak and RMS sections. The soft knee, according to the manufacturer, permits the transfer from a linear operating region, into compression or limiting, with virtually none of the objectionable threshold characteristics of conventional "hard knee" limiters.

Also incorporated is a "feed-forward" side-chain. Feed-forward design, as opposed to traditional feedback techniques, permits compression ratios of up to infinity, while at the same time maintaining freedom from distortion and modulation effects.

Manufacturers suggested retail price: $425.00.

SYMETRIX
109 BELL STREET
SEATTLE, WA 98121
(206) 624-5012

For additional information circle # 80

NEUTRIK CONNECTORS NOW AVAILABLE IN 25-PACKS

Available through all AKG microphone dealers as well as all Neutrik dealers, the 25-Pack program consists of 25 of one type of XLR-type connector packaged in this new affordable size.

Four connector types are available: three-pin male and female cable connectors, Models 3MC and 3FC respectively; and three-pin male and female panel connectors, Models 3MP and 3FP respectively. Additionally, these connectors are available in 25-Packs with all nickel finish housings, or all-black chrome housings. Contact pins are silver plated.

NEUTRIK PRODUCTS
77 SELLECK STREET
STAMFORD, CT 06902
(203) 348-2121

JBL ANNOUNCES 4345 AND 4355 FOUR-WAY STUDIO MONITORS

Incorporating new low frequency drivers for extended bass response and JBL's exclusive High Resolution Dividing Networks for increased transient capability, the new units replace, respectively, the 4343 and 4350 systems. The improved 4345 and 4355 are said to be ideally suited for large scale studio installation where extremely high sound pressure levels are required.

Engineered for either full-range or bi-amplified operation, the 4345 is designed in pairs with mirror-image driver configuration for precise stereo imaging. The 4355 is specifically designed for bi-amplification, and includes two low-frequency loudspeakers driven independently of the system's other components, thus further reducing distortion at high volume levels. Smooth reproduction from 32 Hz to 20 kHz is offered by the 4345, while the 4355 operates at a wider range from 28 Hz to 20 kHz.

Both the 4345 and 4355 feature a new High Resolution Dividing Network for optimum smooth transition between frequencies. Capable of functioning continuously at high power levels, the network contains controls for mid-, high-, and ultra-high frequency bands. An additional electronic crossover device, such as JBL's 5234A, is necessary to effect transitions for the 4355's two low frequency drivers.

Improved components in the 4345 include a larger (18-inch) low-frequency loudspeaker, the recently introduced model 2245H, with a 4-inch diameter voice coil and 20-pound magnetic assembly. JBL's exclusive Symmetrical Field Geometry (SFG) design is incorporated into the magnet for significantly reduced second-harmonic distortion.

Offering many of the same improvements as the 4345, the new model 4355 features two new 15-inch low-frequency loudspeakers mounted in a ported enclosure. The two drivers allow twice the power input to the system's low frequency section, resulting in a 3 dB increase in acoustic output.

JAMES B. LANSING SOUND, INC.
8500 BALBOA BOULEVARD
NORTHRIDGE, CA 91329
(213) 893-8411

For additional information circle # 81

LEXICON SUPER PRIME TIME PROGRAMMABLE AUDIO PROCESSOR

Model 97 Super Prime Time™ allows the user to create, store in memory and recall the desired effects in any sequence at the push of a button. The system stores eight factory preset programs and 32 user-created programs of

effects in internal non-volatile memory. It also allows convenient off-loading of user programs to ordinary audio cassettes or tape storage, allowing an unlimited library of program effects to be stored off-line.

Frequency response is a quoted 20 Hz to 20 kHz at all delay settings up to 1.92 seconds, 0.03% distortion, and 90 dB dynamic range. The eight built-in effects include flanging, resonant flanging, doubling, tripling, chorusing, slap echo, short echo, and long echo. Audio engineers and producers can use the off-line tape storage to save and, if desired, keep confidential their repertoire of audio enhancements and effects. Since such programs can be re-loaded into any Super Prime Time at the push of a button, engineers and producers can work with their own library of effects at any studio or facility equipped with Super Prime Time.

A novel proprietary feature, *Dynamic Recirculation Control*, makes it possible to achieve long delay time feedback effects without undesirable "layering" or overlap with the next input signal. Dual VCO outputs permit modulation of a second delay line with the Super Prime Time, or cross coupling of two systems for stereo effects.

LEXICON, INC.
60 TURNER STREET
WALTHAM, MA 02154
(617) 891-6790

For additional information circle # 83

GAUSS INTRODUCES NEW LINE OF STUDIO MONITORS

The studio monitors, the first ever introduced by Cetec Gauss, are available in two models: the 7480, designed as a high-end prestige unit with superb sound characteristics; and the 7350, intended as a more popular type unit with excellent sound characteristics and size.

Model 7480 utilizes an 18-inch woofer in a 12.5 cubic-foot enclosure to provide full 20 Hz to 20 kHz power response, and a large compression driver (model 4081), which has inherently lower distortion than smaller drivers. A fourth-order network in a specially tailored crossover is used to minimize frequency dependent radiation pattern tilt due to non-coincident drivers. Also, components are aligned to minimize time delay and phasing.

Model 7350 utilizes a 15-inch woofer in a 6 cubic-foot enclosure to provide full 35 Hz to 17.5 kHz power response, and a compression driver (model 2080) with constant directivity horn. Unconventional crossover frequencies of 200 Hz and 1.6 kHz are used to take advantage of fundamental music frequencies from one speaker for smoother, easier listening sound.

In addition, both models are bi-amped systems using 4-ohm, low-frequency woofers to take maximum advantage of output available from the current solid state power amplifiers.

"The Gauss monitors are designed to provide systems to meet demands of critical listening for recording studios and other playback applications," said Mort Fujii, company president. "The objective is for smooth, clean and natural listening sound without the mechanical transducer sound prevalent in many systems."

CETEC CORPORATION
9130 GLENOAKS BOULEVARD
SUN VALLEY, CA 91352
(213) 875-1900

For additional information circle # 84

SOUND WORKSHOP UNVEILS LOW-COST DISKMIX AUTOMATION PACKAGE

The Diskmix system will interface with existing automation systems, such that the only connections needed will be accomplished via a patch bay interface. This will enable easier installation; no authorization needed from the suppliers of existing system hardware; simple confirmation of malfunctions in either system; no need for modification or reprogramming of existing system; and normal operation assured should Diskmix malfunction.

Diskmix will operate initially with the Sound Workshop ARMS and MCI JH-50 systems, although the package will interface with the Valley People 65K System (which encompasses the majority of all other console systems) soon after market introduction.

The system is computer-based, thereby allowing system updates to occur during development, as well as after introduction. To ensure ease of program upgrade, the entire operating system will reside on disk, and be downloaded into RAM during system initialization.

Introduction of Diskmix is said to be premised on several major points:

- An increase in artistic control during the musical creative process
- Useful "bells and whistles" so that the studio owner may better market the services of the studio against the competition
- Compatibility between console systems, providing producers/engineers with freedom of choice of mixing environments. A tape mixed on a Harrison/65K system, for example, may be moved to and mixed at a studio with MCI or Sound Workshop systems, thereby ensuring full compatibility between automation systems.

Many mixes may be stored on disk (actual quantity is dependent on mix activity), and can be combined, off-line, such that a new mix can be created on disk without destroying the original mixes. Basic operation will require *no* engineer intervention; simply roll tape and Diskmix will store it. There is no need to mix full passes, and updates can be typed in through the keyboard.

Mixes are linked back to the multitrack master tape in real time via SMPTE time code, which is used in instructing all partial mix functions. In addition, Real Time functions will be provided, and time ranges will be optionally stored by a label. In addition, current automation data on the multitrack tape will be convertible to Diskmix-type storage on disk; disk backup (safety) facilities will be provided.

The Diskmix System comprises a Processor PCB, housing a SMPTE generator/reader and necessary interfaces; intelligent dual-disk 8-inch drive; power supply assembly; and intelligent keyboard computer capable of providing color graphics

Professional price of the new Diskmix System is $18,500; delivery is projected for February 1982 (March for 65K version).

SOUND WORKSHOP
1324 MOTOR PARKWAY
HAUPPAUGE, NY 11788
(516) 582-6210

For additional information circle # 86

PHASE LINEAR INTRODUCES MODEL A15 POWER AMPLIFIER WITH LIMITER

The Model A15 single-rackspace amplifier is rated conservatively at 65 watts RMS per channel into 8 ohms, and 100 watts RMS per channel into 4 ohms. As with all Phase Linear Professional Series products, the A15 is said to offer audiophile-quality sonic performance in a rugged, flexible design ideally suited to a variety of fixed installation and touring applications.

The unit is equipped with two separate precision variable slope limiters for 15 dB of overload protection beyond the rated power output level — equivalent to over 2,000 watts per channel of clipping headroom. As a result, the A15 can be utilized to power a compression driver in a bi-amped system, with no danger of clipping or voice coil damage. In addition, the unit's exclusive control circuitry is so configured as to make the limiter completely error-free.

Housed in its compact, 1¾-inch high chassis, the amplifier is a modular, fully complementary device. Functional features include LED Fault, Signal Present and Thermal indicators; balanced/unbalanced inputs; and automatic mono input. Total harmonic distortion is quoted at less than 0.05% from 20 Hz to 20 kHz.

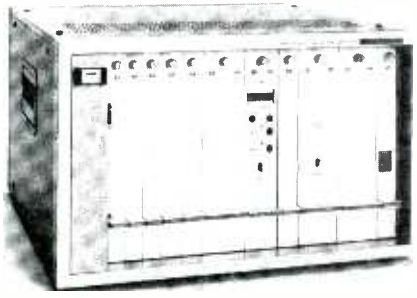
PHASE LINEAR CORPORATION
20121 48TH AVENUE
LYNNWOOD, WA 98036
(206) 774-3571

For additional information circle # 87

SONY ANNOUNCES DDU-1500 DIGITAL PREVIEW UNIT

The DDU-1510 digital preview unit, in combination with the Sony digital mastering system (PCM-1610, PCM-1600, or PCM-100 processor and BVU-200B U-Matic video recorder) provides a precise preview signal as well as program signal, allowing the cutting lathe to accurately control pitch and depth during the lacquer-cutting process.

Designed for use with digital systems, the DDU-1510 has digital input and delayed output signals. The unit's analog preview output features 12-bit precision; it also offers switchable selection of either serial or parallel data, and can be locked to any sampling frequency between 40 and 55 kHz, making it operable with any digital signal so far developed.



A manually activated de-emphasis circuit automatically detects and de-emphasizes signals to which pre-emphasis has been given, while an emphasis *Mismatch* lamp indicates proper operation.

Master signal frequency response of the DDU-1500 series is a quoted 20 Hz to 20 kHz, +0.05/−1.0 dB. Dynamic range is greater than 90 dB, while harmonic distortion is less than 0.5% at −20 dB peak levels.

SONY CORPORATION
OF AMERICA
9 WEST 57TH STREET
NEW YORK, NY 10019
(212) 371-5800

For additional information circle # 88

PEARL SOUND ANNOUNCES WIDEBAND SPEAKER SYSTEM

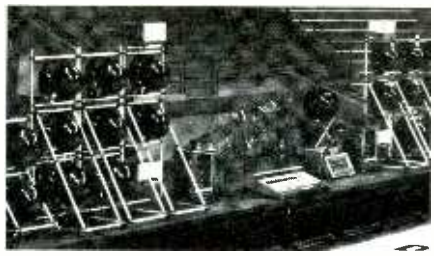
The new systems are said to be capable of producing sound pressure levels equal to those

. . . continued overleaf —

of conventional systems three to five times their size and weight. This is achieved by employing Soundsphere cabinets (fiberglass, spherical enclosures coupled to a parabolic reflector manufactured by Sonic Systems, Inc.) in the bass and mid-range; by utilizing the Electro-Voice "constant-directivity" RC Series horn/driver systems for the high frequencies; and by mounting these units on super-lightweight aluminum stands specifically designed for Pearl Sound Systems, developed by Ultimate Support Systems, Inc.

Soundspheres help to reduce standing waves that may occur because the sound is dispersed and circulated in a cardioid pattern, rather than in the more usual direct-narrow-angle pattern (which has a tendency to permit strong reflections from any flat surfaces perpendicular to the plane of dispersion).

The Maximus 3-way system features six



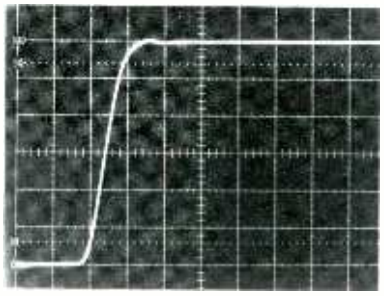
vented low-bass Soundsphere enclosures, four mid-range Soundsphere enclosures, and four Electro-Voice constant-directivity horns. Components are mounted on lightweight stands which allow the horns to be precisely aimed and locked in the position that satisfies the demands of each listening environment. The entire system with all Soundspheres, Electro-Voice Horns and Ultimate Support Stands weighs only 795 pounds.

PEARL SOUND, INC.
BOX 858
LOUISVILLE, CO 80027
(303) 442-4104

For additional information circle # 91

JENSEN INTRODUCES HIGH PERFORMANCE DIRECT BOX TRANSFORMER

A combination of sophisticated computer modeling techniques and Jensen's years of transformer design expertise have resulted in an all-new direct box transformer that is said to be at least twice as good as its predecessor, the JE-DB-D.



2 kHz Square Wave 5 µS/Division

A direct box transformer must exhibit the proper impedance at its input and output in order to preserve correct frequency and phase response in the guitar and mixer. In addition, an extremely important criterion is immunity from hum and noise. Jensen's new JE-DB-E is claimed to meet these criteria. The JE-DB-E has independent Faraday shields (electrostatic screens) for the primary and secondary, permitting complete isolation of the guitar or other instrument from the amplifier or mixer. The transformer's Mu-metal case provides an additional 30 dB of magnetic shielding.

To sound "transparent," a direct box transformer must be able to handle the high levels and sharp transients generated by guitars and other live instruments without saturating or distorting, with bass frequencies being the most demanding. The JE-DB-E handles up to +19 dBv at 20 Hz, and +30 dBv at 50 Hz, before saturation. Below saturation, distortion is cut to less than 0.1% at 20 Hz, and decreases by half for each octave higher, measuring less than 0.005% at 1 kHz. The JE-DB-E has very wide bandwidth (-3 dB at 80 kHz), which results in a very clear top-end.

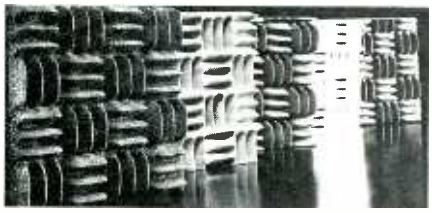
Price is $32.00 in single quantities until March 1, 1982.

JENSEN TRANSFORMERS
10735 BURBANK BLVD. DEPT. R
NORTH HOLLYWOOD, CA 91601
(213) 876-0059

For additional information circle # 92

SONEX ACOUSTICAL FOAM IN NEW FLAME-RETARDANT COLORS

Illbruck/usa is now offering Sonex in a variety of colors — blue, green, brown, and orange — in addition to the standard silver. The new colors are painted with a special fire-retardant paint that creates a striking vividness and sparkle to the foam, while adding an extra measure of safety. Sonex is available in four-foot square sheets in 2-, 3-, or 4-inch thicknesses directly from the manufacturer's stock.



The patented Sonex "sculpturing" of the contoured surface is said to significantly increase its sound-absorbing characteristics, functionally scattering, deflecting and dissipating sound energy. As a sound absorber, Sonex is described as being four to seven times more effective than ceiling tile or carpeting. It can be used to dampen or control sonic standing waves or resonances, or simply to eliminate irritating noise.

A new 12-page color brochure is also available by writing to:

ILLBRUCK/USA
3800 WASHINGTON AVENUE NORTH
MINNEAPOLIS, MN 55412
(612) 521-35555

For additional information circle # 93

LOFT MODEL 402 ELECTRONIC CROSSOVER FROM PHOENIX

The Model 401 is an 18 dB per octave electronic crossover with ruler flat frequency response (summed amplitude), and features two-way/stereo or three-way/mono operation. Crossover points are continuously adjustable from 40 Hz to 8 kHz. All crossover controls are recessed to avoid an accidental change in frequency.

Input and output LED's are incorporated to indicate operating levels, while input and output controls are detented and calibrated. An electronic suppression circuit prevents power

thumps to provide additional safety for speakers and drivers. High-speed, low-noise circuitry is used throughout to increase transient response and provide the lowest possible distortion.

The unit 402 will accept balanced or unbalanced inputs and provide high output levels into 600 ohms which, according to the manufacturer, makes this unit ideal for any quality professional application.

PHOENIX AUDIO LABRATORIES
91 ELM STREET
MANCHESTER, CT 06040
(203) 649-1199

For additional information circle # 96

LOW COST 16/8 CONSOLE FROM SPECK ELECTRONICS

The new Speckmix 16 recording console features 16 complete input channels; eight mixing bus outputs; 8-track pannable assign; six-frequency/3-band equalizers; lownoise, transformerless mike inputs; control room and studio playback; talkback and cue prompts; independent stereo mixdown bus; +4 dBm operating levels; stylish European color coded knobs; and solid oak sides.

Basic specifications include frequency response 23 Hz to 20 kHz (± 1 dB), maximum output level +22 dBv, and noise -72 dB (mike input to bus output).

Suggested list price of the Speckmix 16 is $3,575.00.

SPECK ELECTRONICS
12455 BRANFORD ST. UNIT 2
ARLETA, CA 91331
(213) 897-4188

For additional information circle # 97

TEAC ANNOUNCES NEW PE-250 CARDIOID MIKE

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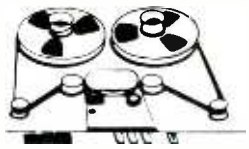

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STUDIO UPDATE

Northeast:

☐ **CIANI/MUSICA** (New York City) has installed a new Otari 24-track MTR-90 equipped with digitally-controlled transport logic, and a full complement of auxiliary features. The studio, owned by **Suzanne Ciani**, also boasts a Synclavier and terminal, Prophet V, Voice Box, Vocoder, and Buchla synthesizer. *Park Avenue, New York, NY.*

☐ **TROD NOSSEL RECORDING STUDIOS** (Wallingford, Connecticut) has added phase correction to its Scully 100-16 and 280-2 recorders. These machines and the facility's API console have also received new capacitors throughout, resulting in much better transient response and greatly reduced distortion. New equipment includes two Pultec EQP-1 and EQH-2 tube equalizers. *10 George Street, Wallingford, CT 06492. (203) 265-0010.*

☐ **DIGITAL RECORDING SYSTEMS** (New York City) has located to the Big Apple from Elkins Park, Pennsylvania, and is now offering full digital recording and editing services. Studio equipment includes the new Sony PCM-1600 digital processor and the DAE-1100 digital audio editor. The chief engineer and co-owner **Peter Jensen** founded the company with **Terry Tobias** in 1979. *424 Greenwich Street, New York, NY. (212) 431-9184.*

☐ **STILLWATER SOUND STUDIO** (Stamford, Connecticut) has added two AKG C-414 mikes to its equipment list, along with two Electro-Voice RE-20 mikes and two Universal Audio 175-B limiters. *11 Turn of River Road, Stamford, CT 06905.*

***Normandy Sound**, Warren*

☐ **SIGMA SOUND STUDIO** (Philadelphia, Pennsylvania) follows the inauguration of its new 46-track Studio I with the appointment of **Joe Bees** to the position of media services engineer for both the Philadelphia and New York studios. Bees will be working directly with **Wally Hayman**, recently appointed director of media services. Hayman views Bees' joining the Sigma staff as "a natural progression that will enhance and simplify our goals of successful studio diversification." *212 12th Street, Philadelphia, PA 19102.*

☐ **NORMANDY SOUND** (Warren, Rhode Island) has updated with a new Live,end/Dead-end™ control room. Designed by **Dan Zellman** of Howard Schwartz Studios, New York, the 1,000 square foot facility features both hard and soft surfaces, theater curtains to deaden the floor-to-ceiling convex wood wall, and a 2,000 cubic foot drum booth. The new equipment package includes a fully automated MCI JH-600 console, transformerless MCI JH-114 24-track machine, mikes by Neumann, AKG and Sennheiser, UREI and Altec monitors, and a Yamaha Conservatory grand piano. The studio is owned by **Arnold Freedman**, **Phil Green**, and **Robert Shuman**. *25 Market Street, Warren, RI 02885. (401) 247-0218.*

— *NORTHEAST ACTIVITY* —

UNIQUE RECORDING (New York City) finds producer **John Lee** recording with **Billy Scott**; **Ray Hall** and **John Fetter** producing **Chip Ellinghous**; and **The Five Knives** in tracking some tunes with producer **Nite Bob Czaykowski**. Studio engineers **Bobby Nathan**, **Michael Finlayson**, **Oscar Gerardo**, and **Peter Robbins** shared the chores behind the console on all these dates. *701 7th Avenue, New York, NY, 10036. (212) 398-0574.* ■ **TROD NOSSEL RECORDING STUDIOS** (Wallingford, Connecticut) is booking time with **The Actuals**, **Dennis Most**, and doing demo work with **Jim Martin**, **Kevin Read**, and **Tami Gooding**. **Dave Watson**, **P/K/A Ricky Aaron**, and **Margaret Thatcher and The Supply Side** have finished up projects. *10 George Street, Wallingford, CT 06492. (203) 265-0010.* ■ **THE RECORDING CENTER** (East Norwalk, Connecticut), in collaboration with **Executive Graphics, Inc.** has put together an audio-visual presentation for the New York League for the Hard of Hearing. The multi-media program features **Dina Merrill** as narrator, and was produced by **Doug McLennan** of RCI and **John Sarosky** of EGI. **Pete Bastoni** engineered for RCI. *25 Van Zant, East Norwalk, CT 06855. (203) 853-3433.* ■ **KINGDOM SOUND STUDIOS** (Syosset, Long Island) is working with **Glen Kolotkin** as he produces the new **B.T. Express** album. **Preview** are recording tracks with producer **Ray Ovetsky** and engineer **Clay Hutchinson**. *6801 Jericho Turnpike, Syosset, Long Island, NY 11791. (516) 364-8666.* ■ **MASTERS BY JOHNSON RECORDING STUDIO** (Narberth, Pennsylvania) is currently producing *The Dan Fogelberg Special* for NBC's "The Source" network; **Denny Somach** co-producing with engineer **Sean McKay**. The studio is also recording Rolling Stone Magazine's *Continuous History of Rock and Roll* series. *832 Montgomery Avenue, Narberth, PA 19072. (215) 664-*

Northeast Activity . . . continued —

1188. ■ **DIGITAL RECORDING SYSTEMS** (New York City), recently re-located in Manhattan, is working on a Mahler cycle for Moss Music with **Max Wilcos**. Previous projects include the *Moving Pictures* album by **Rush**, and **Julian Bream's** *Music of Spain: The Classical Heritage. 424 Greenwich Street, New York, NY. (212) 431-9184.* ■ **STILLWATER SOUND STUDIOS** (Stamford, Connecticut) has been recording a self-produced album by **Flyte**, and demo work with **Killerwatt**; engineering by **Dominich Costanzo**. *11 Turn of the River Road, Stamford, CT 06905.* ■ **SPECTRUM RECORDERS** (Lanesborough, Massachusetts) has completed work with **The Units**; **Mass Communication** for a three-screen multi-media presentation; new tunes by **Ed Gyurasz** and three master sides scheduled for **Shendandoah**. All sessions engineered by **Peter Seplow**. *151 South Main Street, Lanesborough, MA 01237. (413) 499-1818.* ■ **ELECTRIC LADY STUDIOS** (New York City) celebrated its 11th anniversary with recent projects including *Foreigner 4*, engineered by **David Wittman** and produced by **Mick Jones**; a new single by **The Clash** engineered by **Joe Blaney** with Jones producing; tracks for The Stone's *Tatoo You*, engineered by **Brad Samuelsohn**; **Hall & Oates** *Private Eyes* engineered by **Neil Kernan**; and **The Michael Stanley Band's** *North Coast*, engineered by Samuelsohn and produced by **Eddie Kramer**. *52 West 8th Street, New York, NY 10011.* ■ **SOUNDWAVE RECORDING STUDIOS** (New York City) finds **Liz Ostrow** editing **Greg Fulkerson's** new album with engineer **Don Van Gorden**; producer **Yoshio Inomata** working on **John Coates'** *Pocono Friends, Volume 2*; and producer **Paul Marotta** mastering two singles and a disco project. *50 West 57th Street, New York, NY 10019. (212) 582-6320.* ■ **SOUND IDEAS STUDIOS** (New York City) is hosting jazz producer **Kiyoshi Itoh** and his third 32-track digital production, this time with trumpeter **Terumasa Hino**; harpsichordist **Jonathan Woods** editing his first digital effort; the cast album of Off-Broadway's *March of the Falsettos*, produced by **Hugh Fordin** and engineered by **Jim McCurdy**; and **Dave Baker** mixing a **James Brown** single. *151 West 46th Street, New York, NY 10036. (212) 575-1711.* ■ **THE WORKSHOPPE RECORDING STUDIOS** (Douglaston, New York) is recording **The Capris** for producer **Marty Pekar**, who has engineers **Rob Bengston** and **Kevin Kelly** researching original Fifties recording techniques; **Arlan Roth** tracking some tunes; Mink DeVille guitarist **Rick Borgia** producing **Andrew Humes** with **Rob Bengston** engineering; and **Harvey Brooks** and Kelly co-producing **Big Feachers**. *40-35 235th Street, Douglaston, NY 11363. (212) 631-1547.* ■ **SIGMA SOUND STUDIOS** (New York City) has producers **Mtume & Lucas** completing album projects for **The Spinners** and **Lou Rawls**, with **Gerry Block** and **Jim Dougherty** engineering; **Stevie Wonder** producing, engineering, and overdubbing two singles; **Michael Hutchinson** re-mixing a **Phyllis Nelson** single with **Jim Burgess**; **Liz Toval** recording a single with producers **D.C. LaRue** and **Jonathan Fearing**; and **The Average White Band** recording with producer **Dan Hartman**. *1697 Broadway, 10th Floor, New York, NY 10019.* ■ At **SIGMA SOUND STUDIOS** (Philadelphia, Pennsylvania) **McFadden** and **Whitehead** are producing the **O'Jays** with engineer **Dirk Devlin**; **Billy Paul** is finishing his self-produced project with engineers Devlin, **Jim Gallagher**, and **Peter Humphreys**; and **Sister Sledge** working with **Arthur Stoppe** at the board. *212 North 12th Street, Philadelphia, PA 19102.* ■ **KAJEM RECORDING STUDIOS** (Gladwyne, Pennsylvania) is recording **Willie Daniels** of The Persuasions, with **George Logis** producing and **Mitch Goldfarb** at the console; singer/songwriter **George Wallace** engineered by **Joe Alexander**; and mixdown of a **Beru Revue** album produced by **Bob McCafferty**. *1400 Mill Creek Road, Gladwyne, PA 19035. (215) 649-3813.* ■ **BLUE ROCK RECORDING STUDIO** (New York City) has D.I.R. Broadcasting producers **Bob Kaminsky** and **Paul Zullo** working on tracks for **The Jefferson Starship**, **Psychadelic Furs**, and **Charlie Pride**, with **Michael Ewasko** at the desk; **Rick Derringer** mixing a concert for D.I.R.: and **Jimmy Robinson** producing a project for artist **Jimmy Wallace**. *New York, NY.*

Southeast:

□ **DOPLAR STUDIOS** (Atlanta, Georgia) has taken delivery of a new Sphere Eclipse Model 40 by 40 console with Transamps™ and Allison 65 K automation, connected to a new Otari MTR-90 24-track. Also, an ADR F760 Vocal Stressor has been installed. Recent activity includes .38

STUDIO UPDATE

Southeast . . . continued —

Special mixing a video presentation, with **Rodney Mills** producing and engineering, and engineer **Brad Jones** mixing **Mother's Finest** for a TV special. *1922 Piedmont Circle North East, Atlanta, GA 30324. (404) 873-6941.*

☐ **SCENE THREE** (Nashville) has appointed **Ronald R. Dunn, Jr.** to the position of production engineer in charge of all audio production, both on location and in the company's video post-production facility. "With Scene Three's expansion into the music industry," explains studio president **Kitty Moon,** "it is essential that our audio equipment and personnel have the same standards of excellance that our video production has always maintained." *1813 Eighth Avenue, Nashville, TN 37203. (615) 385-2820.*

☐ **EDDY OFFORD STUDIOS** (Atlanta, Georgia) has opened in the old East Point Theater by veteran English producer/engineer **Eddy Offord.** Offord, best known as co-producer of seven albums by **Yes,** has also produced such artists as **Levon Helm, John McLaughlin, David Sancious,** and **Paul Butterfield.** The 24-track facility features a Neotek Series 3-C console custom-designed by studio operations manager **Chuck Allen,** and interfaced with MCI JH-114 24-track and JH-110 2-track mastering machines. Unique to the studio is the placement of recording equipment in the theater's orchestra pit, musicians being situated on the stage with no physical barrier between them and the mixing position. Plans currently call for use of the studio/theater for live broadcast and video bookings. *P.O. Box 90903, Atlanta, GA. (404) 766-5143.*

☐ **CRITERIA RECORDING STUDIOS** (Miami, Florida) has opened a new international division to be headed by Brazilian producer **Osni Cassab.** The new division will focus on recording artists from around the world, especially Europe, Canada, and South America. Other changes at Criteria include the additions of **Oliver Masciarotte** and **Scott H. Phillips** to the staff as maintenance engineers. *1755 North East 149th Street, Miami, FL 33181. (305) 947-5611.*

☐ **MIDDLE EAR RECORDING STUDIOS** (Miami, Florida), owned by the Bee Gees, has taken delivery of a Sony PCM-1610 digital processor, interfaced with two Sony BVU-200B recorders. The group and their co-producers, **Karl Richardson** and **Albhy Galuten** were involved with the purchase. "I first introduced the Bee Gees' organization to the Sony digital system nearly two-and-a-half years ago," recalls **Rick Plushner,** Sony digital manager. "They subsequently used the system to master Barbara Streisand's *Guilty* and *Andy Gibb's Greatest Hits.*" The delivery was timed to coincide with recording and mastering of the latest Bee Gees' album. *Miami, FL.*

— *SOUTHEAST ACTIVITY* —

WOODLAND SOUND STUDIOS (Nashville) has seen **Steve Forbert** and producer **Steve Burgh** working on an album with engineer **David McKinley; The Charlie Daniels Band,** producer **John Boylan,** and engineers **Paul Grupp** and **Russ Martin** working on a new LP; and **Barbara Mandrell** and producer **Tom Collins** laying tracks engineered by **Les Ladd** and **Steve Ham.** *Nashville, TN.* ■ **SWEETSONG PRODUCTIONS** (Parkersburg, West Virginia) has finished recording a contemporary gospel single for **Virginia Pryor;** an album for **Light;** and an audio-visual presentation for **National Home Security.** *P.O. Box 2041, Parkersburg, WV 26102.* ■ At **SOUND EMPORIUM STUDIOS** (Nashville) **Al Greene** is recording a new gospel album produced by **Tony Brown** and engineered by **Billy Sherrill;** country singer **Keith Stegall** is producing four tunes for his next album; **Sunday Sharpe** is recording a demo with engineer **Harold Lee; The Little River Band** is producing tracks in Studio A with **Ernie Rose** at the controls; and **Kenny Rogers,** producer **Larry Butler,** and engineer **Billy Sherrill** working on tracks for an upcoming album. *Nashville, TN.* ■ **MUSIC CITY MUSIC HALL** (Nashville) is recording a new LP for **Loretta Lynn** with producer **Owen Bradley** and engineer **Bill Vandevort;** a single by **Eddie Arnold** with producer **Norro Wilson** and engineer **Bill Harris;** tracks by **B.B.King** produced by **Stewart Levine;** and an album project by flutist **James Galway** produced by **Tom Collins.** *25*

Southeast Activity . . . continued —

Music Square East, Nashville, TN 37203. (615) 244-1060. ■ At **REFLECTION SOUND STUDIOS** (Charlotte, North Carolina), **Robert McLure** is laying down tracks with producer **Jamie Hoover** and engineer **Mark Williams**; **Sugarcreek** is producing a new album with Williams at the console; and **Brad Kelly** is producing **The Junction** jingles with **Steve Haigler** engineering. *1018 Central Avenue, Charlotte, NC 28204. (704) 377-4596.* ■ **ARTISAN RECORDERS** (Pompano Beach, Florida) supplied its mobile recording unit to mix a live broadcast of **Peter Frampton** from the Agora Ballroom in Hallandale, Florida; a concert broadcast of **Al Jarreau** from The Sunrise Musical Theater in Fort Lauderdale, Florida; and a recording of **Peter Graves'** big band and **The Captive Band** at an outdoor concert. The truck has also been chosen again by the **Fort Lauderdale Symphony Orchestra** to record its entire concert season. **Peter Yianilos** and **Richard Hilton** engineered the above projects. *1421 South West 12th Avenue, Pompano Beach, FL 33060. (305) 786-0660.* ■ **CRITERIA RECORDING STUDIOS** (Miami, Florida) had the **Bee Gees** in doing overdubs to the *Living Eyes* album produced by **Karlbhy-Gibbs** with **Don Gehman** engineering; **Victor Willis,** late of The Village People, tracking with **Howard Albert** co-producing and engineer **Ron Albert**; and a **David Johansen** single mastered by **Mike Fuller** at the Criteria Cutting Center. *1755 North East 149th Street, Miami, FL 33181. (305) 947-5611.* ■ At **STRAWBERRY JAMM** (West Columbia, South Carolina) **Bob Ford** with **Almost Nuts** has been preparing for a live, on-loction album with **David Spinks** in charge of field engineering; and **The Rob Crosby Group** is producing its next demo tape. *3964 Apian Way, West Columbia, SC 39269. (805) 356-4540.*

South Central:

☐ **TM PRODUCTIONS** (Dallas, Texas) has re-arranged a large amount of its equipment with the addition of a new MCI 36/32 console to its orchestra-size Studio A. With that move, the old MCI 28/24 desk was installed in Studio B and that room's old 24-channel console placed in Studio C. All three of the studios in the 32,000 squre foot entertainment complex now have full 24-track capability, according to vice-president and general manager **Buddy Scott.** *Dallas, TX.*

☐ **SUNDANCE SOUND STUDIOS** (Houston, Texas), a new 16-track facility, features such outboards as a Lexicon Model 224 digital reverb, dbx 165 compressor/limiters, Delta Lab DL-2 DDL, Orban De-Esser, and a full complement of noise-gates and equalizers. Mikes are by Shure, AKG, Sennheiser, and Electro-Voice, while the instrument list includes a Yamaha grand piano, Prophet V synthesizer, and ARP String Ensemble, Music Man and Fender amps, and a Tama drum kit. **Mark Richardson** is the studio manager, and **Les Williams** the chief engineer. *3330 Walnut Bend Lane, Houston, TX 77042. (713) 977-9165.*

☐ **BOUTWELL RECORDING STUDIOS** (Birmingham, Alabama) has named **Tony Wachter** as director of commercial jingle and music production. Since joining the company two and one-half years ago, Wachter has engineered many successful jingle and record packages, and recently completed the "Holiday on Ice/Disney on Ice" music package. According to studio president C. **Ed Boutwell,** Wachter will continue to act as a production engineer for the 24-track, MCI-equipped studio. *720 South 23rd Street, Birmingham, AL 35233. 251-8889.*

☐ **RAMPART STREET RECORDING STUDIO** (Houston, Texas) has taken delivery of a new transformerless Soundcraft 1624 console with 32-channel re-mix capability. The desk was supplied by Abadon Sun, Inc. of San Antonio, Texas. *6105 Jessamine, Houston, TX 77081. (713) 772-6939.*

— SOUTH CENTRAL ACTIVITY —

GOODNIGHT DALLAS (Dallas, Texas) reports **Pat Benatar** completed mixing her live performances for *The King Biscuit Flower Hour* with staff engineer **Tom "Gordo" Gondolf**; **The Fabulous Thunderbirds** cutting tracks for an upcoming album; and studio owner **Gordon Perry** acted as arranger for the title cut of Stevie Nicks' solo album, *Bella Donna. 11260 Goodnight Lane, Dallas, TX 75229.*

. . . continued overleaf —

STUDIO UPDATE

South Central Activity . . . continued —

(214) 241-5182. ■ **OMEGA AUDIO AND PRODUCTIONS, INC.** (Dallas, Texas) travelled to Lubbock to record a live album by **The Planets** at the Fat Dawgs Club, with producer **David McLarty** and engineers **Paul Rogers, Paul Christensen,** and **Russell Hearn.** *Box 71, 8036 Aviation Place, Dallas, TX 75235. (214) 350-9066.* ■ **THE MISSISSIPPI RECORDING COMPANY** (Jackson, Mississippi) is working with **Hank Williams Jr.'s** road band, **Bama; Jerry Puckett** producing. *107 North State Street, Jackson, MS 39205. (601) 354-0857.* ■ **PRECISION AUDIO** (Dallas, Texas) has been tracking **Roger Boykin's** latest jazz album produced by the artist and engineered by **Rick Sheppard;** new wave artists **NCM** recording a single; **Paul Dana** working on a single; and **John Henry Miller's** gospel project. *11171 Harry Hines, Suite 119, Dallas, TX 75229. (214) 243-2997.* ■ **RAMPART STREET RECORDING STUDIO** (Houston, Texas) has completed singles for **J.W. Wier** and **Wilson Jay,** and an EP for **Z-Rocks;** engineering by **Dan Yeaney. The Noise** has been mixing their upcoming release with engineer **Steve Ames.** *6105 Jessamine, Houston, TX 77081. (713) 772-6939.* ■ **GP STUDIO PRODUCTIONS** (Austin, Texas) has released the first project on its PSP Records label, **Gary Powell's** *The Music Is Everything,* recorded at the studio facility. *303 West 12th Street, Austin, TX 78701. (512) 478-6941.* ■ **MASTER SOUND RECORDING STUDIOS** (Atlanta, Georgia) is working with *Coast to Coast Soul,* a syndicated black music radio show produced by **Frank** and **Bob Williams** and engineered by **Buzz Richardson; Bobby Robinson** is producing **Midnight Blue's** latest album with **Ron Christopher** at the board; producer **Steve Buckingham** mixing **Bette LaVette's** next project with **Joe Neil** engineering; and gospel groups **The Florida Boys** and **The Rex Nelon Singers** recording. *1227 Spring Street North West, Atlanta, GA 30309. (404) 873-6425.* ■ **SUNDANCE SOUND STUDIOS** (Houston, Texas) is recording an album by **The Scott Gertner Group;** a single produced by **Mark Holden** for **Heidi Hendricks;** and a number of commercial projects. *3330 Walnut Bend Lane, Houston, tX 77042. (713) 977-9165.*

Midwest

☐ **AUDIOCRAFT RECORDING COMPANY** (Cincinatti, Ohio) has upgraded Studio A to 24-track with work proceeding on video-sweetening capability. New additions include an MCI JH-114 transformerless 24-track recorder with Autolocator III, plus two BTX Models 4500 SMPTE time code synchronizers, 5400V time code generator, and 4600 tape controller. The recently remodeled Studio A is centered around an Allen-Heath 28/24 Syncon Series B console, and features 34-tracks of dbx noise reduction and a full complement of outboard gear. A variety of keyboards is offered as well, including a Steinway B grand piano. *915 West 8th Street, Cincinnati, OH 45203. 241-4304.*

☐ **CUSTOM RECORDING STUDIOS** (Minneapolis, Minnesota) has upgraded with the addition of a new Otari MX-5050 8-track recorder. Other units include two Crown 822 mastering machines, while the mike selection features Neumann, AKG, and RCA models. The studio is owned and operated by **Jim Reynolds.** *3829 Scott Avenue North, Minneapolis, MN 55422. (612) 535-2587.*

☐ **ZENITH/db STUDIOS** (Chicago) is the name of a new firm operating what was once the Sonart Studios, according to **Roni Laurie,** the company's production coordinator. *676 North La Salle Street, Chicago, IL 60610. (312) 944-3600.*

☐ **STUDIO G RECORDING** (Clayton, Missouri) has added **Gordon Rauss** to its engineering staff. Now in its second year of operation, Studio G is a full-service advertising, audio/visual, and film sound facility featuring an MCI JH-110B 8-track recorder, Neotek Series II console, and 6-track 16 mm film mixing. A new transfer/assembly room has also been added. **Greg Glazier** is the owner/chief engineer. *214 South Bemiston, Clayton, MO 63105. (314) 727-0770.*

☐ **THE CHICAGO RECORDING COMPANY** (Chicago) has installed a new EMT 251 digital reverb unit. *528 North Michigan, Chicago, IL 60611. (312) 822-9333.*

— *MIDWEST ACTIVITY* —

SUPER-LYC'S RECORDING STUDIO (Warren, Michigan) has finished work with **Alux** on their album produced by **Beau Williams** and **John Jaszcz**; **writer/arranger Bugs Bedow** is producing a new project with musicians **Earl Klugh** and **Ralph Armstrong**, with **Beau Williams** and **Greg Riley** engineering; **Jeff Wells** and **Jim Danberg** are completing a new project; and **Sly Stone** and **Bootsy Collins** have just finished tracks. *31925 Van Dyke Avenue, Warren, MI 48093. 979-2305.* ■ **PINEBROOK RECORDING STUDIOS** (Alexandria, Indiana) has seen **the Bill Gaither Trio** and **Ronn Huff** recording vocals for a new Trio album, **Buryl Red** doing orchestral recording for the Baptist Sunday School Board; and **Tim Simonec** working on a film score for Anderson Films. Engineering these and other projects are **John Bolt, Bob Whyley, Toby Foster,** and **Jim Shefler**. *P.O. Box 146, State Road 9 South, Alexandria, IN 46001. (317) 724-7721.* ■ **THE RECORDING CONNECTION** (Beachwood, Ohio) is working with Cleveland-based band **Lefty** on an album project with **Dale Peters** engineering; NBC's *The Source* radio and EMI Video recording **The Michael Stanley Band** and **Donnie Iris** at the Blossom Music Center in Cleveland; **Peaches & Herb** recording for Westwood One in Chicago; and **Blackfoot** at the Cleveland Music Hall for *The Source. 23330 Commerce Park Road, Beachwood, OH 44122. (216) 464-4141.* ■ **SUPERDISC INCORPORATED** (Detroit, Michigan), after completing a year's contract with the **Parliament-Funkadelic** group, is servicing outside clients once again. The operation recently finished overdubs and mixing on **Roger Troutman's** upcoming project, and is currently involved with sessions for **Juni Morrison, Tommy Megee** produced by **Proce West, Shelly Quale** produced by **Barrett Strong,** and **Tony Hanna** produced by **Rafik Hobeika.** *14611 East Nine Mile, East Detroit, MI 48021.* ■ **PEARL SOUND** (Ann Arbor, Michigan) is recording **Trainable** with producer **Scott Forman** and engineer **Ben Grousse.** *Ann Arbor, MI.* ■ At **HOME GROWN STUDIOS** (Bloomington, Indiana) **Phil Kern** and **Bruce Cambell** spent several sessions recording a demo of their new dramatic musical, *The Extraordinary Calling of Mother Ann Lee;* the power trio **Rampage** was in recording a four-song demo; **John Lowrie** and **Ron Keithe** have begun their second LP; and the **Kaithe Lowrie Duet** has been in working on their album under the working title, *Bridge. 611 East Empire Mill Road, Bloomington, IN 47401. (812) 824-2400.* ■ **AJAX RECORDING TEAM** (Fort Wayne, Indiana) has been recording **Fred Rothert's** second album; a single for **Ric Kirk;** and a demo for **Rick Curtis. Craig Harding** recorded and mixed all three projects. *902 West Wayne Street, Fort Wayne, IN 49804. (219) 423-3479.* ■ **THE CHICAGO RECORDING COMPANY** (Chicago) has **Kitty and the Heywoods** with producer **Gene "Daddy G" Barge** and engineer **Hank Neuberger;** R&B group **Amuzement Park** recording a debut LP with producer **Dunn Pearson,** engineer **Phil Bonanno, and assistant producer Michael Szarzinski;** and **Skip Haynes,** late of Aliotta, producing his next LP with engineer **Steve Kusciel.** *528 North Michigan, Chicago, IL 60611. (312) 822-9333.* ■ **SOLID SOUND** (Ann Arbor, Michigan) reports **John Pace** producing a demo for **Curtis Hyflash; Larry Santos** finishing a single; **Give Away** tracking a demo; country artist **Marsha Dee** completing a new single; **Rick Davis** completing his next LP; **Dave Barrett** working on his upcoming single; and **Jack Mollette** tracking his next single release. All the sessions were engineered by **Will Spencer** and **Rob Martens.** *P.O. Box 7611, 1289 Dixboro Road, Ann Arbor, MI 48107. (313) 662-0667.*

Mountain:

☐ **THE LAST RECORDING STUDIO,** (Boulder, Colorado) has added **John Paul Chybion** to a new staff position of executive assistant and promotional director. Chybion is a 1981 graduate of the University of Colorado College of Music. The announcement was made by **Mark Barnett,** president of the 8-track facility. *P.O. Box 6050, Boulder, CO 80306. (303) 442-1158.*

☐ **LAW RECORDING STUDIO** (Las Vegas, Nevada) has installed a custom Demedio API console, interfaced with an MCI 24-track deck. *2570 East Tropicana Avenue, Suite 19, Las Vegas, NV 89121. (702) 451-6767.*

STUDIO UPDATE

— *MOUNTAIN ACTIVITY* —

LAW RECORDING STUDIO (Las Vegas, Nevada) sees **Kay Shannon** recording her upcoming debut LP with producer/engineer **Lee Watters**. *2570 East Tropicana Avenue, Las Vegas, NV 89121. (702) 451-6767.*

Southern California:

☐ **OVERLAND RECORDING STUDIO** (Costa Mesa) has been purchased by **Iren Koster** and **Teddy Randazzo** to form an organization to help acts with all steps of recording, from hiring musicians, to arrangements, material, and production. The partners have worked with such artists as **Linda Ronstadt, Frankie Valli, Peter Noone, The Temptations,** and **Frank Sinatra.** *3176 Pullman Street, Suite 123, Costa Mesa, CA 92626. (714) 957-0633.*

☐ **GOLDSTAR RECORDING** (Hollywood) has taken delivery of a new Melkuist VCA fader automation system from Studio Maintenance Service. The system will be fitted into a Trident TSM console. *Hollywood, CA.*

☐ **SKIP SAYLOR RECORDING** (Los Angeles), a new 24-track recording facility owned and operated by engineer **Skip Saylor,** is equipped with an MCI 24-track recorder fed by a Trident/Spectra Sonics console, JBL, Hemisphere, and Auratone monitors, an Eventide Harmonizer® and DDL, Lexicon Prime Time, two stereo Ecoplates, UREI limiters, and two-track recorders by Studer and Scully. **Katie Saylor** is studio manager, and **Jon Gass** staff engineer. *506 N. Larchmont Bl. Los Angeles, CA 90004 (213) 467-3515.*

☐ **WALLY HEIDER RECORDING** (Hollywood) Studio 3 has received a new set of UREI 811 monitors, and a Neve 8088 console. A transformerless MCI JH-556 console and JH-24 multitrack recorder were added recently to Live-end/Dead-end™ Studio 4. The smaller Studio 7 has been enlarged and upgraded with improved acoustics, UREI Time Aligned™ monitors, and an Auditronics 501 control board. UREI 6500 power amps have been installed throughout the complex. "We're trying to offer a wide range of studio designs and features in order to appeal to a wide range of clients and projects," says owner **Janna Feliciano**. "We've got facilities for demos and small overdub sessions; all the way up to our two huge scoring rooms A and B." Recent activity includes producer engineer **Bones Howe** working on the soundtrack for Francis Ford Coppola's *One From The Heart. 1604 N. Cahuenga Bl., Hollywood, CA 90028. (213) 466-5474.*

☐ At **PASHA MUSIC HOUSE** (Hollywood), company president **Spener Proffer** has appointed **Nadya Bell** to the post of studio manager. Most recently Nadya served as traffic manager for the Wally Heider Studios, and for the three years prior to that was the studio manager for El Dorado Studio. Nadya came to the United States in 1976 from her native England, following work with such artists as Steve Winwood and Jeff Beck. *5615 Melrose Avenue, Hollywood, CA 90038. (213) 466-3507.*

— *SOUTHERN CALIFORNIA ACTIVITY* —

STUDIO SOUND RECORDERS (North Hollywood) finds **Peaches & Herb** and **Rick James** doing mixdown with **Biff Dawes; Richie Griffin** and engineer **John Volaitis** working with **Gamut; George Tobin** producing **Lani Hall** with **Howard Wolen** at the console; **Natalie Cole** doing pre-production with producer George Tobin; **David Courtney** producing **Leroy Simmons** with **Joe Chiccarelli** behind the board; **Richard Kimball** producing *The Rockets Live In Concert* with the band's regular engineer **Johnny Sandlin** co-

Southern California Activity . . . continued —

producing; **Smokey Robinson** doing pre-production for his next album; and guitarist **Neil Geraldo** overseeing the production of Pat Benatar's live broadcast from Oakland for Westwood One and producer Richard Kimball. *11337 Burbank Boulevard, North Hollywood, CA 91601.* ■ At **SOUNDCASTLE RECORDING STUDIOS** (Los Angeles) **Weather Report** is mixing with **Joe Zawinul** co-producing and engineer **Brian Risner**; **Robert Williams** cutting tracks with producer **Joe Chiccarelli**; **Chris Bond** producing a debut album by **Steve Wood** with **John Mills** engineering; and **Mike Post** producing his own album with **Matt Hyde** at the board. *2840 Rowena Avnue, Los Angeles, CA 90039. (213) 665-5201.* ■ **INTERNATIONAL AUTOMATED MEDIA** (Irvine) finds **Denny Correll** recording with producer **Bill Maxwell** and engineer **Willie Harlan**; Radio City Music Hall finishing up *The Twelve Days of Christmas*; and **Pappa Doo Run Run** recording on the 3M 32-track digital system with **Paul Freeman** at the console. *17422 Murphy Avenue, Irvine, CA 92714. (714) 751-2015.* ■ **SKIP SAYLOR RECORDING** (Los Angeles) has been tracking a **Terraplane** session with producer **Craig Sackheim**; singer/songwriter **Essra Mohawk** produced by **Daoud Shaw**; Chicago jazz group **Apprentice** with producer/manager **Hank Dungy** and **David Leonard** at the board; **The Burgers** working with producer/bassist **Skipper Wise**; and five tracks for **Dream Cathedral** produced by **Graham Daddy** with **Jon Gass** at the board. *506 North Larchmont, Los Angeles, CA 90004. (213) 467-3515.* ■ **REALIFE STUDIOS** (Thousand Oaks) has recorded a single by **Steps**; **Rhett Creamer** and **Nick Johnson** is producing the latest demo by **Derald Conway** with **Bruce Jackson** at the board. *1888 La Granada, Thousand Oaks, CA 91362. (805) 496-5756.* ■ **DIRK DALTON RECORDERS** (Santa Monica) finds **Titch** tracking an album with **Frank Unruh** producing, assisted by **Ron Krasinski**; **Jimmy Photoglo** recording a project for Japanese release; and **Towana Hill** working with producer **Kent Harris**. **Dirk Dalton** was at the console for all the sessions. *3015 Ocean Park Boulevard, Santa Monica, CA 90405.* ■ **TWILIGHT RECORDING STUDIO** (Laguna Hills) has been recording **The Executives**; tracks for a demo by **Johnny Almond**; and a debut EP by **The Rounders**. *23342 South Pointe Drive, Laguna Hills, CA 92653.* ■ At **SUNSET SOUND STUDIO** (Hollywood) **Moon Martin** is working on material produced by **Andrew Gold**, with **Jim Isaacson** engineering; **Toto** is doing overdubs with **Tom Knox** at the console; and **Juice Newton** is mixing with producer **Richard Landis** and engineer **Joe Chicarelli**. *6650 Sunset Boulevard, Hollywood, CA 90028. (213) 469-1186.* ■ **THE RECORD PLANT** (Los Angeles) is recording Welsh singer/songwriter/guitarist **Mikel Japp**, with **Bob Merritt** behind the console. Japp, who has written material for The Baby's, Paul Stanley, and The Jefferson Starship, is currently working with his own band. *Los Angeles, CA.* ■ **FOOTPRINT SOUND STUDIOS** (Sherman Oaks) is recording a **Glen Campbell's** self-produced single engineered by **Marc Piscitelli**; **Tanya Tucker's** latest single, "Rodeo Girls"; and **Carl Weather's** upcoming release produced by **Hadley Murrell**. *13216 Bloomfield Street, Sherman Oaks, CA 91423. (213) 872-1854.* ■ **DOCTOR MUSIX RECORDING STUDIOS** (Hollywood) finds **Walter Murphy** producing two albums for **Lora Lee Cliff** and **Gary Marx**, and a film score; the latter dates being the first sessions in a new expanded room capable of accommodating 65 players. **Peter Hirsh** is engineering these dates, as well as bookings by **Desiree**, which he is co-producing, and **Kitty Lester's** latest album produced by **Dave Bell**. *6717 Melrose Avenue, Hollywood, CA 90038. (213) 93038. (213) 930-2501.* ■ At **THE MUSIC GRINDER RECORDING STUDIO** (Los Angeles) **Richard Kerr** is laying down tracks with **Gary Skardina** co-producing and engineering; **Chubby Checker** is recording with **Evan Pace** producing and new first engineer **Robert Feist** sharing the console chores with Skardina and **John Kovarek**; **The Red Devils** are in working with producer **Paul Jarvis**; and **Richard "Dimples" Fields** is producing **Betty Wright's** upcoming album. *7460 Melrose Avenue, Los Angeles, CA 90046. (213) 655-2996.* ■ **KENDUN RECORDERS** (Burbank) reports mastering activity includes the latest **Van Morrison** album with **Kent Duncan** working with engineer **Jim Stern**; and **Jeff Saunders** cutting **Lonnie Jordan's** latest single by the **Allman Brothers**, plus an upcoming **Jack Jones** album. **The Jones Girls** are mixing with producer **McKinley Jackson** and engineer **Barney Perkins**; **The L.A. Boppers** are overdubbing and mixing with producer **Augie Johnson** and engineer **Mike Evans**; and producers **Christopher Cross** and **Michael Ostin** are supervising

— continued overleaf . . .

STUDIO UPDATE

Southern California Activity . . . continued —

instrumental and vocal overdubs for **The Alessi Brother**, with engineer **Chet Himes**. *619 South Glenwood Place, Burbank, CA 91506. (213) 843-8096.* ■ At **ARTISAN SOUND RECORDERS** (Hollywood) **Greg Fulginiti** mastered **Count Basie's** upcoming digital release produced by **Eric Miller**; a **Keith Olsen**-produced album of **Sheila**; **Norman Connors'** self-produced album; and the soundtrack album of the **Steve Martin** motion picture, *Pennies From Heaven*, produced by **William McEuen**. Singles have also been cut for **Eddie Rabbitt, Steve Martin, Pat Benatar**, and **The Chipmunks**. *1600 North Wilcox Avenue, Hollywood, CA 90028. (213) 843-8096.* ■ **NSP STUDIOS** (Hollywood) is tracking **Arthur G. Wright, Edmund Sylvers**, and vocalist **Freeman King**. *6362 Hollywood Boulevard, Hollywood, CA 90028. (213) 462-6524.* ■ At **GROUP IV RECORDING** (Hollywood) **Joe Pass** is tracking a new album produced by **Norman Granz**, with **Dennis Sands** and **Paul Aronoff** engineering. *1541 North Wilcox, Hollywood, CA 90028. (213) 466-6444.* ■ **HIT SINGLES RECORDING SERVICES** (San Diego) relocated its studio hardware to The Spirit Club in San Diego for the live recording of ten bands in a period of three days. Main engineering chores were handled by **Rick Bohlman, Randy Fuelle** covering the second engineering chores as well as acting as stage manager. The recordings will be re-mixed and released as a compilation album featurring one song from each band. *College Grove Center, Lower Court 4, San Diego, CA 92115. (714) 265-0524.*

Northern California:

☐ **THE AUTOMATT** (San Francisco) reports that **Michelle Zarin** has been named studio manager by owner **David Rubinson**. Michelle has a wide background in studio administration, serving as studio manager and then general manager of the Sausalito Record Plant; special consultant to Bill Szymczk on the opening of his Bayshore Studio in Coconut Grove; studio manager of the Los Angeles Record plant; and consultant to **Tower of Power**. **Michelle Meisner**, who has been serving as studio manager at the facility, has decided to return to the field of engineering. She has been named administrator of mastering for The Automatt, and will train as a mastering engineer in addition to working as a recording engineer. *827 Folsom Street, San Francisco, CA 94107. (415) 777-2930.*

☐ **CORASOUND RECORDING** (San Rafael, California) is currently involved in a major upgrade, with a Neotek Model Series II console with a 28-input main-frame on order. The new desk will complement the facility's Ampex 16-track and Otari 8-track recorders. *122 E. Paul Drive, San Rafael, Ca 94903. (415) 472-3745.*

— NORTHERN CALIFORNIA ACTIVITY —

At **THE AUTOMATT** (San Francisco) **Michael McDonald** and other Doobie Brothers are doing vocal overdubs on an album project; **Con Funk Shun** is finishing up their next LP with **Leslie Ann Jones** engineering; **Kool and the Gang** are doing vocal overdubs in Studio B. *827 Folsom Street, San Francisco, Ca 94107. (415) 777-2930.* ■ **DIFFERENT FUR RECORDING** (San Francisco) has been playing host to **The Sir Douglas Quintet**, engineered by **Stacy Baird** and **Roger Harris**; **Bill Summers** and **Summer's Heat** cutting an album; **The Kronos Quartet** recording a direct-to-digital tape of Weburn's *Five Movements for String Quartet*, produced by **Pat Gleeson** and engineered by **Don Mack**; and female vocalist **Sammie Helm** tracking two of her original songs. *3470 19th Street, San Francisco, CA 94110. (415) 864-1967.* ■ **THE MUSIC ANNEX** (Menlo Park) played host to acoustic guitarist **Will Ackerman** for his latest album, *Passage*, recorded entirely via the Sony PCM-1600 digital audio processor. "The absence of background tape hiss is striking about the Sony system, plus the remarkable silence that provides total transparency," said Ackerman. The natural guitar sound, he explained, is initially quite loud, but as the instrument 'rings out' and the sound decays, the recording levels become much reduced. Digital frees the

Northern California Activity . . . continued —

engineer of having to compromise between the 'attack' and the 'decay' when setting levels. *Menlo Park, CA.* ■ **CORASOUND RECORDING** (San Rafael) has completed projects with **Bud Cockrell** for French National Radio; singles and EP's for **Blake Quake and the Tremors, The Wally Band,** and **John McKindle**; and an album for **The Hoovers.** *122 E. Paul Drive, San Rafael, CA 94903. (415) 472-3745.* ■ ***HARBOR SOUND RECORDING*** (Sausalito) is recording a self-produced demo by **Pete Sears** of The Jefferson Starship engineered by **Nancy Evans, Paul Stubblebine,** *and* **Dana Chappelle; Tom and Lis Fraser** working with members of the **Tazmanian Devils** on their next project; and **The Berkeley Psychic Institute Choir** as they finish their gospel/rock/country album co-produced by the choir, **Richard Lawrence,** and **Richard Williams.** *301 Harbor Drive, Sausalito, CA 94965.*

Northwest:

☐ **TRIAN STUDIOS** (Redmond, Washington) has opened a 24-track recording facility, located on the former site of Pacific West Recorders. The complex has undergone complete remodeling, with design and construction handled by **Dick Maltby** and chief engineer **Larry Nefzger.** The equipment list boasts a Neotek IIIC 28/24 console interfaced with an MCI 24-track recorder and two MCI two-track and mono machines. Outboards include an EMT 140TS plate, ADR, dbx, and UREI limiters, Lexicon DDL, Symetrix noise gates, and Orban parametric EQ. A Yamaha C-7 grand piano is offered, as well as a Prophet V synthesizer, a Dyno-My-Piano prepared Fender Rhodes, and a Gretsch drum kit. Monitors are by Fostek, JBL, and Auratone, and mikes by Sony, AKG, Shure, Sennheiser, Neumann, and Crown PZM. The facility is owned by **Jim Loomis** and managed by **Dan Foster.** *4572 150th Avenue North East, Redmond, WA 98052. (206) 881-9322.*

☐ **BEAR CREEK STUDIO** (Woodlinville, Washington) has installed a Trident TSM console in its newly redesigned studio. A large jacuzzi and sauna complement the working facility located on a 10-acre estate located north of Seattle. *6313 Maltby Road, Woodinville, WA 98072. (206) 481-4100.*

☐ **THE NOVA MUSIC GROUP** (Seattle, Washington) reports that keyboardist/composer **David Lanz** has been added as creative director of the company. Lanz is an experienced studio musician, and has appeared on many national and regional ads. *1001 4th Avenue, Seattle, WA 98104. (206) 447-1696.*

☐ **THE MUSIC SOURCE** (Seattle, Washington), formerly The Music Farm, has remodelled and installed a new MCI JH-600 Series 24-track console to complement the facility's MCI JH-116 24-track recorder. Acoustic design engineers **Towne, Richards, and Chaudiere** were consulted on the remodeling of the studio. The music room now features a Live-end/Dead-end acoustic design. Future plans call for the addition of video sweetening capability. Partners in the venture are **Jim Wolfe,** the original owner, and **Dave Rayner** and **Bob Israel.** *615 East Pike Street, Seattle, WA. 98122. (206) 323-6847.*

— NORTHWEST ACTIVITY —

BEAR CREEK STUDIO (Woodinville, Washington) has seen **Pam Moore** working with producer **Art Ford** and engineer **Tim Killeen; Bell & James** doing demo work; and composer/producer **Joe Hadlock** as he continues ad production. *6313 Maltby Road, Woodinville, WA 98072. (206) 481-4100.* ■ **THE NOVA MUSIC GROUP** (Seattle, Washington) finds **Daryl and Renee Redecker** finishing work on their fifth album; **Tall Timber** working on their next LP, featuring national fiddle champion **Vivian Williams;** and **Jumi Emizawa** completing several demos for Japanese exposure. **Paul Speer** produced all the projects, with engineering by **Larry Nefzger, Dekek Du Nann, Dave Raynor, Bob Israel,** and **Bill Stuber.** *1001 4th Avenue, Suite 3618, Seattle, WA 98154. (206) 447-*

STUDIO UPDATE

NORTHWEST ACTIVITY . . . continued —

1696. ■ **SOUND SMITH STUDIOS** (Portland, Oregon) reports that **Pat O'Hearn,** bassist for the Frank Zappa Band, is in working on an album co-produced by **Mark Isham** and **Terry Layne;** original music for the Independent Photo Journalist's Pacific Outdoors TV show with Layne in the booth; and demo work for **Patrick Smid** and **Jerry Alderman.** *426 North West Sixth Avenue, Portland, OR 97209. (503) 224-7680.*

Hawaii:

☐ **THE WINERY RECORDING STUDIO,** (Haiku, Maui, Hawaii) is a fully equipped 24-track studio that features an API console customized by Deane Jensen, a custom modified Ampex MM-1100 recorder, and an Ampex 440-C mastering machine. Signal processing gear includes Lexicon Prime Time DDL, dbx 161 compressor/limiters, an Eventide Instant Phaser, Omnicraft noise gates, and AKG BX-10 reverb. Monitors are by JBL, Auratone, and Altec, powered by Crown and BGW amps. The mike list boasts units by AKG, Shure, Sennheiser, Neumann, and Sony. An ARP 2600 synthesizer is offered, as are a Clavinet, a Pro Solist, and a variety of guitar amps. *240 Kaupakalua Road, Haiku, Maui, HI 96708. (808) 572-1560.*

— HAWAII ACTIVITY —

■ **THE WINERY RECORDING STUDIO** (Haiku, Maui, Hawaii) is working with Doobie Brothers sax player **Cornelius Bumpus** as he tracks a single set for mixing in the studio; guitarist **Bob Bangerter** of **Street Talk** recording a single with producer **Tim Carroll;** and **Firefall** and **Pure Prarie League,** providing sound reinforcement for their appearance at the Royal Lahaina's Stadium. *240 Kaupakalua, Haiku, Maui, HI 96708. (808) 572-1560.* ■ **SEAWEST RECORDING STUDIOS** (Honolulu, Hawaii) reports that **The Doobie Brothers** are in tracking back-up vocals; **Robin Childs** doing master mixing on an album; and master mixing on **TKO's** next album is proceeding with **Rick Keefer** at the board. *P.O. Box 30186, Honolulu, HI 96820. (808) 293-1800.*

Canada:

☐ **MUSHROOM STUDIOS** (Vancouver, British Columbia) has installed a custom console, which utilizes all-tube amps from the studio's previous board, is equipped with 48 channels, and features a 40-channel monitor panel. Construction has also been completed on a new temperature-controlled, acoustically adjustable piano room, which houses both a Yamaha C-7 grand and a Fuehr & Stemmer upright grand. *1234 West 6th Avenue, Vancouver, B.C., Canada, V6H 1A5. (604) 734-1217.*

— CANADIAN ACTIVITY —

EVOLUTION 2000 SOUND STUDIO (Brampton, Ontario) recorded location dates for **Adam and the Ants, The English Beat, Tom Verlaine, Martha and the Muffins,** and **Roy Buchanon.** *334 Rutherford Road South, Unit 14, Brampton, Ontario, Canada, L6W 3P5. (416) 453-4626.* ■ **MUSHROOM STUDIOS** (Vancouver, British Columbia) hosted Spokane band **Lion** as they tracked original material for a debut album engineered by **Keith Stein.** *1234 West 6th Avenue, Vancouver, B.C., Canada, V6H 1A5. (604) 734-1217.* ■ **COMFORT SOUND RECORDING STUDIO** (Toronto, Ontario) saw the cast of **Beatlemania** to record demos of original material between performances at the O'Keefe Centre, while the 16-track remote unit was out tracking **Burton Cummings** and **Todd Rundgren** for the first two programs of a live television concert. *2033 Dufferin Street, Toronto, Ontario, Canada, M6E 3R3. (416) 654-7411.*

Japan:

☐ **KOHGAKUIN STUDIO NUMBER 3** (Tokyo, Japan) has taken delivery of a Melkuist GT-800 console automation system. The package, purchased from Nissho Electronics Corporation, will be interfaced with a 32-input Trident Series 80 console featuring a Valley Audio Fadex fader package. *Tokyo, Japan.*

Caribbean Area:

☐ **PARADISE ALLEY STUDIO** (Barbados, West Indies) has opened a new 24-track recording facility, which features an Otari MTR-90 recorder, Tangent 32/24 automation-ready console, Lexicon 224 digital reverb, Eventide H-946 Harmonizer™, Trident limiter/compressors, Roger Meyer gates, and Altec 604-8H monitors powered by Crown amps. Microphones are by Neumann, Sennheiser, AKG, and Shure. The facility is owned and operated by the Barbadian band, **Ivory**. **Roger Rhodes** acted as studio consultant. *Caribbean Pepperpot, Saint Lawrence Main Road, Christ Church, Barbados, West Indies. c/o (212) 245-5045.*

☐ At **COMPASS POINT STUDIOS** (Nassau, Bahamas) **Robert Palmer** is producing **Mood Martin's** album for Capitol Records; **Barry Reynolds'** own album is in the mixing stage with **Alex Sadkin** producing (backing Reynolds are the **Compass Point All Stars,** including **Sly Dunbar** and **Robbie Shakespeare**); **Steven Stanley** is producing his own record; and **Roxy Music** is recording a new album for E.G. Records/Warner Brothers. *Nassau, Bahamas.*

— *AUDIO/VIDEO UPDATE* —

Eastern Activity:

☐ **METROPOLIS STUDIOS** (New York City) which, it is claimed, will be one of the largest integrated audio/video facilities on the East Coast, has projected late 1982 for its opening, according to **Alex Major,** company president, and **John Storyk,** the studio's executive vice-president. The facility will be housed in the old Metropolis Building, in the heart of New York City's West Side television, film and sound recording district. It will feature four shooting stages, and a large video/audio shooting theater. The new operation plans to offer complete video, audio, and film production and post-production, including a film dubbing theater, screening theater, and complete ancillary support services. All the areas of production will be tied together via computerized digital technology. *59th Street at 10th Avenue, New York, NY 10019.*

☐ **VIDEOSMITH** (Philadelphia, Pennsylvania) has updated its offline editing suite and travelling edit pack with the addition of new Sony BVU-800's, which allow a one-inch-like tape handling in the ¾-inch U-matic format. Another set of 800's soon will be available in the on-line CMX edit suite, and an Otari MX-5050 stereo machine has been installed in the one-inch editing bay for audio sweetening. The one-inch facility features Sony BVU-1100 machines interfaced with a Quantel 5000. Staff additions at the facility include **Mark Forker** as post-production supervisor, **Thom Goertel** to the post of marketing representative, and **Carol August** as an assistant director. Videosmith recently finished work on two spots for WCAU News in Philadelphia, one of which featured **The Spinners.** *2400 Chestnut Street, Philadelphia, PA 19103. (215) 864-0658.*

☐ **MORRISOUND RECORDING** (Tampa, Florida) supplied concert sound reinforcement and a separate audio feed during the video taping of a concert recorded for a television pilot. **Jim Morris** handled the live mix, while **Tom** and **Laurel Morris** ran the simultaneous 8-track mix from the MorriSound control room. *P.O. Box 17234, Tampa, FL 33682. (813) 962-4197.*

☐ **BLUE ROCK RECORDING STUDIO** (New York City) has joined forces with **Michael Shavelson,** president of Close Shaves Video Productions, to offer both audio and video services. Blue Rock's past audio/video experience includes **The Kink's** *One For the Road,* while Shavelson has had many years in the record industry. He involved a number of artists with video, including **South Side Johnny** and **The Asbury**

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STUDIO UPDATE

AUDIO/VIDEO UPDATE

continued . . .

Jukes, and **Mother's Finest.** Shavelson's productions include the first **Cheap Trick** video presentation, such shows as *Video Radio,* and *Cable Rock.* **Eddie Korvin** is the president of Blue Rock, and an Emmy nominee for his music for the NBC documentary, *This Was America. New York, NY. (212) 925-2155.*

☐ **NATIONAL VIDEO CENTER AND RECORDING STUDIOS** (New York City) was the venue for video taping of Elizabeth Swados' *A Dream, A Tune, A Letter,* created exclusively for CBS Cable. The play is a musical adaptation of works by Mark Twain, Grace Paley, and Delmore Schwartz. The production was taped in National's 4,000 square foot, 24-track "big band" studio on 47th Street, with audio engineer **Roy Yokelson** handling the final mix using the 24-track audio synced via an Audio-Kinetics Q-Lock 2.10 to a ¾-inch video cassette. Swados co-directed the program with **Merrill Brockway.** The company also recently took delivery of a Q-Lock 3.10 system, allowing two different audio machines to be enslaved to a video master. *47th Street, New York, NY.*

☐ **THE WORKSHOPPE RECORDING STUDIOS** (Douglastown, New York) provided audio facilities for the video taping of **Jan and Dean** from My Father's Place in Roslyn, New York. The production was directed by **Andy Miller** and produced by **Marcee Abramson. Dean Torrance** and keyboardist **Gary Griffin** are currently in the studio sweetening the tape, which included a guest appearance by **Flo and Eddie.** *40-35 235th Street, Douglastown, NY 11363. (212) 631-1547.*

☐ **MCPS** (New York City) announces the appointment of **Christopher Martinez** to the position of chief audio engineer for their video facility, The International Production Center. Martinez will be performing a wide variety of video services in addition to his responsibilities for the design, operation, and maintenance of the Production Center's audio system. *514 West 57th Street, New York, NY.*

☐ **VIDEOWORKS** (New York City) has contracted **East Coast Video Systems** to design and install a state-of-the-art one-inch video tape post-production operation at its Manhattan facility. Hardware will include four Sony BVH-1100A VTR's a Sony BVE-5000 video tape editor, CDL-480-8 video switcher, NEC DME digital effects unit, and stereo sound capabilities. *24 West 40th Street, New York, NY.*

☐ **THE VIDEO MUSIC GROUP** (Miami, Florida) is the recently formed association of **Criteria Recording Studios** and **Video Tape Associates,** of Hollywood, California. Using Criteria's remote truck and VTA's mobile video gear, the company recently recorded **Ahmad Jamal** live at Bubba's in Fort Lauderdale. **Mack Emerman** engineered for Criteria, while **Ken Chambliss** supervised the shoot for VTA. Post-production was done at VTA's facility in Hollywood. *Miami, FL.*

☐ **CENTER CITY VIDEO** (Philadelphia, Pennsylvania) features a wide array of video services, including an on-site studio and sound booth, location and post-production facilities, and in-house tape transfer. Equipment includes CMX computer editing with paper punch readouts, a Grass Valley quadruple re-entry switcher with special effects generator, a Chyron IV character generator, three RCA Type-C one-inch machines with dynamic freeze frame, and two RCA TR-600 two-inch quad recorders. *1503-05 Walnut Street, Philadelphia, PA 19102. (215) 568-4134.*

Central Activity:

☐ **MUSIC CITY MUSIC HALL** (Nashville) was the site of audio pre-records for **Loretta Lynn's** television special, *The Lady and the Legend,* which also featured **Sissy Spacek, Crystal Gale,** and **Howard Hessman.** *25 Music Square East, Nashville, TN 37203. (615) 244-1060.*

☐ **SCENE THREE** (Nashville) recently taped **Loverboy** on location for "Gangs in the Streets," one of three music video productions from the group's album *Get Lucky,* with **Arnold Levine** of CBS Records, and **Marc Ball,** Scene Three director/cinematographer. The intricate sequence consisted of a series of dolly moves revealing the "street gang" image portrayed by the lyrics, through dimensional group shots and individual close-ups. **Barry Ralbag** of CBS was the promo's producer. *1813 Eighth Avenue South, Nashville, TN 37203. (615) 385-2820.*

☐ **OMEGA AUDIO** (Dallas, Texas) recently supplied its 24-track mobile unit for the video taping of a network country music special staged at Billy Bob's in Fort Worth, and starring **Merle Haggard**, **Donna Fargo**, **David Frizell** and **Shelly West**, and **George Strait**. The program was recorded 24-track with time code for remix in conjunction with **Trans-American Video** of Los Angeles. Engineering was by **Paul Christenson**, **Jim Fox**, **Russell Hearn**, and **Ken Paul**. The Omega truck was also used in the video taping of a cable television pilot at Nick's Uptown in Dallas, featuring **Carl Perkins** and **Joe Ely**, with video handled by Clearwater Teleproductions of Dallas; and at a video shoot of **Vince Vance and the Valients** at Whiskey River in Dallas. *8036 Aviation Place, Dallas, TX 75235. (214) 350-9066.*

☐ **CLEARWATER TELEPRODUCTIONS** (Dallas, Texas) has formed an association with **Omega Audio**, and **Video and Post Transfer, Inc.**, consumatet with a successful location shoot at Gilley's Club in Pasadena, Texas. Clearwater president **Giles McCrary, Jr.** looks forward to supplying cable firms with video presentations having first-class audio quality. The shoot at Gilley's involved five CEI cameras, two Ampex Type C, 1-inch video tape machines, a crane, a Fisher dolly, and time code interlock with the Omega Audio multitracks via a BTX SMPTE time code computer used for remix to video. Video post production was handled by **Video and Post Transfer**, which also offers a Rank Cintel spot scanner and full CMX editing. *Dallas, TX. (817) 265-8133.*

***Clearwater** shoot at Gilley's Club, Texas*

Western Activity:

☐ **THE VIDEOGRAPHY COMPANY** (Venice, California) has produced a video album designed for home software release, featuring **The Chuck McDermott Band** in both live concert and concept video segments integrated via special effect. Segments on the album were directed by **Michael Schultz**, **Dan Lindquist**, **Steve Dollinger**, **Chuck Cirino**, **Royce Steele**, and **Price Pethel**. **Maurice Leach** co-produced the venture, as well as engineering the music. **Shannon O'Neill** produced the music, while **Mike Hill** acted as video producer. The concert Sequences were taped before a live audience with interlocked 24-track audio in the firm's studios. Videography also recently completed two promos for **Earth, Wind, & Fire**, directed by Schultz. *8928 Ellis Avenue, Venice, CA (213) 204-2000.*

☐ **RUGGLES-REBER & ASSOCIATES** (Los Angles) has produced a "high-tech" audio/video project featuring live performances of **Rob McConnell** and his 22-piece Boss Brass from Toronto, Canada. The project is a joint venture of Ruggles-Reber, PBS, Schulman Video Services, Inc., and Oak Communications, Inc. (ON-TV). The jazz band was recorded using six Ikegamie cameras, five Ampex VTR II-B video recorders, and three digital audio systems. *4324 Promenade Way, Suite 311, Marina Del Rey, CA 90291. (213) 822-3189.*

***Sound Smith Studios**, Portland*

☐ **HORIZONTAL EDITING STUDIOS** (Burbank, California) acted as post-production facility for the editing of two promotional videotapes of the **Jefferson Starship**. The promos were co-produced by **C.D. Taylor** of C.D. Taylor Film Design, and **Rod Dyer**. The two pieces, "Find Your Way Back" and "The Stranger" were off-line edited on Horizontal's ¾-inch Datatron system. On-line editing took place in their one-inch suite, using their new Commander II editing computer and Central Dynamics switcher. 2625 West Olive Avenue, Burbank, CA 91505. (213) 841-6750.

☐ **SOUND SMITH STUDIOS** (Portland, Oregon) has opened a video sweetening facility designed by **Tom Gandy** using Energy Time Curve Analysis. The main feature of the operation is the BTX Shadow system for interlock and editing purposes. A BTX SMPTE Interlock system, Ampex MM-1200 24-track, JVC 6600 ¾-inch VTR, Sony video monitor, and Nagra IV portable complete the equipment list. *426 North West 6th Avenue, Portland, Oregon 97209. (503) 224-7680.*

news

JVC CUTTING CENTER INSTALLS EXCLUSIVE CUTTING SYSTEM

Developed by the Victor Company of Japan, the system is comprised of the CA-90 driving amplifier and the CH-90 cutter head, which is said to deliver lower distortion, greater channel separation, and wider dynamic range than any other head on the market. Tom Nishida, vice president, explains that the system was developed to live up to the severe demands of digitally mastered tapes; not surprisingly, it offers significant benefits for conventional master tapes, too.

Extensive research and development went into this new cutting system, partly motivated by JVC's involvement as a manufacturer of state-of-the-art digital tape recording/editing/mastering equipment, and also by the need for better real-time cutting of analog tapes. Up to now, some perceived anomalies in digitally mastered disks may actually have been caused by deficiencies in the cutting chain. Because digital recorders are optimized for playback in real-time, half-speed cutting was not a viable option for improved quality. JVC's new CA-90 system delivers half-speed quality, or better, at normal speed, so it does an outstanding job with digital masters.

AUDIOTECHNIQUES/MCI TECHNICAL TRAINING SEMINAR

From February 1st to 3rd, 1982, Audiotechniques, in cooperation with MCI, will present a three-day seminar at the New York Hilton, in New York City. Engineering and technical personnel from MCI will cover aspects of the operation and maintenance of MCI tape recorders and consoles.

Presentations will be hightlighted by audio-visual shows covering Signal and Logic Flow. All participants will receive complete MCI manuals for each session taken, and certificates will be awarded upon completion of the seminar.

Prices for the seminar range from $75.00 to $150.00.

For further information and reservations, contact: Bob Berliner, Audiotechniques, 652 Glenbrook Road, Stamford, CT 06906. (800) 243-2598.

QUAD-EIGHT DELIVERS SECOND AUTOMATED SYSTEM TO NBC

The second of two disk-automated Coronado editing systems will be installed in NBC's new video sweetening studios, in Burbank, California, scheduled to begin operation early in 1982.

Each system uses Quad-Eight's automated, 40-input Coronado console and proprietary Compumix III® software package, and includes dual disk drives, color graphics terminal and Compumix® editor computer. Using SMPTE time based synchronization, the Quad-Eight system provides a powerful tool for audio enhancement, with mix editing accuracy down to a single video frame.

SENNHEISER DELIVERS 300,000th MD-421 MIKE

The MD-421 is a high-quality dynamic microphone used for recording, as well as broadcast and sound reinforcement.

According to Tony Tudisco, Sennheiser's national sales manager: "In this market when manufacturers must change their models frequently to meet the needs of our industry, it is gratifying to see a product with such longevity. Three hundred thousand of any microphone is incredible. When one considers this is a professional and not a consumer product, it is a major feat," he concluded.

SCHARFF OFFERING AUDIO-FOR-VIDEO RENTAL SYSTEMS

According to Peter B. Scharff, president of Scharff Communications, Inc., SCI can now provide full rental facilities for multitrack recording or live broadcast feeds; everything from system design, trucking and installation to on location set-up and maintenance. The unique plan is said to provide SCI clients access to the full array of equipment in the firm's rental inventory, to be used in various configurations depending on client needs.

A new Harrison MR3 36/24 mixing console, purchased from Martin Audio Video Corp., is the heart of the SCI plan. SCI has also purchased an Ampex MM-1200 16/24-track recorder, along with new communications, distribution and SMPTE interface hardware.

The MR3 console is said to possess many features that are easily adaptable to the needs of video producers. For example, a "fader reverse" feature allows an engineer to control the two-track video feed on the board's main faders. In addition, SCI has modified the MR3's VCA grouping feature to include "supergrouping," giving the mixer control of multiple groupings on one fader.

Like father, like son.

For roughly $10,000, you can own the ultimate analog mastering deck—the Studer A80RC half-inch two-track recorder.

Beyond your budget? Well, for about 1/5 the price you can own a Revox PR99 compact professional recorder. It's made by the same company, it draws on the same wealth of engineering expertise, and it reflects the same philosophy of design and construction—a philosophy established by Willi Studer over three decades ago.

The PR99's bloodlines are evident in every detail...in the precision-machined headblock, the rugged die-cast chassis, the servo-controlled capstan motor, and the Studer-made heads. Professional design features include a flat faceplate for easy head access; edit switch to defeat tape lifters and fast wind latching; tape dump button; balanced XLR inputs and outputs switchable for calibrated or uncalibrated mode; and two-way self-sync with auto input switching. The PR99 may be ordered with 3¾-7½ or 7½-15 ips tape speeds. Vari-speed, full remote control, and monitor panel available as options.

The PR99 now comes in console, rack mount and transportation case versions. Check it out. Call or write today for the location of your nearest dealer.

The PR99. From the world's most respected name in recording.

STUDER REVOX

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SM85

a studio quality condenser microphone that's not "studio bound"

This new high technology Shure microphone will change the way people think of condenser microphones. The SM85 is designed especially for on-stage, hand-held use. Its sound is unique—far more tailored to the special needs of the vocalist: sizzling highs and a shaped mid-range for superb vocal reproduction, and a gentle bass rolloff that minimizes handling noise and "boominess" associated with close-up use. Ultra-low distortion electronics make the SM85 highly immune to stray hum fields. An integral, dual-density foam windscreen provides built-in pop protection.

What's more, the SM85 Condenser Microphone must pass the same ruggedness and dependability tests required of Shure dynamic microphones. As a result, the SM85 sets a new standard of reliability for hand-held condenser microphones.

The SM85 is *extremely* lightweight, beautifully balanced—it feels good, looks good on-stage, on-camera, on-tour. Ask your dealer for a demonstration of the new SM85, or write us (ask for AL664) for full details.

SM85

Cardioid Condenser Hand-Held Professional Microphone

The Sound of the Professionals

SHURE®

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Manufacturers of high fidelity components, microphones, sound systems and related circuitry.

For additional information circle # 121