

Don Felder

MODERN

RECORDING

& MUSIC

MAY 1984 VOL. 10 NO. 5 \$1.95



HEART / KANSAS LIVE!

RECORDING TECHNIQUES:

Recording The Spoken Word

MUSICIAN'S

NOTEBOOK:

Sequential Circuits' Prophet-T8

ADVICE:

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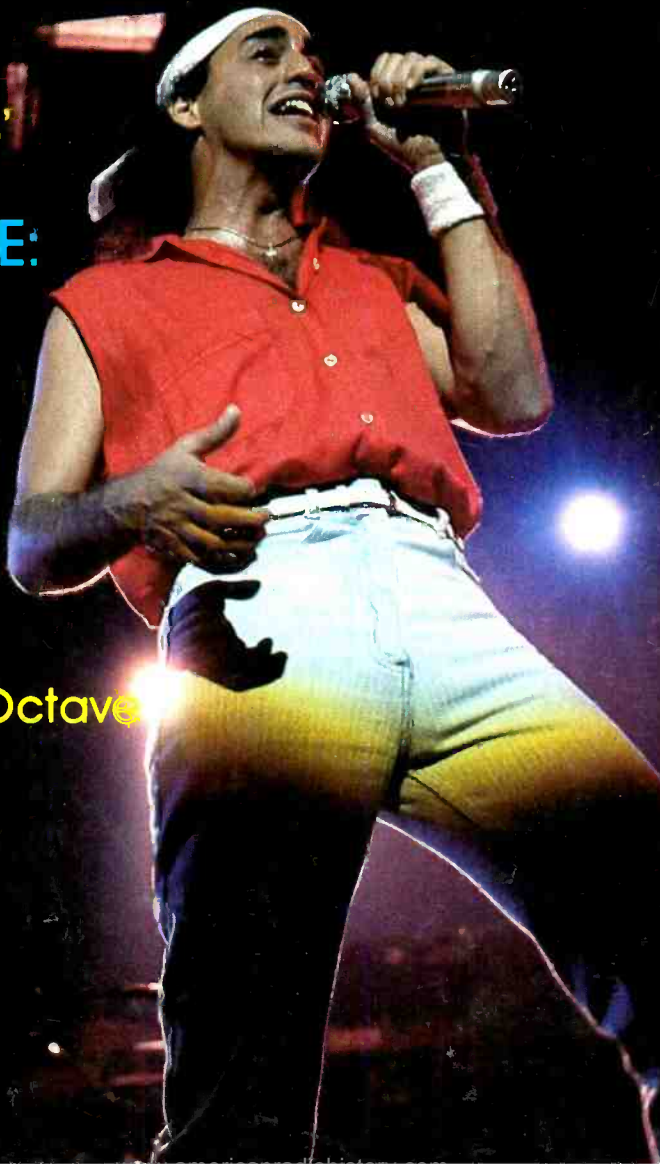
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MODERN RECORDING & MUSIC

FEATURES

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by Bruce Bartlett

Many recording engineers find work at studios recording speech rather than music. This month, Recording Techniques covers the most effective way of recording the spoken word.

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by Eric M. Berman, Esq.

Songwriters negotiating a deal should be extremely careful to insure that as many of their rights are retained as possible. In his second article of this series, Mr. Berman discusses the various performing rights organizations.

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by Sam Borgerson

The recent Heart/Kansas show in Nashville promised to be quite an event—especially to recording engineer Guy Charbonneau. For Mr. Charbonneau, owner of le Mobile remote truck, the double bill meant working twice as hard to get a customized mix for each band.

30 DAVID SANBORN

by Gene Kalbacher

David Sanborn has become perhaps the most in demand alto sax player in the business. He's played on albums by the Rolling Stones, James Taylor and David Bowie. He has also released numerous solo LPs, but it wasn't until he began to feature his own compositions that his albums hit the top of the charts.

34 DON FELDER: FLYING SOLO

by Vicki Greenleaf

Former Eagle Don Felder recorded and produced his recent solo LP in a studio he had built in the guest house of his Malibu estate. Working alone has been a worthwhile change for this ex-Eagle. Here, he talks freely with *MR&M* about his past with the Eagles, as well as his recent solo projects.



SOUND IDEAS

HACKER'S DIGEST

by Ken Pohlmann

Whether you like it or not, sooner or later the computer is going to become part of your life. In this new column we introduce you to the many aspects of modern computing, especially how it relates to the recording industry.

SOUND ADVICE

by Susan Borey

This month—a description of the types of cords, cables, and connectors, plus various do-it-yourself methods to maintain a good quality collection.

MUSICIAN'S NOTEBOOK

by Craig Anderton

The Sequential Circuits Prophet-T8.

AMBIENT SOUND

by Len Feldman

In this installment Mr. Feldman examines the impact of the Zenith system of transmission and the dbx system of companding on the recording industry.

LAB REPORT

by Len Feldman

The Carvin EQ2029 1/3 Octave Equalizer.

DEPARTMENTS

LETTERS TO THE EDITOR

TALKBACK

The technical Q and A Scene.

MARKET PLACE

What's new in sound and music.

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& MUSIC

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Is This Stuff Tough?

I have become interested in PAIA electronic kits. Could you please tell me the degree of difficulty in building one of these kits? I have a moderate knowledge of electronics but am unable to follow schematic diagrams. Also, could you please tell me the address of PAIA and if there is a catalog of kits available?

—Robert Blaser
Hales Corner, WI

The PAIA electronic kits come with a fairly comprehensive instruction manual. In theory, as long as you can follow instructions clearly, you shouldn't have much trouble. We do recommend keeping on hand a copy of Craig Anderton's Electronic Projects for Musicians, published by Guitar Player Books, a division of Music Sales. It should get you through some of the more complicated construction problems. In addition, PAIA has a technical services department that will troubleshoot over the phone or by mail. PAIA informs us that if you purchase the kit, read the manual and feel it's too complicated, you can return the unbuild kit.

There is a catalog of kits available. To receive a copy just write to:

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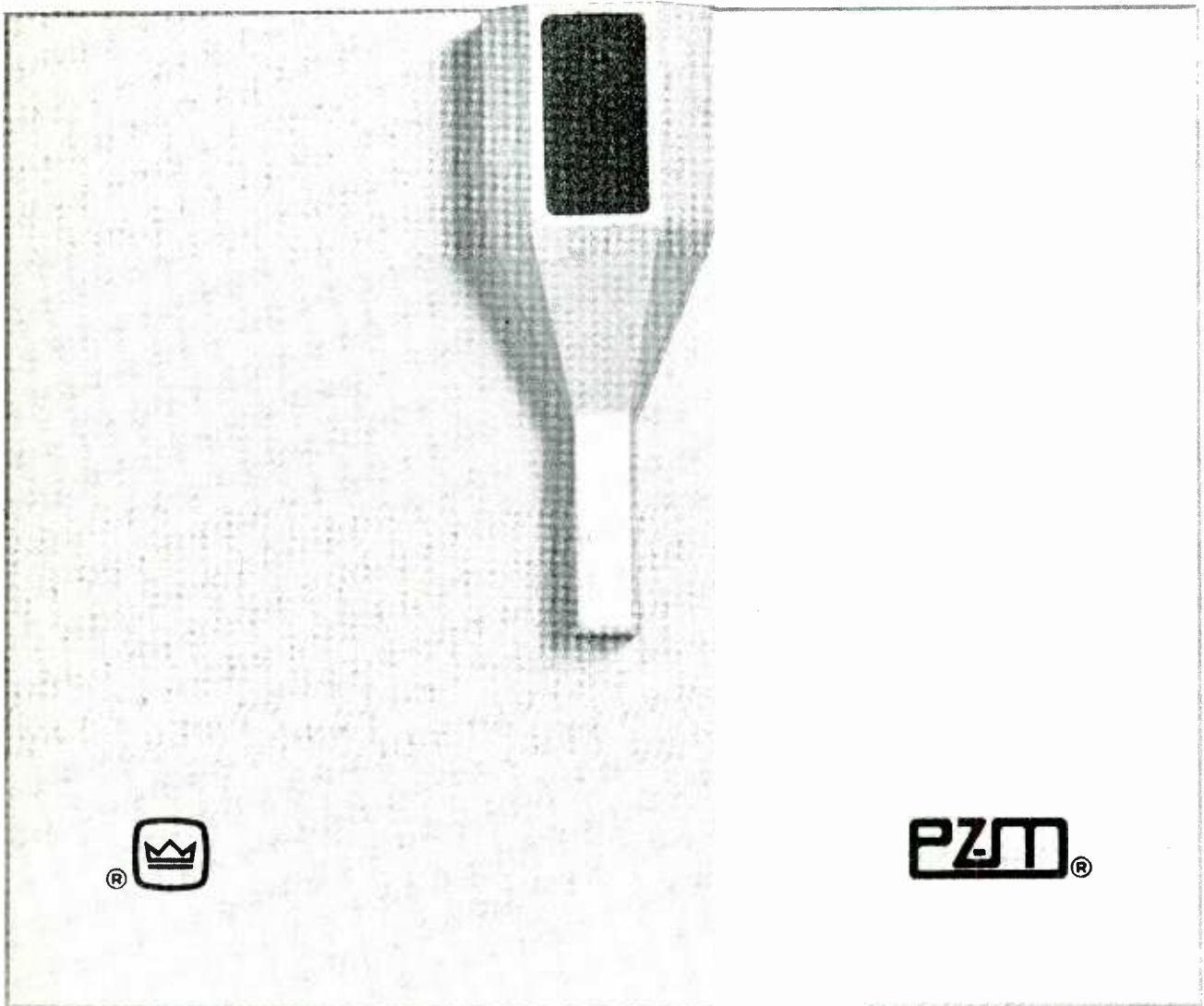
A Cheesy Chorus

I read with interest Bruce Bartlett's column on delay units in the February *MR&M*. It was informative to many people not familiar with working with time delay. I do, however, have one disagreement with the article. On page 13 he states (under the 15-35 msec heading) that when regeneration is used with this delay, "the effect is called 'chorus,' and sounds like many voices." In effect, however, what happens when you add regeneration to these delay settings is a reverberation effect, and a rather cheesy reverb at that. In extreme settings, this is called "bathtub reverb" and especially happens at longer delay settings up into the slapback range.

To achieve the chorus effect, there must be some frequency modulation in addition to the delay setting. This is because when a real chorus (of people) sing, they use vibrato in their voice. This makes the pitch waver (frequency modulation) and they don't say the words at exactly the same time, which accounts for the time delay. When this sound is simulated electronically, regeneration can be added to help add extra fullness but is not essential. The delay and the modulation are the key components for the chorus effect.

—Vince Motel
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This space contributed as a public service.

We received the following reply from Bruce Bartlett:

Thanks for the information, Vince. In my first article on signal processors (Dec. '82 issue). I said that, with doubling or chorus, "the delay should be randomly varied for the most natural sound." But even if the delay is varied, without regeneration you still hear only two voices (the direct sound and its delayed repetition). I'd call this "doubling" or "automatic double tracking" rather than "chorus." A chorus is more than two voices. So, to obtain a chorus effect, a little regeneration—or a second delay tap—is needed. This is a minor technical distinction and is hard to hear anyway.

What's used in chorusing is time modulation (varying time delay). This simulates the way a group of people attack notes at different times. They supply their own vibrato, so the delay device doesn't need to add it (unless desired).

Time modulation causes frequency modulation (pitch bending) as a side effect. That's because frequency = cycles per unit of time. If the unit of time varies, so does the frequency. This produces a wavy or shimmering effect that many would call "chorus," whether or not regeneration is used.

There is at least one record available (at no cost) that demonstrates various delay and reverb effects.

Many readers should find it helpful. It is put out by LT Sound, P.O. Box 338, Stone Mountain, Georgia 30086.

Thanks!

To The Editor:

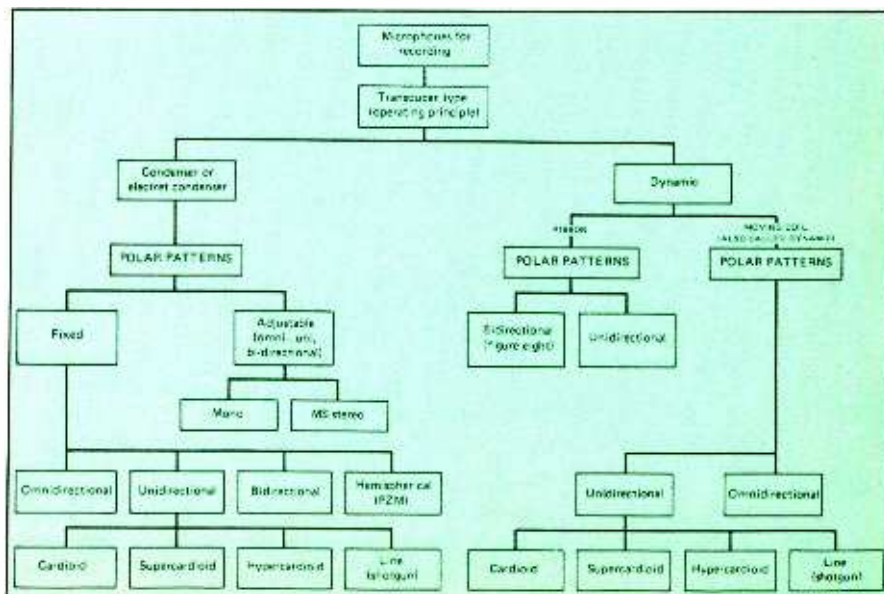
Just a note of thanks for the interview with me you recently published. Erin Morris did an excellent job, and I believe her article will be helpful for Sound Emporium.

Jim Williamson
President
Sound Emporium, Inc.

Whoops!

It's happened again. We've (believe it or not) made an error. (We do this to keep you on your toes and to make sure you're reading the magazine.) The latest gaffe took place in Bruce Bartlett's March Recording Techniques column (p. 11, Figure 2). Some of the microphone categories on the right-hand side were incorrectly identified. The correct diagram appears below.

Our apologies for any confusion this may have caused. Be assured, the guilty party has been dealt with. (Look forward to a feature on Recording Studios in Outer Mongolia coming soon.)



JOE GOTTFRIED ON FOSTEX

Joe runs Sound City where groups such as Tom Petty and the Heartbreakers, Fleetwood Mac, the Beach Boys and Barry Manilow have recorded. Joe also runs Carman Productions and has managed artists such as Rick Springfield, Gus Hardin, William Katt, Jaye P. Morgan and Theresa Brewer.

“As a studio owner, I encourage artists to use our Fostex equipped Rehearsal Studio to work out creative ideas—to compose and arrange—as well as production ideas—the sequence in which the various parts will be recorded.

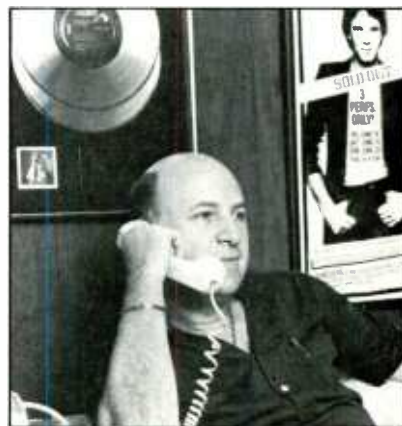
“It’s getting a little scary with regard to the sound quality of these Fostex demos. I hear mixes through a very expensive studio playback system, and it’s very difficult to fault the fidelity of the Fostex-made tapes.



“As a manager, just because we also represent a major recording studio doesn’t mean

we want the acts we represent to go in there and waste a lot of time and a lot of dollars. We like, and we like the people we represent, to make money. And you don’t make it if you spend it all in the studio.

“Fostex is great because it’s so efficient. It’s time, it’s money,



it’s creative freedom. As important as anything else is the fact that artists save time creatively. When you’re not tired creatively, your juices are flowing. And you get a better product.”

A handwritten signature of Joe Gottfried in black ink, written in a cursive style.



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Talk Back

Close That Gate

About three years ago, I ordered four pairs of kits of audio devices from Bill Godbout Electronics. I bought a copy of Craig Anderton's book, *Electronic Projects for Musicians*, and was looking forward to some great effects.

When it came time for testing the kits (prior to mounting them in enclosures), I came upon a problem with two noise gates. The problem is they don't "gate." The reduction control works but the threshold control has no effect. They both stay in the open mode no matter what the setting of the threshold. I've exhausted my knowledge of electronics attempt-

ing to troubleshoot these kits. Can you help?

—John Mayes
St. Albans, West Virginia

We received the following response from Craig Anderton.

Several people have described the exact same problem you have. In every case, the solution was one of two things: either the opto-isolator was inserted or soldered incorrectly, or the transistor was installed incorrectly. Note that not all transistors have identical lead bases—some of the ones in the Godbout kits were surplus, and often a small sheet of paper was included in the kit giving the base diagram. Something like

that can easily get lost in three years.

Hope this helps. Good luck with the noise gate. There are no known design or production errors with the kit.

Right Answer, Wrong Question

In response to Craig Anderton's reply to Mr. Montella, Jr.'s question in the January 1984 Talkback regarding translating between "+4 and -10 levels," I would like to quibble.

As the question was stated, Craig's answer was entirely correct; however, the question was not stated correctly. The levels involved are +4 dBm and -10 dBV. To prevent confusion, these subscripts are essential when using dB levels. (To be totally accurate, the terminating resistances also need to be stated.) A +4 dBm signal represents a level 4 dB above 1mW into 600 ohms (assumed, but should be stated), which translates to 1.23 volts; a -10 dBV signal represents a level 10 dB below 1 volt (equal impedances assumed), which is .316 volts. Now, the ratio is 3.89, or a 11.8 dB level shift, not 14 dB as stated—a silly 2 dB difference.

Does it matter? It depends. It is a 2 dB loss in signal-to-noise ratio, and 2 dB less headroom. To the particular system involved, it may not matter, but to the ongoing task of audio education, it matters a great deal.

To correct the figures given, change the 2.7k resistor to 3.6k ohms (nearest 5 percent value, or use 3.46k, 1 percent); for the active circuit, change the 4.7k to 15k and the 22k to 43k ohms (nearest 5 percent value, or use 43.2k, 1 percent).

—Dennis Bohn
V.P. Research & Development
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Recording Techniques

bruce bartlett

Recording the Spoken Word

Although *Modern Recording & Music* is the name of this magazine, let's consider recording sources other than music. Many studios record *narration* as well—for documentary films, slide shows, educational programs, radio dramas, commercials, and books on tape.

In fact, many recording engineers find work at studios recording nothing but speech. Others start with speech recording to learn the ropes, then move on to music.

In this month's installment we'll cover ways to record the spoken word most effectively. It's not as simple as it seems!

Consistency

One of the most important qualities of a speech recording is *consistency*. The tone quality, average recording level, average pitch, and average tempo of the voice should not change noticeably throughout the recording.

Often a complete script is recorded in a single session. Then a *proof* copy of the tape is sent to the script's publisher to check for errors. After corrections are received, the announcer is called back into the studio to record *inserts* or corrected sentences and paragraphs. These inserts

are edited back into the original recording. If the sound of the inserts doesn't match the sound of the original, the listener will hear jarring changes in the voice quality as the recording plays. So it's important to duplicate the recording set-up every time the announcer is recorded.

Several factors can vary from one session to the next: recording levels, microphone choice, microphone placement, text position, announcer's position, EQ and noise reduction, even the announcer's voice itself. We need to keep all these factors constant by documenting the set-up.

Take notes on the microphone used, its switch positions (if any), and its distance and position relative to the announcer. Also note any equalization or noise reduction used (many studios just record "flat" to reduce the number of variables). You may want to settle on a standard set-up so you can record a predictable sound.

Microphones

Let's start with the microphone. Four types of microphones are commonly used for voice recording:

1. Top-quality lavalier condenser microphones;
2. Flat-response cardioid microphones (condenser or dynamic);

3. Ribbon microphones;
4. "Multiple-D" dynamic microphones.

The lavalier microphone is a miniature unit (like the TV newscasters use) that clips onto the announcer's tie or shirt. Most of the major microphone manufacturers have excellent models in the \$200 price range. Don't skimp on this microphone, or the sound quality will suffer. Since the microphone is worn by the user, it remains a constant distance from the mouth, which aids consistency. And there's no problem with breath "pops."

A cardioid condenser microphone provides a luxurious, big-budget sound—one with full lows and detailed highs. A ribbon microphone offers a warm, smooth sound.

Unfortunately, the bass response of these microphones varies with the announcer's distance from the mic. The closer the talker is to the microphone, the bassier the recording. Unless the announcer can remain a constant distance away, the voice tone quality will vary.

This close-up bass boost (called the *proximity effect*) occurs with *single-D* directional microphones. *Multiple-D* microphones are designed to compensate for proximity effects—their

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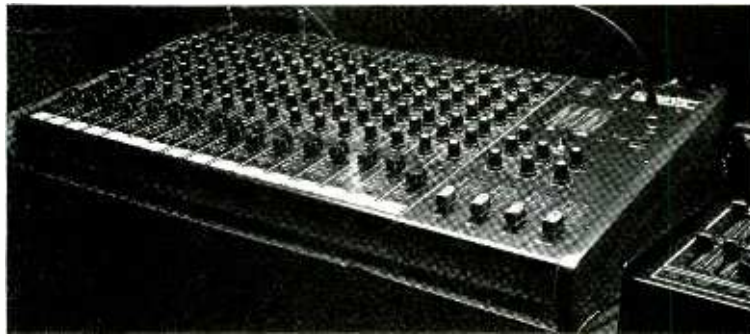
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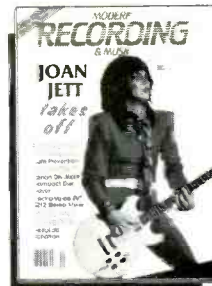
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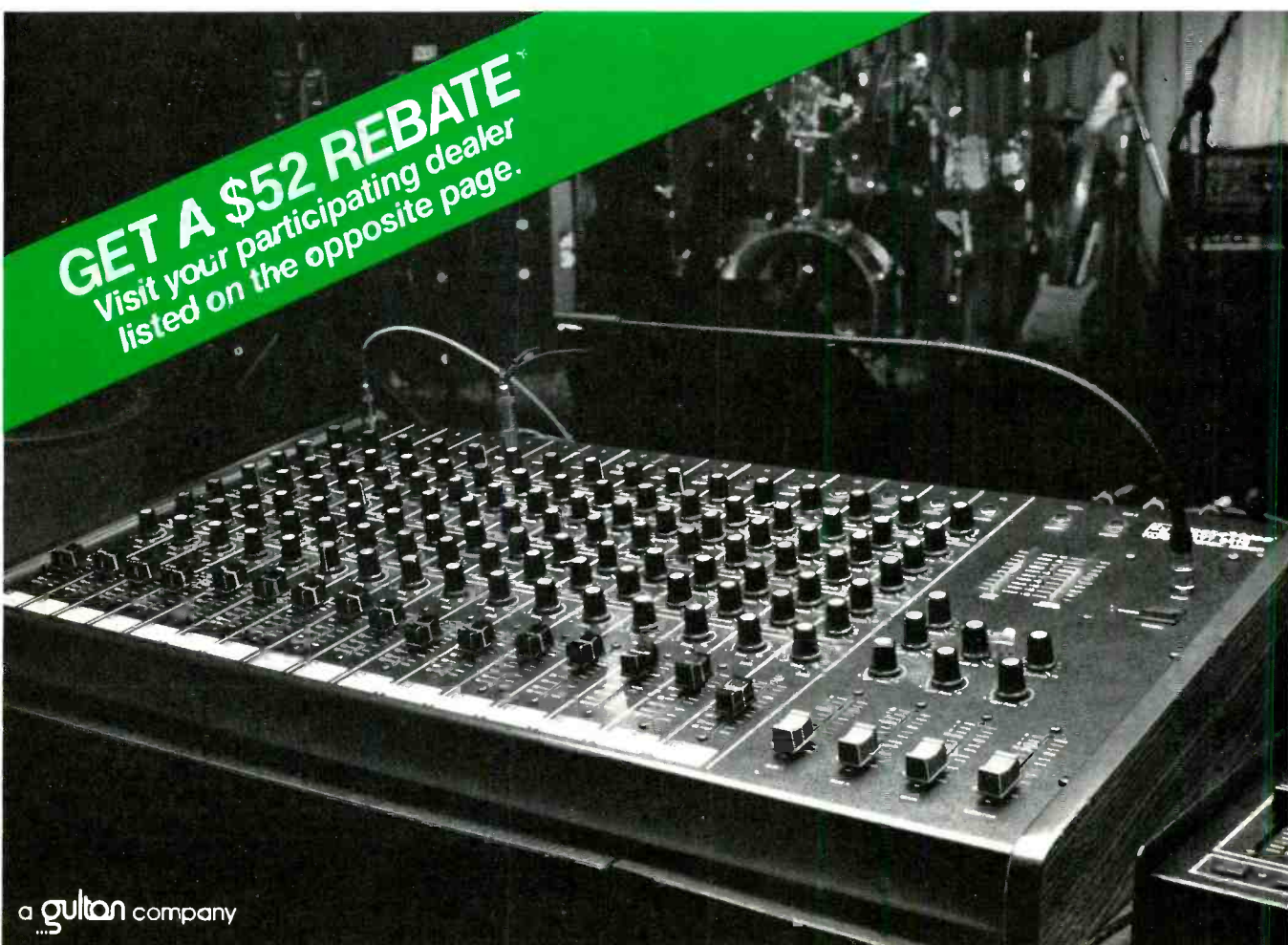
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bass response varies only slightly with distance.

Microphone Placement

It helps to standardize on a distance between the microphone and the announcer's mouth that provides the best sound quality. A typical distance might be 8 to 12 inches. Too-distant placement picks up excessive room acoustics. In general, little or no room sound should be audible in a narration recording. Too-close placement emphasizes lip and tongue noises, and allows the voice level to vary greatly with small changes in the announcer's position. Find a workable distance somewhere in the middle and stick with it. This applies to lavalier microphones, too.

An exception to this rule might occur in recording drama. There, the actors often vary mic'ing distance for special effects.

Some studios set the mic'ing distance with a spacer or ruler. Alternatively, announcers can set the spacing with their hands. They spread their fingers, place their thumb on their mouth, and place their little finger on the microphone grille.

Microphones should also be placed so as to avoid "popping." When a person says words starting with the letters p, t, or b, a turbulent puff of air is forced from the mouth. If this air puff hits a microphone grille, a little thump or explosion called a *pop* is heard in the microphone signal. Since a pop disturbance leaves the mouth within a narrow conical angle, you can prevent popping by placing the microphone above, below, or to the side of the mouth. It also helps to put a foam *pop filter* or *windscreen* on the microphone.

Mount the microphone on a boom stand and place the base of the stand on the floor. This arrangement reduces pickup of table thumps. It also helps to use a shock-mounted mic stand-adaptor (available from your microphone dealer). Many studios pad the announcer's table with cloth or foam to prevent noises.

You should also place the microphone so as to avoid picking up sound reflections from the script or the announcer's table. When these reflections combine at the microphone with direct sound from the announcer, phase interference occurs, resulting in a "filtered" tone quality. In addition, the tone quality changes when the announcer moves.

Figures 1 through 6 show several right and wrong ways to position microphones. In *Figure 1*, a lavalier microphone is used. Sound reflects off the script into the microphone, causing phase interference. But in *Figure 2*, the script is angled flatter so that reflections bounce away from the microphone.

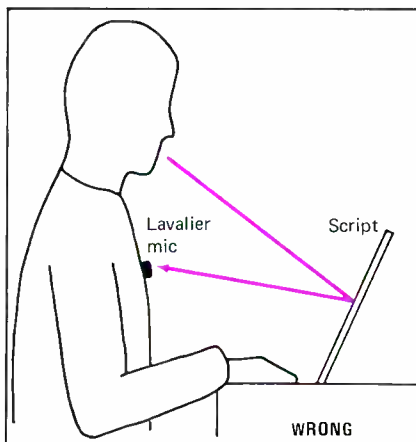


Figure 1. Sound reflects off script into microphone, causing phase interference.

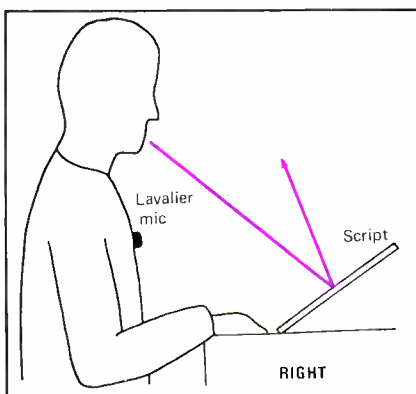


Figure 2. Sound reflects away from microphone.

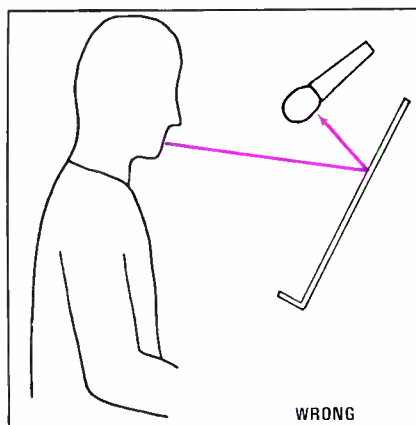


Figure 3. Sound reflects off script stand into microphone, causing phase interference.

In *Figure 3*, a cardioid microphone is improperly positioned because reflections off the script-stand enter the microphone. But in *Figure 4*, the reflections approach the "dead" back side of the cardioid microphone, and are rejected. Paper noise is reduced as well. *Figures 5* and *6* show other good methods.

If you record more than one announcer at the same time, seat them at least four feet apart to prevent phase interference between microphones.

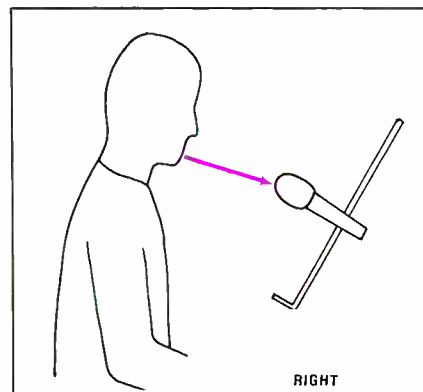


Figure 4. Sound reflects into "dead" back side of cardioid microphone.

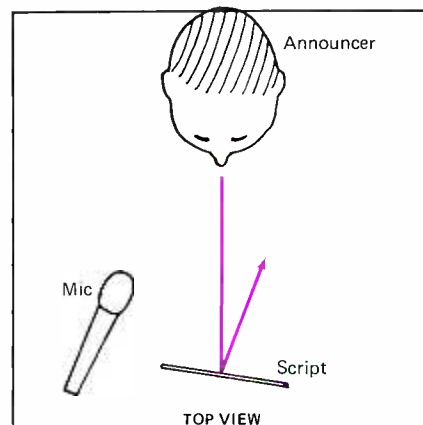


Figure 5. Sound reflects off angled script away from microphone.

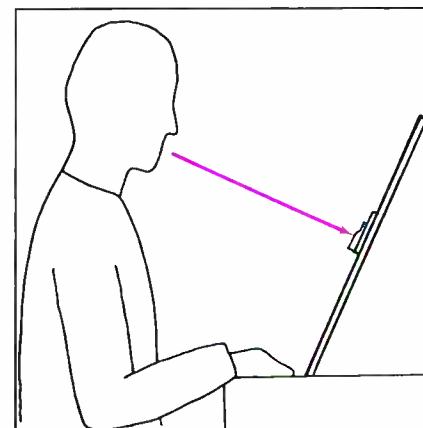


Figure 6. PZM on 2-foot-square script stand.

Controlling the Announcer's Position and Voice

To promote a consistent sitting position, provide the announcer with a comfortable, fixed-frame chair with a back. Advise the announcer to move as little as possible and not to slump over the table.

The announcer's head motion can change the recorded tone quality. Here's why: Low frequencies radiate from the mouth in all directions, but high frequencies radiate mostly straight out. So, if an announcer moves his or her head while talking, the high frequencies ("ss" sounds) may miss the microphone occasionally. This occurs with lavalier microphones also. Ask announcers to move only their eyes while reading, not their heads.

Actually, we're asking the announcer to become a frozen robot. A head-worn microphone allows more freedom of movement—it may be a useful alternative if you are satisfied with the sound and can position the microphone consistently.

The average pitch and speed of an announcer's voice can change from day to day. In fact, it even varies from the beginning to the end of a recording session. So, whenever you have to record inserts, play back some of the original tape to the announcer for voice matching. Also, let the announcer warm up by reading for a few minutes while you set the record level.

Reducing Sibilance

Another factor to keep under control is *sibilance*—the emphasis of "ss" and "sh" sounds. These sounds have strong high-frequency components around 5 to 10 kHz, which can saturate the recording tape and cause distortion. You can reduce sibilance by using flat-response microphones, mic'ing off-axis to the mouth, or cutting around 5 kHz with an equalizer.

A better solution is to use a *De-Esser*. This is a signal processor that removes excessive sibilance without affecting the tone quality. Actually, it's a compressor that boosts high frequencies before compression and cuts them in a complementary way after compression. That way, only excessive high frequencies (sibilant sounds) are compressed. To work effectively, a *De-Esser* should not be used in conjunction with another compressor.

Reducing Print-Through

A tape recording of narration may contain unwanted echoes or pre-echoes of speech during pauses between words. These echoes are called *print-through*. In the tape reel, the magnetic signal transfers or "prints" from one layer of tape to the next. This causes a repetition of the program.

Print-through is a major problem with a narration recording because speech contains many silent pauses where print-through can be heard. Here are some ways to reduce print-through:

- Use 1.5 mil tape.
- Use dbx or Dolby A noise reduction (they reduce print-through as well as tape hiss).
- Avoid recording levels above 0 VU.
- Store tapes tail out and rewind them before playing.
- Store tapes in moderate conditions of temperature and humidity.

Recording Session Procedures

Now that you've taken all the precautions to assure consistent,

clean sound, you're ready to record a script. The announcer is seated the proper distance from the microphone, with the script ready to read. Some announcers fold up the bottom corners of their script pages to form a handle for turning pages without noise.

The engineer or producer has an identical script on which to mark *edit points*—spots where the announcer misreads a sentence.

After a level check, you start recording. The announcer reads the script, and you or the producer follow along in your own script, marking edit points with a pen. You just leave the tape rolling when mistakes occur.

If the announcer misreads a word or makes a paper noise, he or she goes back to the beginning of the sentence where the error occurred, and starts over. The announcer should *not* attempt to correct the error in mid-sentence and continue through the sentence. That kind of correction is too hard to edit. It's much easier to make an undetectable tape splice if you have a long pause between words (say, between sentences).



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EDITOR'S COPY

Script For "Cosmic Order" Film

Client: Impossible Productions, Inc.

A branch consists of two or more radiations from a common point. Its basic shape is the letter "Y."

Each branch has its own branches. For example, a tree trunk branches into large limbs. Each limb branches into smaller limbs. Each smaller limb branches into sticks. Each stick branches into twigs. Each twig branches into leaf veins. //If a tree were a symphony, you'd hear a basic melody repeated with ever-increasing refinement and complexity.

Each small branch is a variation on theme of branching. That is, each part resembles the whole. //For example, the veins in a leaf resembles a tree in shape; capillaries resemble veins and arteries.

//Branches are also visible in tree roots, rivers, the circulatory system, the nervous system, the lungs, roads, audio systems, single-point grounding systems, organization of knowledge, distribution of knowledge, and more.

Figure 7. A typical script. Note the edit marks.

Figure 7 shows a typical script with edit marks. Instead of marking the words that were flubbed, the producer marked the beginning of the sentences containing the errors. Those marks correspond to the edit points on tape. Two marks indicate a second re-take.

Editing

After the recording is done, you're ready to edit out the mistakes. Play the tape and follow along in the marked-up script. When you come to an edit point, stop the tape. Put the recorder in "cue" or "edit" mode. Rock the tape back and forth over the playback head to find the exact beginning of the flubbed sentence. Mark the tape at the playback-head gap with a grease pencil. Then, using a razor blade and splicing block, cut the tape about 1/2-in. to the right of the mark.

Next, put the feed-reel tape back into the tape-path slot, and pull the tape past the heads. You'll hear the flubbed sentence. The announcer will stop, then restart the sentence. Mark and cut the tape at the beginning of the corrected sentence.

After removing the flubbed section of tape, splice the two remaining tape ends together. Play the edited portion to check it. You should hear no double-breaths between sentences. Also edit out paper noises and table thumps.

Once the tape is edited, add leader tape, label the reel and tape box, and store the tape tail out.

You might want to make a *proof* cassette copy of the tape to send to the script publisher for approval. The

publisher may notice reading errors that you missed during the recording session. They'll send back a marked-up script showing the errors. The next time the announcer is back in your studio, have him or her re-record the sentences or paragraphs needing correction.

Be sure to match the recording levels, microphone position, etc. with those of the original tape. Otherwise the inserts will sound like another person has started talking. Play some of the original tape to the announcer so he or she can duplicate the pitch and tempo. You may need to equalize the inserts to match the original take.

When the inserts are edited into place, make and send another proof tape to the publisher. If it's error-free, you can add sound effects or music as needed.

Sound Effects and Music

Many scripts require certain sound effects to accompany the narration. If you record the speech on Track 1 of a 2-track tape recorder, you can record the sound effects on Track 2 in the spots where the script calls for them. After the effects are recorded, mix the 2-track tape of narration and effects to mono, and record the mix on another deck. Or you can use a 4-track machine for the master recording, to record music or effects in stereo.

Libraries of sound effects and mood music are available from several record companies, advertised in recording industry magazines and audio-visual publications. Many

require royalty payments for each use of material. Some sound-effects records found in the Schwann catalog can be ordered through record stores. You can even record the sound effects yourself in some cases.

Sound effects can be pre-recorded on broadcast cartridges, which can be played and mixed in "live" as the narration is recorded. Alternatively, the record cuts can be cued up on turntables, and played back as needed.

Many productions require a musical introduction which is faded down when the announcer starts talking. These productions usually have musical outros, too. An *outro* is music that fades up near the end of the narration, then fades up and out to provide a musical conclusion to the program.

Back-Timing Musical Outros

You'll often want the outro to end simultaneously with the narration. This can be achieved with a technique called *back-timing*. Here's how it's done:

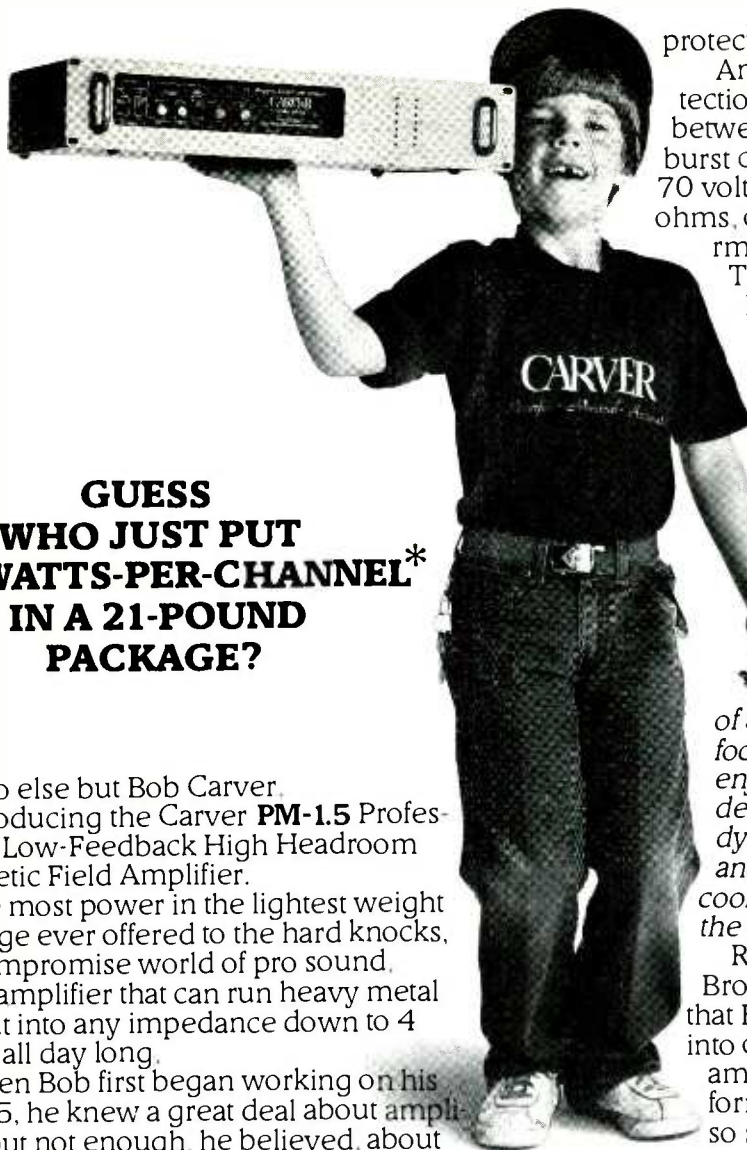
First, find the spot in the script where you want the outro to start fading up. Play the tape starting from there, and time it to the end of the narration. Let's say it's 30 seconds from fade-up to end.

Now, put a tape recording of the outro on a tape deck, but reverse the reels so it plays backwards. Start playing the tape at the *end* of the musical piece, run it 30 seconds (or whatever), and stop. Then turn over the tape and replace the reels. You now have a musical outro tape cued up 30 seconds from the end.

Next, put the narration tape on a 2-track machine. Narration is recorded on Track 1. Set up the tape machine to re-record the musical outro tape on Track 2.

Start playing the narration tape several seconds before the fade-up point. Then start playing the music tape just before the fade-up point, and fade it up. If your timing is right, the music will end just after the narration ends. This gives a tight, professional touch to the production.

We've given some basic advice about recording the spoken word with a consistent, clean sound, and we've briefly described how to add sound effects and music. This type of studio work should not be neglected, since it is the major source of income for many studios. And it's another skill to add to your resume.



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Hacker's Digest

What's this? An article on computers—in *MR&M*? What's going on? Some kind of mistake, probably. Maybe you picked up the wrong magazine—you check the front cover. No, it's *MR&M* all right. Maybe a mistake at the printers—somebody inserted the wrong page in the magazine. You scrutinize the page carefully—no, it seems to be consistent. Probably some kind of joke—the editor's having some fun—the April fool's issue... that's it! No—can't be, it's the May issue. It doesn't make any sense. Why read about computers in a recording magazine? I mean, how useless, and moreover, how irrelevant. You put the magazine down—no, actually you're a little steamed so you throw the damn thing across the room. It lands in the corner, with all the dustballs. You flop on the bed, exhausted from your anger, and soon doze off.

Some Time Later...

You open the door and step into the control room; a pair of 3M 32 track machines and a Neve console greet you; everyone runs up to you, relieved that the engineer has arrived. At last, the session can begin. You're not too sure about what's going on. Apparently, someone took notice of those 2 track demos you made in your basement. A wildly gesticulating producer leads you over to a keyboard, a Synclavier; they can't get the timbre they need. They want *you* to program it for them. You take a look at the video screen full of commands and almost faint. Someone else pulls you backward and you land in the chair behind the console. It's time for the automated remix; someone hands you the floppy disk for the Necam automation package. You stare at it dumbly, but eventually perceive a disk drive under the console with an open door. You put the floppy in, but nothing happens. As someone once said, there are eight ways to insert a disk in a drive, only one of which is interesting. Suddenly there's something wrong with the digital tape machine—the bit error concealment light keeps blinking. They open the

drawer and thrust you in, head first. A hundred thousand dollars of high technology confronts you; you swallow hard. Then the EPROM in the digital reverberator falls out of its socket, the autolocator puts all of the tape machines in fastforward, and the console's faders are shooting up and down. The entire studio is plunged into mayhem, the session is a sudden disaster. The studio manager bursts into the control room and grabs you by the collar and drags you into the office and dumps you down in front of the office computer and hands you an inventory program; clearly you have just been demoted from first engineer to go-fer. You stare at the keyboard; you don't even know how to type. Meanwhile a guy shows up to apply for your former position. He explains that he has recorded nineteen gold records, has a complete personal set of every model of Neumann microphone, can repair burned-out op amps with his portable micro-fabrication tool kit, and will be bringing twenty-eight major acts with him into the studio. Of course, the studio manager says, but what we want to know is: Are you computer literate? The guy hems and haws then answers...no. The manager throws him out, looking disgusted. You wake up, run to the corner, and brush the dustballs off that copy of *MR&M*.

What's this? An article on computers—in *Modern Recording & Music*? That's right, and the editor has even asked for a series of articles, until computers go away...or the magazine folds—whichever comes first. I'll try to cover as many aspects of modern computing, both theory and applications, as I can, emphasizing the most current aspects of the revolution as they appear. And, in between upheavals, I'll plug in information in terms of computer fundamentals and product reviews.

It's a Brand New Day

Ever get the feeling that a whole new day is dawning, and you're being left in the dark? Ever think that you're moving ahead, but not nearly fast enough? I'll try to inform you, and include you as best I can. An

article every month or so can help, but if some outside reading, or computing, will help, I'll tell you that too. And what about audio? Of course I'll try to keep in touch with the reason you read this magazine in the first place. But let's be blunt right from the beginning. If you're into audio, and you think you can pick up a little computer stuff on the side and be okay, you've just built yourself an obsolescence timebomb. The computer revolution is pervasive and fast-moving; the audio industry is struggling to keep up. If you want to have a contemporary position in the audio business, you'll have to struggle even harder to keep ahead. Like a lot of people in our society, please say hello to the technology which is changing your life.

All of the above may sound a little frightening, and if you misconstrue the impact computers are having, and what your proper response should be to that impact, you might indeed feel apprehensive. That's why it's important to properly understand the computer phenomenon and see it for what it is—an exciting, challenging, entertaining, and profitable endeavor offering itself to you. But as with any jet plane taking off, you need a ticket, and that's where education comes in. Right now the world is undergoing the biggest social adjustment since the beginning of the Industrial Age a hundred years ago. Now we are leaving behind that Industrial Age and entering the Age of Information. Workers everywhere are shifting from jobs as builders to find new work as data processors. We no longer need a large labor force to manufacture automobiles; now we need people to design manufacturing robots. Of course, that sudden upward move in sophistication has been engineered by digital computers. To be a part of our technological society, it is increasingly important to understand how to use the basic working tool of our society—the computer.

As I mentioned, the key word of our era is information. I challenge anyone to name an endeavor that could not be enhanced by furthering



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its information base. The truth of that statement has been widely recognized, and has precipitated an incredible acceleration, with information as both impetus and goal. Everybody wants access to information. Before a doctor diagnoses your ailment, he turns to his terminal to access the latest information on disease and drugs. When a salesperson prepares a marketing survey, he utilizes the information in the corporation's data base. Before the government decides to build a new highway linking two cities, it (hopefully) studies the census data to prepare demographic projections. When an engineer designs an automobile body, he simulates the contour to make aerodynamic fluid measurements. When a bank makes a loan to a foreign country, its financial computers access thousands of records and prepare recommendations. When a student wants to learn, he asks a video screen to teach him. It's all a question of information and how best to access it. It's all there; you only have to know how to ask for it. Computers make the asking a lot easier.

Let's Get Real

Okay, so much for generalities and gee-whiz stories. We've all heard that computers will give us a two-hour work week and lots of spending money. What about reality? Well, I can speak best about my own experiences with computers. I've designed computers and programmed them, but most important, I've used them in my work. First, as a writer of 10,000 words a month for sale, and another 10,000 words a month for pleasure, I need an efficient way to write down, edit, and print out that torrential text flow. As you might guess, I long ago abandoned my Selectric and Ko-rec fluid as inadequate tools—revisions required tedious correction or re-typing of the entire text. The modern alternative, compliments of computers, is word processing. With a computer and a program such as Wordstar, entry and storage is done electronically; a menu of a thousand commands permits rapid corrections, editing, saving, and printing of a text (such as this one). The software dictionary even checks my spelling, correcting both typos and bad guesses. Aside from convenience is the very real fact that a word processing system encourages you to write better. In the past, an awkward sentence often remained, simply because the

chore of revision was too great. Now it's only my own muddled thinking, and not laziness as well, that generates cryptic prose. (Believe me, that's more than enough—Ed.) Also, storage is greatly facilitated. A few floppy disks hold the million words I've strung together over the years. Moreover, all of that information is accessible to me through a catalog program. Am I a believer? I have a word processor downstairs, one upstairs, and a portable one for when I go to the beach to relax. I've estimated that my prose output has been at least tripled, thanks to computers.

A second example of my computer usage occurs in my role as a recording engineer. As our dreamer's subconscious revealed earlier, digital electronics is proliferating throughout the recording studio. As in every other industry, to compete effectively the production tools must be as contemporary as possible. In entertainment revenue, the recording industry formerly ranked number two, second only to the motion picture industry. Now it's number three, film is number two, and video games are number one in the entertainment competition. The microprocessor technology, which suddenly created that new entertainment industry—and made it number one—is now being applied to film and audio, as those industries attempt to rebuild to today's technological specifications. It's a tremendous effort, but absolutely necessary. Those video quarters will only return to the record store if the recorded music begins to sound better, and is accessible through more convenient (with less incentive for pirating) consumer formats. Of course, digital technology is the answer, and everything from music keyboards to tape machines, from consoles to Compact Discs have been newly devised. All of analog audio is being rewritten in terms of digital technology. It is already envisioned that all of the facets of the recording studio will eventually be consolidated into a central computer in which the digital microphones go in and the digital music comes out.

The Computer in the Studio

One example of how a little computer technology has changed studio procedures is console automation. As a recording engineer who had perfected a mixing technique, then chose to adapt it to automation, I can speak for the advantages of the new tech-

nology. A console is essentially a control surface used to balance input channels and process them individually and collectively. With 32 channel inputs, there are probably over 300 possible operating controls to be manipulated by the mixing engineer in the course of a mixdown; that obviously exceeds his ability to comprehensively control the process. I used to do it, with help from my friends—sometimes enlisting five other people to manipulate controls; to accomplish that kind of operation successfully, let alone artistically, in real time, led to many, many, many takes. With automation, operating parameters are written and read as digital data. The mix is accomplished piecemeal, and the manipulations are stored each time as data and then played back to automatically control those parameters while the engineer moves on to something else. After his last update, the engineer's job is finished, because all of his successive efforts have been saved and now the mix is controlled automatically. I have observed two results of this production method: a much greater degree of musical sophistication is possible, and attention to detail is facilitated; with automation, I've walked away feeling that I had achieved a perfect mix—something I had never felt after a complicated non-automated mixdown. Also, a good mix may be achieved much more quickly, because the most complex part of the job can be broken down into smaller tasks, each more easily accomplished.

I think that both word processing and console automation provide similar examples of the computer advantage. In both cases, a greater degree of expertise is made possible, and the job may be accomplished more rapidly. The operator has become more efficient, but it's more than that—his talent and skill have been extended. That, I think, is the essence of the computer advantage, and it's available to anyone willing to pay the modest dues required to become computer literate.

I hope you'll stay with this series of articles. I'll be explaining everything that's new in this new and powerful technology. In fairy tales, the hero always has a magic ring, or sword, or seven league boots. In some way, his courage is magnified by a special token he has won for himself. Today, the hero uses a computer. I mean, do you want to be an ordinary guy, or do you want to be *awesome*?



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The Echotron is a full bandwidth (16KHz at all delay settings), solid state digital delay loop. With a delay range from 256ms (¼ second) to 4096ms (4 seconds) the Echo-

tron is capable of producing very subtle to very spacey effects. Using the METRONOME feature and the DELAY FACTOR allows the musician to create bass lines or rhythm tracks. Hard and soft roll off feedback and synchronization for drum machines top off the versatile features of the Echotron.

SUPER TIME LINE®

The Super Time Line series offers versatility, proven reliability, rugged construction, full audio bandwidth/dynamic range and PROGRAMMABILITY. Both the ADM-512 (½ second) and the ADM-2048 (2 seconds) are complete single channel special effects processors with simulated stereo outputs. This allows you to program such widely used effects as flanging, vibrato, tremolo, feedback flanging, doubling, chorusing, echo and multiple echos. Each unit also contains non-deteriorating infinite repeat which is activated either by the front panel control or the ADM-STL remote foot switch, also available from DeltaLab.

*Manufacturer's suggested retail.



DeltaLab

Music & Electronics ... Naturally!

Music and the Law

Performing Rights Organizations

Paul McCartney's worth was recently estimated at approximately four hundred million dollars. The largest single source of this fortune is the revenue generated from the sale and reproduction of his original songs and those he co-authored with John Lennon.

Song writing revenues are derived from the sale of the right to reproduce or copy songs on tape, film, disk, or in print, and the right to perform those songs publicly. Such rights include the right of first use (usually the right to make the first commercial recording of the song), the right of subsequent use (mechanical licenses), performing rights, synchronization rights, and print rights.

These rights are the property of the copyright holder, initially the songwriter. In some instances the song may be written as a "work made for hire," which means the writer is regularly employed to write for his employer or is commissioned to write the specific work, and the employer holds the copyrights to the song. In most cases, however, the writer holds the copyrights and negotiates for their sale with a record company or publisher.

Know Your Rights

The writer should be very careful when dealing with the purchaser to insure that as many rights are retained as is possible, or that he receives reasonable compensation for each and every right that is sold. The writer should also insist that some provision gives him and his accountant the right to audit the purchaser's books on a regular basis.

The sale of these rights may be for a flat fee or for a royalty—a percentage of the sales of the work fixed in some medium. Record royalties are usually based on the statutory copyright rate of four cents per copy sold, but they are subject to negotiation. Print royalties depend on the type of publication and arrangement. Standard rates are six cents per copy for regular piano copies sold in the United States and Canada, ten percent of the wholesale selling price for orchestrations and arrangements sold in the United States and Canada, fifty percent of the proceeds received by the publisher in the United States from foreign licensees, and fifty percent of the sums received by the publisher from mechanical licenses.

Fees are also received from radio and television stations that broadcast the song, jukebox operators

that play it, clubs and other venues where music is performed either live or "canned" (performing rights), and from producers who synchronize it with moving pictures, i.e., motion pictures, videocassettes, etc. (synchronization rights). The most important of these rights have become the mechanical and performing rights, though synchronization rights may come to be predominate in the future.

Once a song is recorded, anyone may then make his/her own recording of the song (though duplication of the original record is prohibited) so long as permission is obtained to do so—either by registering that use with the copyright office and paying the statutory copyright fee or by obtaining a license from the copyright holder or his agent. This license, which permits the reproduction of music by mechanical means (records, tapes), is called a "mechanical" license, and is usually arranged through the Harry Fox Agency, Inc., in New York City.

The Harry Fox Agency, which represents several thousand music publishers throughout the United States, was formed to meet the need of the publishers to determine how many recordings of their songs were being made and to ensure proper accountings of those songs. Such tasks were too cumbersome and costly for each publisher to perform, so the industry-wide organization, the National Music Publishers Association, Inc., created the Harry Fox Agency to issue licenses to, and supervise the collection of fees from, record companies. One need only think of the many different recordings of a song such as "Yesterday" by Paul McCartney and John Lennon to appreciate the scope of the problem and the size of the fees such licenses return to the publishers and songwriters.

Mechanical licenses are more commonly used than copyright licenses due to the stringent reporting and payment requirements of the Copyright Law. Under this statute, the record company must issue a notice of intention and make monthly accountings and payments. All financial statements must be prepared and their contents sworn to by a certified public accountant. The statutory royalty rate is based on formulae pertaining to length of the composition and the number of records manufactured and sold.

A mechanical license allows accountings and payments to be made on a quarterly basis and permits the use of a royalty rate different from the statutory

rate. Payments pertain to records sold. This license requires a simpler method of compliance than the Copyright Law and is much easier for a record company to work within. The Harry Fox Agency keeps a small percentage of the gross receipts for its fee and passes the rest to the copyright owners. The license provides Harry Fox with powers of enforcement, including the right to inspect the record company's books and to sue for breach of the license.

Performing rights pertain to the public performance of protected compositions, whether live or broadcast, played on jukeboxes, radios, tape machines, record players or televisions, and presented in clubs, concert halls, schools, or other public places. The licensee of these rights is required to pay a fee for each use of each protected work. The monitoring problems facing copyright holders in this area are even greater than those involved in the case of mechanical licenses.

Alphabet Soup

Performing rights licensing and monitoring are provided by three major organizations: the American Society of Composers, Authors and Publishers (ASCAP); Broadcast Music Incorporated (BMI), and SESAC. ASCAP and BMI are not-for-profit organizations; SESAC is privately owned. The membership of all three consists of writers and publishers.

The purpose of each of these organizations is to collect royalties for every public performance of works in its respective catalogue. All three require that a writer's work must be published or be recorded before accepting him for membership. ASCAP accepts writers of commercials. BMI and SESAC do not. At one time, they enticed artists to their rosters with monetary advances. Because of the current state of the music business, such advances are no longer available. A recent article in *Billboard* (Kip Kirby, "Performing Rights: No Slowdown," January 21, 1984, pp. 37-8) discussed the new methods the organizations are using to increase their membership in Nashville. Both ASCAP and BMI provide their members with references and projected earning statements to help secure startup funding and credit from banks, and are placing additional emphasis on education and participation in industry projects and events. ASCAP also puts on writer workshops. SESAC reported that it is primarily interested in working with young, developing talent, teaching and preparing them for their first publishing contract.

Performing rights collection procedures are currently in a state of flux. "Blanket licensing" has been challenged in several courts and, in 1982, a federal court found that blanket licensing in conjunction with independent television stations violated the anti-trust laws. (This decision is presently being challenged.) Each performing rights organization issues a "blanket license" to broadcasters and other purchasers of its music which is based on a small percentage of the purchaser's gross revenues. The major purchasers of music obtain licenses from all three organizations. Each performing rights organization then monitors each purchaser to determine the amount of airplay each song in its catalogue is getting, and then divides the revenues accordingly. BMI, for instance, advertises that it monitors "13,698 hours a day." ASCAP also monitors broadcasts, but SESAC makes its determinations through the study of reported playlists and industry charts.

MAY 1984

Many writers are now forming their own publishing houses (at least in name) to sell their music. These organizations then sign contracts with the major publishers. No matter if a writer establishes a business entity or sells songs in his own name, it is mandatory that he join one of the performing rights organizations. ASCAP is number one in regard to collection of total revenues whereas BMI has the largest membership. SESAC is sometimes said to provide the most personal approach. Most publishers have divisions with membership in each organization for the benefit of their writers. Each writer should investigate all three organizations to determine which will serve him best.

Another organization that composers should be familiar with is the American Guild of Authors and Composers (AGAC). This organization provides its members with model contracts to be used with publishers, legal assistance, audit services, and educational seminars and newsletters. It also collects songwriting royalties for a small percentage of the gross revenues.

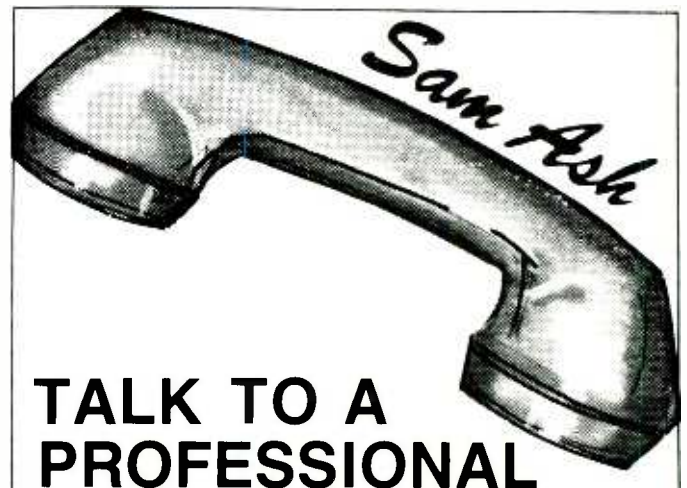
AGAC is located at 40 W. 57th Street, New York, NY, 10019, telephone number (212) 757-8833.

ASCAP is located at 1 Lincoln Plaza, New York, NY 10023, telephone number (212) 595-3050.

BMI is located at 320 W. 57th Street, New York, NY 10019, telephone number (212) 586-2000.

SESAC is located at 10 Columbus Circle, New York, NY 10019, telephone number (212) 586-3450.

The Harry Fox Agency, Inc., is located at 110 E. 59th Street, New York, NY 10022, telephone number (212) 751-1930.



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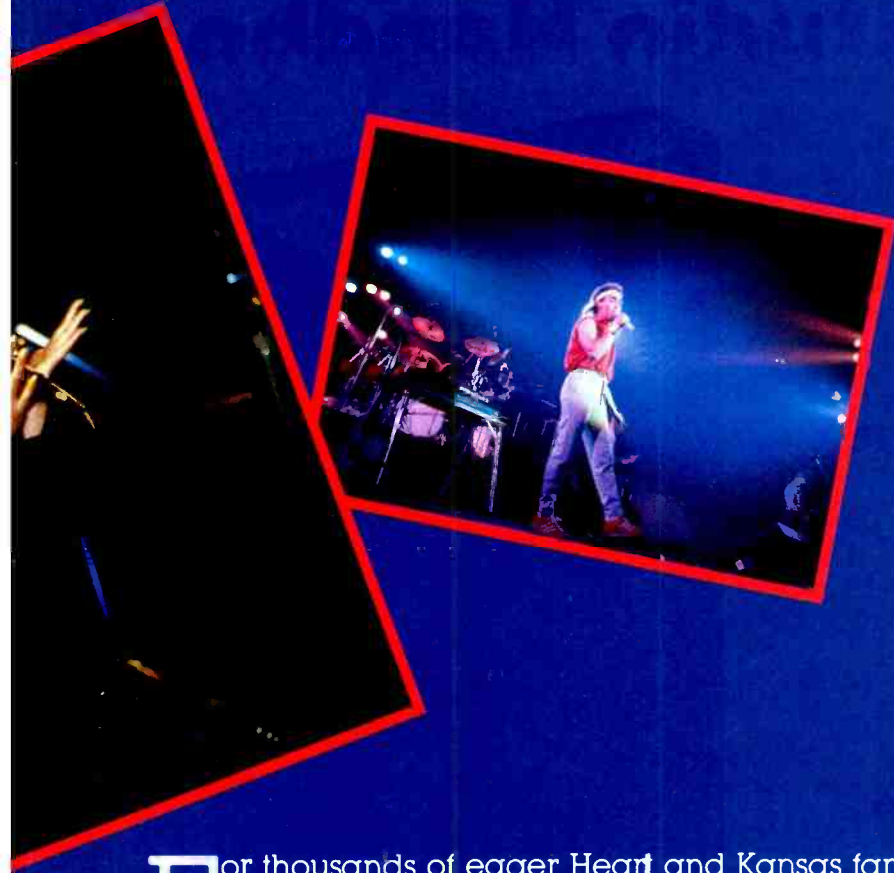
19

MIXING

A
DOUBLE



sam borgerson



For thousands of eager Heart and Kansas fans streaming into Nashville's Municipal Auditorium, the dual headliners on the marquee promised, "double your pleasure, double your fun."

For the tour's sound contractor, two headline acts meant doubling the "front end"—the mixing boards and effects racks—in order to allow optimum mixing for both bands.

To Guy Charbonneau, recording engineer and owner of the fabulous le Mobile remote truck, the twin bill meant working double time. You see, he also had to customize mixes for each of the two bands, but nobody provided him with a second Neve console to set and forget during the sound check. He'd just have to move rather quickly during intermission.

In a moment of calm before the concert, Charbonneau reflects on the unique problems involved in recording two headline acts in one evening. "We're recording two entirely different bands, and both have fairly complicated sets," says the Montreal-born Charbonneau, his English rounded by a strong French Canadian accent. "Between sets everything has to be reset on the console, including all the levels and EQ. I didn't want to make one group the 'opening act' and the other the main act. I had to treat them both equally and proceed as if I were concentrating on only one group tonight. It makes my job doubly difficult."

Despite the heavy work load, Charbonneau tackles his technical chores with a boyish enthusiasm. Although he approaches everything with a meticulous attention to detail, he doesn't let that diminish the enjoyment he gets from recording great rock'n'roll.

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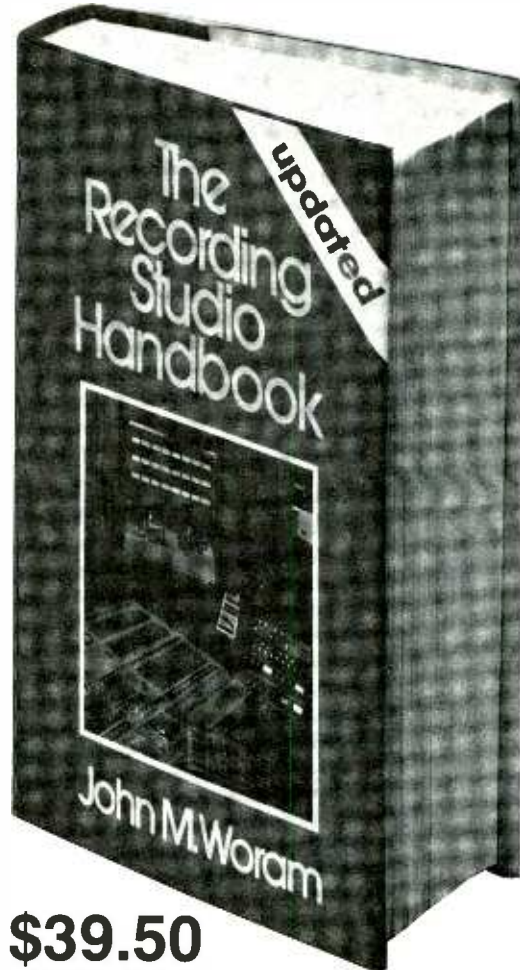
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Rock'n'roll has occupied most of Charbonneau's time over the past eight years. His le Mobile truck—lavishly equipped and immaculate inside and out—is the only Neve/Studer studio rolling on rubber in North America. As such, he is constantly in demand by major artists and producers who want top quality live tapes, and by those who would rather do their “studio” recording and mixing at home. Projects credited to le Mobile include Journey, Peter Frampton, The Police, Lena Horne on Broadway, Billy Joel, Foreigner, Pat Benatar, Genesis, The Doobie Brothers, Kansas (including their latest LP, *Drastic Measures*), Toto and Rush—to name just a few.

However, Charbonneau was not about to take it easy and rest on his laurels for the Heart/Kansas project in Nashville. As always, he arrives on the scene at mid-morning, ready to begin the long day of careful, precise preparations that are essential to first-rate recording.

“You have to take the time beforehand,” he says as a knowing grin spreads across his face. “Otherwise you go crazy, and you might forget to patch something when you should because you are too busy just keeping it all together. You don't want to have to fix things later in the mix. So we will have everything ready.”

The first order of business for the truck crew is working with the PA company to eliminate any possible AC hum problems. Whenever possible, Charbonneau tries to get on the same circuit as the PA, or at least get the same mechanical ground. If that doesn't work, he has an AC isolation transformer inside the truck, and the whole system can always be mechanically grounded.

Charbonneau usually stays in the truck during most of the setup, sound check, and performance. All on-stage duties are handled by Cliff Bonnell, who works with the PA crew to determine best mic placement, optimum signal routing, and set change procedures. During the performance he's in charge of on-stage troubleshooting.

Unless they have strong feelings to the contrary, le Mobile's engineers will leave microphone selection up to the PA mixers, even though le Mobile has over 90 of the best studio mics on board. “I don't try to talk them into using my mics, except in the case of the drum overheads, where I prefer to use AKG 414s,” says Charbonneau.



This ain't no ordinary 18-wheeler.

“I find using this mic gives me a consistent drum sound, and it really has very little effect on the PA sound. But if you try to change a vocal mic, then everything will change for the band. You might get a slightly better quality recording, but it will change the sound in the monitors and you might end up with a different performance because the singer won't be sure about what he is doing. So on stage I will deal with what they normally use, even if I think it is technically not the best. But once the signal gets in my truck, then I will compromise on nothing!”

Le Mobile's input snake has 64 inputs. The first 32 go directly into the Neve console, and the next 12 go to an auxiliary mixer permanently installed in the equipment rack. If more inputs are needed, a second auxiliary mixer can be brought in.

In mixing this “double date,” Charbonneau relies heavily on information from the bands' PA mixers in determining his console channel assignments: “After I got the PA input lists from Kansas and Heart, I looked at them closely to find a way that would work with a minimum of changes. For example, I wanted to keep kick and snare on the same input, even though I knew all the tom configurations would have to change. Also, as much as possible, I wanted to

keep the same instruments assigned to the same track of the recorder. That way it would minimize any chance of mistakes, especially when it involved patching in limiters.”

The approach for recording the drums differed markedly between the two groups. Because Kansas has a vast array of keyboards and tape effects, only four tracks could be assigned to drums. But because Heart has a shorter instrument roster, 11 tracks could be allowed for drums, including five tracks for the Roto-toms alone. Charbonneau's reasoning: “They have a Simmons (electronic drum) setup, and they use the Roto-toms to key the Simmons for special effects. But instead of putting the Simmons on the tracks during the show, we used more tracks for the drums, which allows the option of keying a Simmons during re-mix and working for the exact effect you want, to recreate it or even enhance it. That's why it is crucial to talk to the PA engineers before I start doing any track assignments. I have to know what they are doing in the show so I know what options I have in recording, and what I want to leave open for them to change in final mixing of the tapes.”

During recording, Charbonneau watches his two video monitors and follows cue sheets for guidance. The

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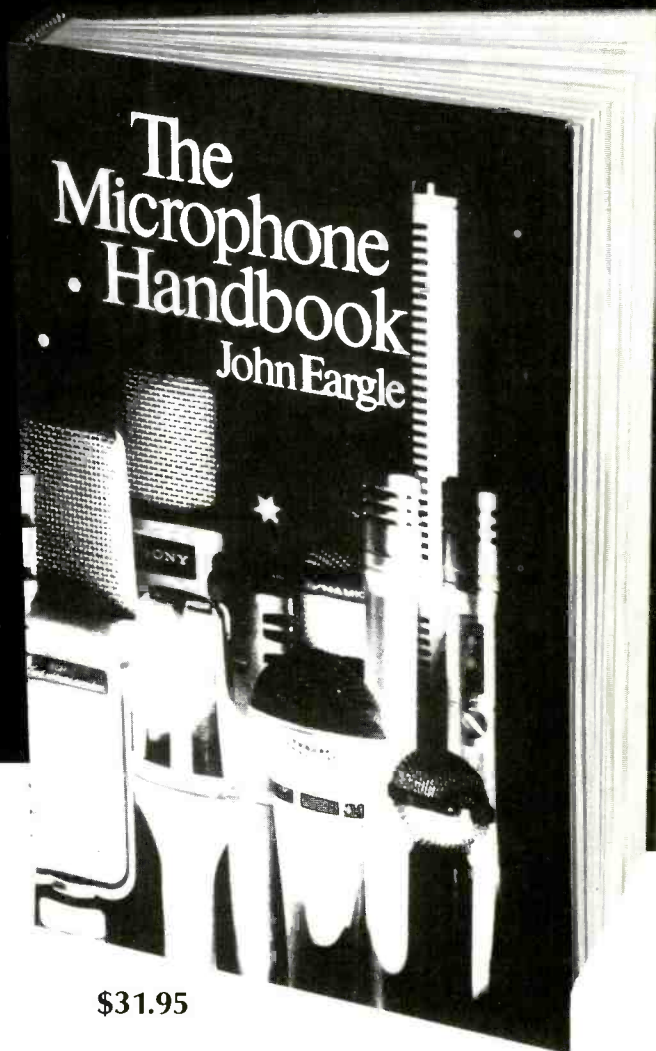
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noted author, lecturer and audio expert, is vice-president, market planning for James B. Lansing Sound. He has also served as chief engineer with Mercury Records, and is a member of SMPTE, IEEE and AES, for which he served as president in 1974-75. Listed in *Engineers of Distinction*, he has over 30 published articles and record reviews to his credit, and is the author of another important book, *Sound Recording*.



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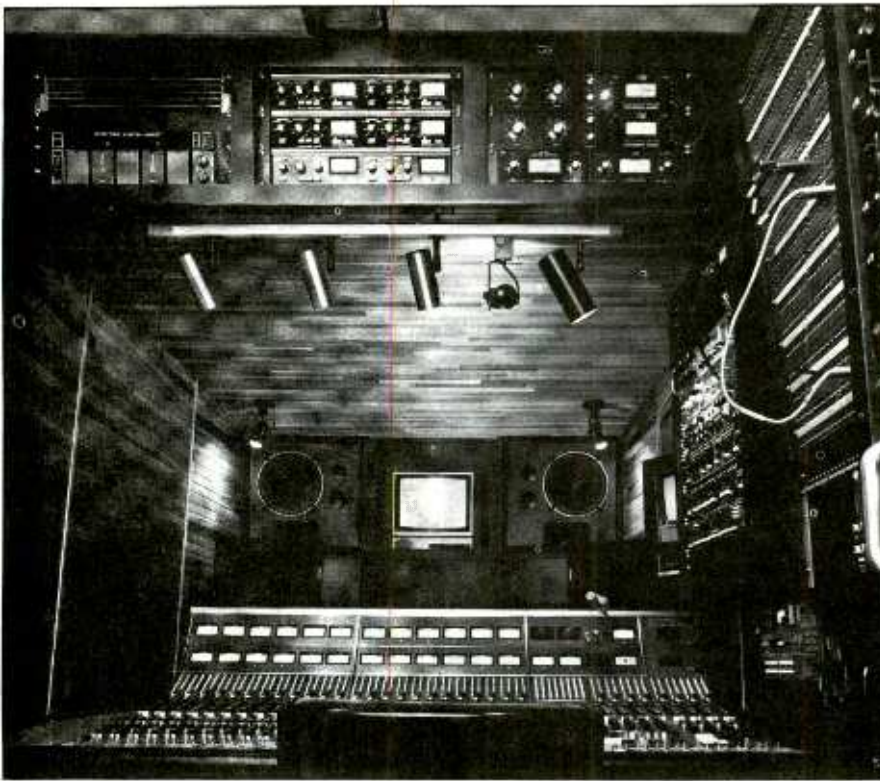
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Inside le Mobile (we told you it wasn't ordinary).

handwritten cue sheets, supplied by the two house mixers, indicate instrument changes, lead and background vocals, pre-recorded tape effects, and instrumental solos. (A note to aspiring concert mixers: good handwriting can be important!)

Even though the final version of the night's performances will be mixed weeks—or even months—later, Charbonneau always concentrates on getting a monitor mix as close to perfection as possible. "I try to make it sound like a final mix," he says. "I feed the monitor mix to my six cassette decks, so the bands can take a cassette back to the hotel and hear what they did in a way that's close to a finished album. So for the monitor mix I usually add some reverb from the EMT 250, and sometimes a Harmonizer or digital delay of some kind. Also, I've discovered that if your monitor mix sounds good, it will sound good on tape."

The signal routed into the Studer A800 24-tracks is always dry—no added reverb or effects. When recording for radio shows the Studers run at 15 ips with Dolby noise reduction. For album projects, 30 ips tape speed is usually preferred.

The stereo monitor mix is also routed to a Sony BVU800 video recorder. A fixed color camera on stage provides the video portion, and a SMPTE time code track is also recorded for future reference. If

Charbonneau is assigned to the final mixing, he finds it helpful to watch the videotape while he's working. Sometimes a quirk in the sound will turn out to be a changed instrument setting or an unplanned movement of a microphone. He will also switch back and forth between the final mix and his "real time" monitor mix to make sure he's keeping the feel of the live show.

A perfectionist by nature, Charbonneau does his best to deal with the small compromises often encountered in live remotes. A case in point: the wireless microphones used by Kansas. "You can get a great wireless sound," he admits, then adds, "but it's rare. If you listen to the vocal track alone, soloed out of the mix, you can hear compression. But you can't hear it in the PA mix, and you can't really hear it in the recording mix either. That's why, at least for a radio show recording, I wouldn't ask them not to use it. If a singer has been using wireless for a month and you try to tie him down with a cable, it could change his whole performance."

Allowing the performance to take its natural course is a fundamental part of le Mobile's operating style. The unspoken motto seems to be, "Perfection in the truck, laissez faire on the stage." For example, Charbonneau rarely asks for extra sound check time to set up his board. "You don't want the band to start thinking about it," he maintains. "If you make

them too aware of the recording, they will analyze everything they do instead of going for the feel. That's what I don't want. For me, it's like being a race car driver. You don't try to tune the engine when you are out on the track. You do that beforehand. When you get out there, you just want to go as fast as possible."

C'est ça!

Needless to say, the live sound emerging from le Mobile's custom JBL monitors was stunning. But what about the throngs of fans inside? What did they hear?

Well, considering the questionable acoustics of the Municipal Auditorium—your standard steel-domed sports arena—the crowd was treated to sound easily a cut above what you'd expect in this venue. Considerable credit for the superb sound must be given to Delicate Productions' magnificent PA system.

Based in Canoga Park, California, Delicate Productions is an offshoot of the Supertramp organization. Delicate's current owner/engineers came over as band employees for the 1979 *Breakfast in America* tour. When the group suspended touring shortly thereafter, the Supertramp engineers decided to have a go at it on their own. Their lofty reputation—for both equipment and expertise—has kept them busy ever since, with no need to even advertise their services.

Depending on how you look at it, the Delicate PA is either a throwback to a former era or simply bucking a trend. Whereas most other major PA companies are going with all-in-one bins (bass-mid- and high-frequency drivers in one enclosure), Delicate is sticking with a tried-and-true Martin modular 4-way component system. The bass cabinets each house 2 JBL K140 units, and the low-mid boxes each hold 2 ATC PA-75 drivers. High-mid frequencies are handled by Renkus Heinz 3300 and Emilar EH500 combinations, while the top end goes to Emilar EA-175/EH-500 units. For this tour, Delicate provided 48 bass cabinets and 36 each of the three other boxes. Racks of AB Systems and H&H amplifiers—62 in all—poured 48,160 watts of power into the audience, assuming uniform 4 ohm loads and all equipment up to spec. In any case, we shan't be picky: it was plenty loud.

Of course, it's easy to be loud. It's not always easy to sound *good* in an

HEART/KANSAS EQUIPMENT LIST

P.A. SPECS

Flown: (per platform)

- 8 Martin 215 Bass Cabinets (each with 2 JBL K-140)
- 6 Martin 212 Lo-Mid Cabinets (each with 2 ATC PA-75)
- 6 Renkus Heinz 3300/Emilar EH500 Hi-Mid Drivers
- 6 Emilar EA-175/EH-500 Hi Frequency Drivers

Stacked On Wings: (Per side) 3 ft. High Maximum

- 4 Martin 215 Bass Cabinets (each with 2 JBL K-140)
- 3 Martin 212 Lo-Mid Cabinets (each with 2 ATC PA-75)
- 3 Renkus Heinz 3300/Emilar EH500 Hi-Mid Drivers
- 3 Emilar EA-175/EH-500 Hi Frequency Drivers

These small front fill stacks can be suspended from the underside of the platforms if artist requires. (e.g. Supertramp)

Rear Fill/Side Fill:

Same specs as P.A., stacked on P.A. wings.

Total:

- 48 Martin 215 Bass Cabinets
- 36 Martin 212 Lo-Mid Cabinets
- 36 Renkus Heinz 3300/Emilar EH-500 Hi-Mid Drivers
- 36 Emilar EA-175/EH-500 Hi Frequency Drivers

AMPLIFICATION

- Bass: 24 AB Systems 1200; 540 watts per side into 4 ohms
- Lo-Mid: 18 H&H 5500D; 340 watts per side into 4 ohms
- Hi-Mid: 10 AB Systems 1210; 250 watts per side 4 ohms
- Highs: 10 AB Systems 1210; 250 watts per side into 4 ohms

HOUSE

Output/Drive Rack Consists of:

- 2 dbx 160X
- 2 Klark Teknik DN27s
- Brooke-Siren 4-Way Stereo Crossover
- Technics RSM-85 Cassette Player/Recorder
- Inovonics 500 Spectrum Analyzer

HEART

- Main Console: Midas 36 channel. DA01 Modules
- Auxiliary Console: Yamaha 15/24
- House Mixer: Brian Foraker carries own effects
- D.P.C. provide: Lexicon 224 and 3 dbx 160s

KANSAS

- Main Console: Soundcraft Series IV, 40 inputs/16 subgroups
- D.P.C. provide: Lexicon Prime Time, Lexicon PCM 41, Lexicon 224 with remote Eventide H949 Harmonizer, 2 dbx 160s

MONITOR SYSTEM

- Soundcraft Series IV 40 input/16 output
- 9 Klark Teknik DN30/30s providing 18 $\frac{2}{3}$ octave Graphic Equalizers
- White 140 Spectrum Analyzer
- 11 Brooke-Siren 2-Way Crossovers
- 3 Yamaha F1040 4-Way Crossovers (Flown Monitors)
- 15 AB Systems 1210 Amplifiers
- 3 Custom Flown Monitors
- 12 Martin LE-200 Floor Monitors
- 4 DPC/Wells Side Fill/Drum Monitors
- Separate microphones, D.I. Boxes, stands, cables and sub-boxes for each act to expedite changeover between acts.

DELICATE PRODUCTION

- System Engineer: Mick Berg
- Monitor Engineer: Brendan Higgs (Heart)
- Assistant Engineers: Ian Ferguson, Buck Rawls, Bill Reid

BAND CREW

- Kansas House Engineer: Davey Moire
- Kansas Monitor Engineer: Rob Colby
- Heart Engineer: Brian Foraker

overgrown teapot. In this respect, Delicate's system was a marvel to this writer's ears. The bands' PA mixers seem to agree.

"The thing I like about the Delicate system is the transparency of the highs, the crispness you can get out of it," says Davey Moire, house engineer for Kansas. "It was that open, spatial sound. The difference between it and some other systems I've used is almost the difference you get by adding an (Aphex) Aural Exciter to the mix. It gives it an added depth and transparency. It's hard to say why. Maybe it's the drivers or the enclosures, but in any case there does seem to be an advantage to separating and grouping the drivers as they do, instead of going to a 3- or 4-way bin."

Brian Foraker, the mixer for Heart, concurs: "It's the most consistent sounding system I've used. It's natural sounding, and it's very musical. For one thing, I think it helps to have different drivers in different cabinets."

Dissenting opinions are welcomed (I assume) in the Letters to the Editor

section. Could this signal the reversal of a trend? Roadies would hope not: the separate driver systems like Delicate's are more difficult to assemble and dismantle.

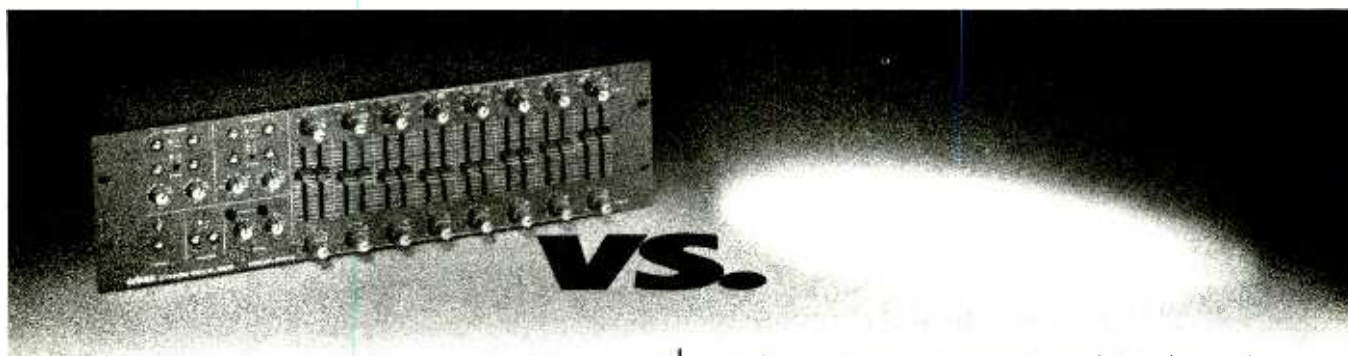
Although Brian Foraker has been mixing for Heart on the road intermittently since 1980, he has held the job steadily for only a year and a half. After he'd gained some experience as an engineer in a small St. Louis studio, he started at the bottom with Heart back in 1976, driving the truck, taking care of the drums and handling other equally glamorous jobs. He polished his skills by assisting on the house mixes over the years, and finally ascended to the post of primary PA engineer.

For this tour, Foraker's main mixing board is a custom 36 channel Midas, built originally to specifications supplied by Russell Pope, Supertramp's chief sound engineer. An auxiliary Yamaha console was added as a submix unit, primarily for drums and Simmons electronic drums. A total of 28 channels were dedicated to Heart drums and drum effects.

Working with two boards left plenty of inputs after the drums were taken care of, allowing double mic'ing for some instruments. On Howard Leese's lead guitar cabinets, for example, Foraker used a Sennheiser 421 and a Shure SM57, then blended the two for the best sound.

For vocals, Foraker used Shure SM85 microphones, all on cables because of the night's recording. "When we're taping, I even try to talk the guitarists into using cables instead of wireless," he says. "Then you don't have to worry about fading or RF leaking in. If that happens, the whole track is lost, and trying to recreate the same sound in the studio is always a pain."

Stacked to the right of the Midas was an effects rack that would be the envy of many good-sized recording studios. Delicate provided Foraker with a Lexicon 224 digital reverb and three dbx 160 limiters. He then augmented these basics with a selection from Heart's own collection of outboard gear: two ADR vocal stressors (for the Wilson sisters' vocals), an MXR digital delay,



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Lexicon Prime Time and PCM 42, two Eventide Harmonizers, and a Yamaha analog delay.

The Lexicon 224 serves as the primary reverb unit, and Foraker adjusts it to the requirements of each concert. "During the sound check I'll start out with a basic program, then fine tune it to the room. Sometimes I'll have to make the chamber sound a bit brighter if the room is boomy, or, if the room is already bright, I'll dull it down a bit. I use two outputs without gates for acoustic guitar and piano, then I use the two gated outputs for snare and toms, so I can get that 'Phil Collins/Genesis' effect in a big room."

Whereas Foraker got his top job by working his way up with one band, Davey Moire ended up as Kansas' top mixer through a series of lateral moves. After starting out as a studio engineer in Los Angeles, he was hired by Frank Zappa in the mid-1970s. After three years of concert

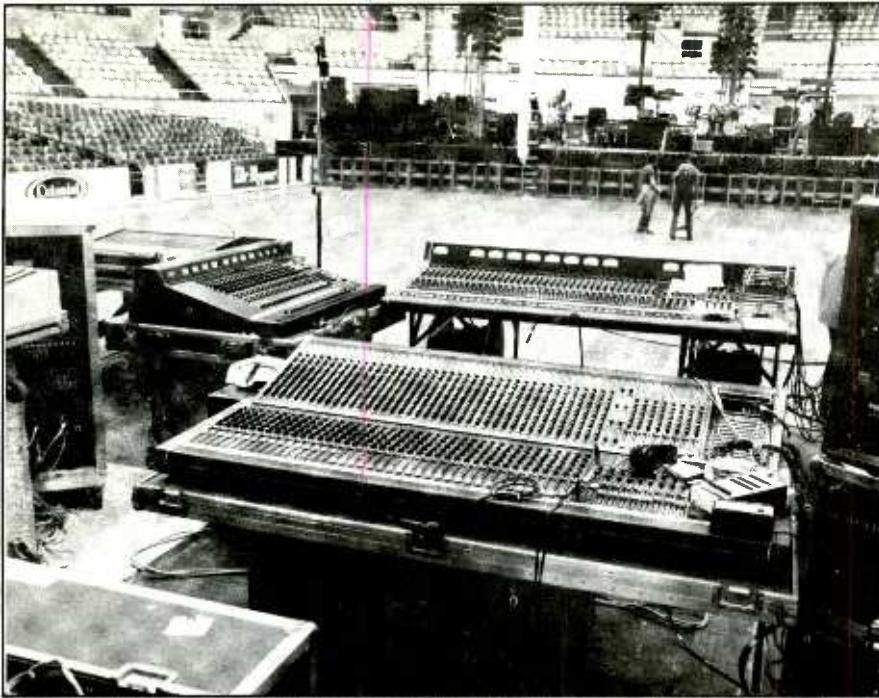
mixing and LP engineering (including *Orchestral Favorites* and *Zappa in New York*), he hooked up with Kansas in 1978. Since then he's mixed most of their concerts, and he has also earned engineering credits on three Kansas albums. Although basically under contract to Kansas—he'll do over 70 shows this year—he also does some studio work when at home in Atlanta. With any time left over, he moonlights with other artists (Peabo Bryson most recently) as concert sound mixer.

What is it like to mix for Kansas? "It gets so layered sometimes that it drives me nuts." Moire concedes with a laugh. "It's obvious that the more pieces you have in a group, the more thought you have to give to each frequency band and what instruments fall in there, so you don't overload and lose separation of individual instrument sounds. With Kansas, where sometimes you have 3 keyboard players on a total of five

electronic keyboards, plus guitar, bass, drums, and vocals, it can be tough keeping it all straight. Of course, after working with Zappa, I'm used to mixing big bands. I'm so used to it that sometimes I think I might have trouble mixing a band like Bad Company. And other times I think I could do it in my sleep!"

In concert, the band relies almost exclusively on Electro-Voice microphones. For vocals, Moire uses the HME wireless system with E-V PL80 capsules, a recent switch from his old choice, the PL77. "The 80 has a bit more of a hump in the presence range," according to Moire, "so it adds a bit more snap to the vocals. The 77s were warmer, but duller."

For instruments, Moire likes the PL11 on guitar amps and the PL95 for most drum mic'ing. "I know a lot of studio engineers who use the PL95 on toms. It has a flat, warm sound to it, so when you close mic, you get a lot of the low of the tom-tom, but you still



House mix setup for Kansas (foreground) and Heart (background).

get a lot of stick attack, a lot of 'whack.' With a band like Kansas, with a thickly layered sound, you need that attack to hear the roll-arounds on the toms."

After more than a year of using the Soundcraft IIIB console, Moire has moved up to the Series IV—and he's loving it. "The thing I liked about the IIIB was the way it sounded," he says. "It has a musical sound to the EQ, not an 'electronic' sound. Well, the IV has that same property—it sounds just as good—and it also has much more sophisticated signal routing. It's all digitally assigned, it has eight auxiliary sends, and eight returns on faders in a return section, and all of those returns can be assigned to any submaster. There are eight programmable mutes, so you can have a mute set up for virtually every song. You have 16 mono submasters or eight stereo, and—oh yes!—it has a studio quality patch bay."

Because of all the effects Kansas has at its disposal on stage, Moire keeps his use of effects to a minimum. He used the Lexicon 224 reverb primarily for vocals, although sometimes he will also use it for drums—especially on solo parts. As a general rule, he will also keep some reverb on the snare drum at all times.

"At the Nashville concert, the hall was pretty dry (not very reverberant) after it filled up," says Moire, "so I used what I generally use on a dry night. I used reverb mostly on vocals, though some I left dry just for

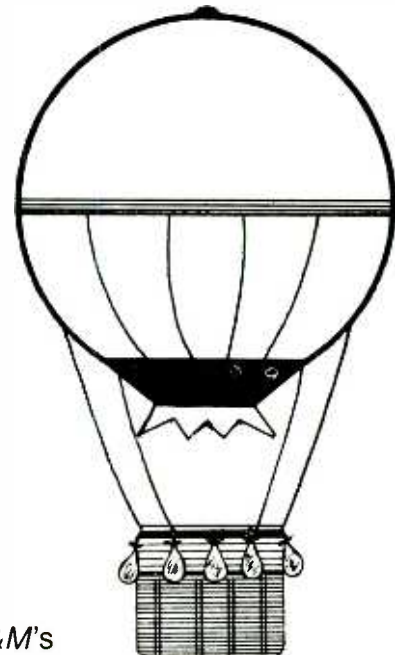
contrast. I don't like using effects just because they are in the rack. I use an effect as an effect. In certain songs from the new album I need a really steep delay—something like 175 to

200 milliseconds—so I'll use the Lexicon Prime Time. I also use the Lexicon PCM 42 sometimes, but only for extremely long delays. There are a couple of half-second repeats in "Everybody's My Friend," and there's a $\frac{3}{4}$ second repeat in "Point of Know Return," where it goes 'how far... how far...' where I use that effect. And occasionally I will throw a half second delay on a guitar solo, if it's something the guitar player can't get out of his rack to his satisfaction."

After almost nine years of work on the road, Davey Moire does look forward to a time when he can do more work in the studio. But it's not likely he'll be able to replace the excitement that can only be found when mixing for a live audience of thousands.

"When you engineer a studio album, your gratification is stretched out over the long term," he explains. "You have to wait and watch the charts. You have to see how it sells, read the reviews, and see how much airplay it gets. You wait four or five months to see how they liked your work. But with concert sound mixing, your gratification is instantaneous. You know immediately if they liked your work."

Going Up (Slightly)



Effective July, '84, *MR&M's* newsstand price will be \$2.25 and a year's subscription will cost \$18.00. So subscribe before July 1 and save \$3.00 on *Modern Recording & Music*—the magazine for people who create music.



David Sanborn

*have sax
will
travel*



After recording eight albums as a leader, not to mention countless solos on hit records for the likes of Linda Ronstadt, David Bowie and, most recently, the Rolling Stones and Pink Floyd's Roger Waters, saxophonist David Sanborn has earned himself a reputation worthy of his singularly recognizable sound.

That reputation—for unerring time, rhapsodic swing and a sweet yet masculine tone—has been won in a variety of situations, ranging from unbridled rhythm and blues to lilting country-rock to big-band jazz to pure pop. In short, Sanborn's metier is instant empathy: When called into the recording studio to enhance someone else's music, he responds quickly, emphatically and, most of all, sympathetically. Sanborn, who primarily plays a Yamaha alto but doubles equally well on soprano, shrugs off his session plaudits with an all-in-a-day's-work attitude; his versatility, he readily admits, derives partly from luck and has been abetted by what he calls the "rabbit's foot syndrome."

Since leaving St. Louis, where he played "teen town" dances with bluesmen Albert King and Little Milton, Sanborn has become perhaps the most in-demand, oft-copied altoist in the business. After spending five years in Woodstock, N.Y. (where he performed with the Paul Butterfield Blues Band and arranger-bandleader Gil Evans), Sanborn moved to New York City in 1974. Wasting little time, he made his mark—on the road or in the studio—with Stevie Wonder (*Talking Book*), James Taylor ("How Sweet It Is"), David Bowie (*Young Americans*), Paul

Simon ("Still Crazy After All These Years") and the Eagles ("The Sad Cafe"), among others. In the unlikely event you haven't heard his work with these artists, you've surely heard him play the theme song on the original *Saturday Night Live* television program.

Sanborn, who credits Hank Crawford, former altoist for Ray Charles, as a major influence, recorded his first solo album for Warner Bros. in 1975. Although his early solo efforts sold respectively, it wasn't until 1980 and the release of *Hideaway* that Sanborn hit his stride. Clearly his watershed, *Hideaway*, featured his own compositions for the first time and matched him with keyboardist Michael Colina and engineer Ray Bardani. The three worked together again on *Voyeur*, which not only topped the jazz charts but also earned the altoist a Grammy Award for best r&b instrumental.

His eighth and most recent album, *Backstreet*, was co-produced by Colina, Bardani and fast-rising bassist-composer Marcus Miller. *Backstreet* found Sanborn's tone unchanged. However, his studio approach (and the technology employed) signalled a departure. For the first time he used the Linn Drum (programmed by Miller) and recorded his saxophone apart from the rhythm section.

The thin, dark-haired saxophonist is playing in more jazz contexts these days, but while his playing often involves improvisation, he considers himself more of an r&b and pop-styled player than a jazz musician. "I never got fluent in the bebop vocabulary," he notes, "because I didn't have the practical experience of playing it."

Interviewed in his apartment on Central Park West in Manhattan, Sanborn described his latest album and noted that his participation on the Roger Waters' disk (on which he and guitarist Eric Clapton are the principal soloists, a juxtaposition he called "anomalous" but successful) represented the fulfillment of a longtime "dream."

Modern Recording & Music: Was recording with the Rolling Stones [on *Undercover*] different than you had expected?

David Sanborn: It was pretty professional. It was very straightforward, just like, "How are you? Here are the tunes. This is what we have in mind." Mick Jagger and Ron

Wood were the only people there. It was surprisingly low-key. There was no major insanity, carrying on or craziness.

MR&M: Had you heard the material before you entered the studio?

DS: They sent me a cassette earlier in the day.

MR&M: How often do you go into the studio cold, without having heard the tune on which you're expected to solo?

DS: More often than not. I usually go in cold. Sometimes people will send me a tape.

MR&M: Do you prefer having the tape in advance?

DS: It's funny, I always ask for it, but when I get the tape, I tend *not* to listen to it. Or I listen to it once or twice and I get an idea. I very seldom find myself *working* on something before the fact. I'll just maybe sit down and listen to it and figure out the key it's in. It usually doesn't seem to help. I can't think of a situation where it's been any great benefit, where it's facilitated things. Most of the stuff I'm asked to do is pretty simple. I don't have much difficulty with it. It's pretty much straight ahead, like rock and roll, r&b.

MR&M: The Stones tunes, being r&b at root, didn't pose any problems for you?

DS: One of them ["Too Much Blood"] was just one [chord] change. Actually, it was kind of hard for that reason. It was in a weird key, and I got into this repetitive thing. I couldn't really break out of it; it was in D flat. I kind of went in and out throughout the tune. The other one ["Pretty Beat Up"] was a solo, on a backbeat, blues thing. That was a little more structured. I played fills at one point; then I did a solo, then I played a fill, then I played the end. I did maybe two takes on that.

MR&M: How much direction did the band members give you about the tunes?

DS: They were pretty clear about what they wanted. Yet, at the same time, they were very loose about allowing me to do what I wanted. They said, "We think you ought to hit right here. I'd like you to catch this accent here." They gave me the places more or less to play, but they let me work around the mood and framework of the tunes. I'd do something and they'd say, "We like that. Why don't you try to develop that idea?"

MR&M: How often have you

recorded parts for other people's albums that were ultimately discarded?

DS: That happened once or twice. I did something once for a Quincy Jones record. I don't remember what the tune was. They dumped it. I think I was probably out of tune.

MR&M: Of course, there's nothing unethical about that.

DS: No, there's nothing unethical about it. It's always a little kind of ego thing. But, hey, in that respect it's a business. People are entitled to do whatever they want with their music. Whatever serves the music best is what they should use.

MR&M: *Backstreet* is a very different-sounding album. Did you set out consciously to alter your approach?

DS: It's a little different than any other albums. It's more kind of "inside" pop. We used the LinnDrum machine quite a bit on it... It's hard for me to evaluate [the album] because I'm so close to it. I think it has more of a pop sound than my other albums. I think I'll take a different direction the next album.

Marcus Miller programmed the LinnDrum, played bass, most of the guitar, and synthesizers. Hiram Bullock played guitar on one of the tunes. Steve Gadd and Ralph MacDonald overdubbed drums and percussion [respectively] on a couple of the tunes. But it's pretty much just Marcus and myself.

MR&M: That approach marks quite a departure from your previous solo albums. In the past you recorded in the presence of the musicians, at least the rhythm section.

DS: Yes. I'll tell ya, I kind of miss playing with other people. Not that I'm dissatisfied with *Backstreet*, but I think this is probably the last album I'll do that way. I like the interaction of other musicians; I think I need that.

MR&M: Why, then, did you do the album without a "band"? As an experiment?

DS: It was an experiment to see how it would work out. There are positive and negative things about using the Linn machine. The positive thing is that you know exactly what you're getting. You can program very specific things, things you can't get a drummer to play. But the negative side is that a machine doesn't breathe. A machine is not a human being.

As difficult as it is to overdub to drums prerecorded, it's that much

more difficult to overdub to a pre-recorded drum machine. Improvising is very difficult. It tends to lock things in. We laid down the drum tracks first. Then we overdubbed the bass, then we overdubbed the keyboards, then I [recorded the sax].

I prefer to have real live drums there. Most of the *As We Speak* album we did live, with Omar Hakim on drums. He's a wonderful drummer. And I played most of my solos live in the studio in the presence of the rhythm section. There are a few things that I "fixed"; in a few places I punched in a couple of phrases.

MR&M: The kinetic quality of your sax work seems to stem from the personal, shared mood you create with your sidemen in the studio. Did the absence of such a scene inhibit your playing?

DS: It did a little bit. It's funny, I didn't realize until I was pretty deep into the project what a problem that was. For that reason, I will limit my use of rhythm machines.

MR&M: When last we spoke, you mentioned that you get your best musical ideas when you are around the means to express them—a nearby piano or saxophone—but under no obligation to do so.

DS: Absolutely. When I just free-associate, and have a minimum amount of pressure to come up with songs for an album, it's a lot easier for me.

MR&M: Yet you obviously work well under pressure when you're in the studio cutting a solo for someone else's record.

DS: Somehow it's easier to do that because there doesn't seem to be as much at stake. The parameters are a lot narrower. You kind of have to sublimate yourself and your own musical ideas to someone else's musical ideas. So you have to operate within a fairly restricted framework; whereas when you're making your own music, the options are unlimited and the doors are open for you to go wherever you want rhythmically, harmonically, whatever.

You need some kinds of restrictions on you to do your best work. When you know you *can't* do something, that makes it clear that you have to do something else.

MR&M: Now that you've recorded your eighth album as a leader, are you feeling more comfortable in the recording studio, or are [the studios] so dynamic and ever-changing that each time out is a totally new experience?

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DS: There's a twofold answer to that. Things are changing at such a rapid rate that sometimes it's hard to keep up with all the latest developments in technology. And I think sometimes it's easy to get enamored of certain kinds of technical developments at the expense of the music. It's easy to get caught up in, "Gee, look what we can do," rather than remembering that what those things are there for is to help you communicate the music as directly as possible to the listener.

Sometimes the more options you have, the more confusing it is. When you have 1500 choices instead of just one, you can sometimes lose the flow, because you hesitate at every juncture. I was talking to [saxophonist] Mike Brecker about this one time. He was saying, "I wish I could play as simple as you play on some of those rock records." I said, "That's because you *know* too much! You come to a chord change and you can think of 15 things to do, whereas I only know one thing to do, and I go ahead and do it."

At the beginning of recording [*Backstreet*], we made a conscious decision to give it a certain sound, and I think we stuck with that idea throughout the album. Not having had experience with the machine prior to this album, I learned as I went along about some of the advantages and disadvantages of using the drum machine. On previous albums, *Hideaway* for example, I've played piano to a click track, and then we'd overdub drums. So I was not unfamiliar with working to a metronome, to a click. But I was unfamiliar with working to a synthesized drum sound, a very sophisticated metronome.

MR&M: Sophisticated, yet to these ears, mechanical. And rhythm is your forte—you have a rhythm sound all your own.

DS: That's one of the nicest things Gil Evans ever said about me. He said I had great time.... One of the problems I had with the album was playing to a drum machine which, to me, still simulates a real drum. As sophisticated as it is, I was unable to really get into it for its own sake.

MR&M: You've never used many electronic effects on your saxophone, either.

DS: No, I haven't. Sometimes I've added wah-wah.

MR&M: From the board?

DS: From the board. I actually play with my hand. But I've kept that to a minimum because [the acoustic

sound] is essential to whatever I have to give. I don't have great gifts as an improviser. I have a certain lyrical sense, and I have a certain sound, and I have a certain rhythmic sense which has a certain immediacy. And I think that is best communicated acoustically.

MR&M: Although electronic modifications are incidental to your sound, what effects besides wah-wah have you used?

DS: I've used flangers, phase shifters of various sorts...post-performance. I can't think of one instance where I've used something [attached to the horn] as I've played. I've always used these things after the fact, and always to add some nuance or to bring out a quality that was already there, rather than to change it—to bring out something that maybe was too subtle or wasn't audible enough. But never, or very seldom, to mess with the sound.

MR&M: What microphones do you favor?

DS: I use the Sennheiser 441 and 421 for live performances. The 441 I tend to use for small-to-medium places, and the 421 I use for larger halls. I use them almost exclusively. I find those to be very satisfactory mics. In the studio I use Neumann. I particularly like the U47, the old tube U47. I like the Sony C37. The Neumann or Telefunken U47 has a beautiful, warm riff sound. The Neumanns are just good, standard, you-know-they're-always-going-to-be-there microphones.

MR&M: Very dependable.

DS: Very dependable mics. I sometimes use ambient mics for room sound. I've used Crown PZMs taped to the glass to pick up sound. I've used Electro-Voice, but primarily I use the Neumanns, the U47 being my favorite.

MR&M: What room requirements do you set?

DS: Generally, I like to play in a room with a good live sound to it, where I can get some good room sound that I can hear back. Although Minot [in White Plains, N.Y., where *Backstreet* was recorded] is not a particularly big room, it does have a good live room sound.

MR&M: Over the course of your eight solo albums, you've used a variety of producers, among them John Simon, Phil Ramone, George Massenburg and, now, Marcus Miller. Do you envision producing your own albums in the future?

DS: I've been involved in the

MODERN RECORDING & MUSIC

David Sanborn Discography

production, but not credited. I tend not to like that aspect of the work. I took probably my most active [production] role in *Hideaway*. I tend to lose interest at a certain point in the process. It gets a little tedious and I tend to drop out, and I would not want to take credit for something I didn't feel I fully participated in. Even though I am active in all stages of recording, down to the mastering, I hesitate to take on the role and function of producer. It's not [a role] I can do and keep my perspective.

MR&M: You're taking your band to Japan in January and you have scattered U.S. dates in between, including a concert at Carnegie Hall. Do you employ a soundman for live performances?

DS: Absolutely. Ron Lorman is someone I use. And also Mark Wissing, who's excellent.

MR&M: You mentioned that you're active in all stages of recording. Do you have comparable involvement in the staging of your live dates?

DS: I pretty much just show up and do the soundcheck.

MR&M: Since you're obviously highly in demand [as a session player], what criteria must a date and the leader of that date have for you to accept the assignment?

DS: If it's somebody I wanted to play with for a long time, the Rolling Stones for example, I would take it in a minute. Or if someone I know is producing an album. For example, I did a session for Roger Waters of Pink Floyd. I did it for a couple of reasons: Number one, I wanted to play with Roger Waters; the other reason is that a friend of mine, Michael Kamen, was co-producing the album and asked me to do it. I said, "Well, if you're producing, I'll do it." So if I know the producer and he shows me that it's a good thing, I'll do it. Arif Mardin I'll always work for, Bill Szymczyk I'll always work for... Phil Ramone.

MR&M: So, in other words, the producer can be as important a criterion as the artist.

DS: Yes. Phil will call me up and say, "Listen, there's something I'd really like you to do." And I'll do it as a combination of a favor and also because I trust his judgement.

MR&M: Do you ever take the initiative and call people up to volunteer your services, saying, "I'd love to work with you."

DS: I can't think of any situation where I've done that, although there

As a Leader

Taking Off. Warner Bros. BS-2873

Sanborn. Warner Bros. BS-2957

Promise Me The Moon. Warner Bros. BS-3051

Heart To Heart. Warner Bros. BSK-3189

Hideaway. Warner Bros. BSK-3379

Voyeur. Warner Bros. BSK-3546

As We Speak. Warner Bros. 9-23650-1

Backstreet. Warner Bros. 9-23906-1

are plenty of people I'd be willing to record for in a minute. Miles Davis is one. I don't think that will ever happen because I'm just not in that circle of people. I'm not that kind of player.

MR&M: Who are some of the others?

DS: If Paul McCartney asked me to play on his record, I would. Certainly. But I haven't really had to go out and solicit work too much. And, also, I would be very bad at that because I'm not good at hustling. I've been very lucky in that people have come to me; they've heard me on other records.

MR&M: And it's been that way, has it not, almost since you arrived in New York 10 years ago?

DS: Yeah...since I played with David Bowie and James Taylor. Those were some of the early things I did in 1973, 74.

MR&M: Would it be fair to say that, besides your unique rhythm sound as a saxophonist, some of your success can be attributed to timely referrals, to being in the right place with the right person at the right time?

DS: Absolutely, there's no question about it. There's also the rabbit's-foot syndrome—people thinking, "Gee, he was on this hit record. If I put him on my record, maybe mine will be a hit, too!" And a lot of it is respect for my playing, which I appreciate a great deal. The Eagles asked me to play on

The Long Run, which has turned out to be their last record. That was a combination of knowing the producer, Bill Szymczyk, and also knowing a few guys in the Eagles.

MR&M: When you screen the offers, what are some of the dead giveaways that the project isn't worthwhile?

DS: If they say, "This will only take an hour." If they say "trust me" or "no problem." Those are three dead giveaways.

MR&M: During the weeks or months that you are writing or recording one of your own albums, do you also do work for other artists?

DS: I tend to be much more selective. Maybe if I'm getting too obsessive about one of my tunes, I might take a date from somebody that musically will free me up, take my mind off what I'm doing.

MR&M: What temptations do you try to resist in the studio?

DS: Doing things too many times. The opportunity to keep on recording and do takes and to lose the excitement is one of the greatest temptations in the studio and one that has to be most assiduously avoided. By doing things to death, wearing things out and overdubbing too much, you can lose the spark that is the music. When you correct a solo just because you didn't like one or two notes you played, you can lose the flow and real character of what it is.



Don Felder

Flying Solo

Former lead guitarist for the Eagles, Don Felder—who added a harder rock edge to that group's country tone when he joined in '74—strides into the offices of his Los Angeles-based management firm soaked from the torrential downpour outside. Although only 10 minutes or so late, he is apologetic.

Shaking the rain from his jacket, he glances around for a thermostat in the chilly room, asks for a cup of coffee to warm up with—southern Californians abhor any kind of cold—and settles into a chair to discuss his premiere solo LP, *Airborne* (no grounding this Eagle outside the context of the group).

Although unavoidably "Eagle-esque" in some regards, the album is more lighthearted than any of his counterparts solo efforts. However, each of the band members have lightened up from their days with the socio-politically outspoken Eagles.

Felder recorded the LP in a studio recently constructed in the guest house of his Malibu estate, a project he attempted to convince fellow Eagles band members to undertake years ago. This luxury, he says, allows him time to eat dinner with his family and watch his children—ages 1 through 10—growing up.

Boasting his own production credits, Felder approached his initial solo project as if it were an electronic jam session, inviting a number of well-known musician friends and session players.

Here, Felder talks about his time with the Eagles, recording with and without the group, the construction of his new studio, the tone of *Airborne* (Asylum) and his family.

Modern Recording & Music: *Airborne* is your first recording effort apart from the Eagles. Are you pleased with the results?

Don Felder: I'm real happy with the way it turned out. Three of the songs on this record were songs that I had written for *The Long Run* and that the Eagles had attempted to record. We made several attempts at writing arrangements, but it never quite fit the material. I shelved them until I had the opportunity to do it myself. I wanted to control the way things came out and I enjoyed that. (Joe) Walsh did the same thing, as a matter of fact. He wrote "Life's Been Good" for *Hotel California* or *The Long Run* or something. Everyone said, "Well, I don't know..." He recorded it himself and it was a pretty successful record.

MR&M: It seems that you enjoy recording on your own, away from the grueling schedule and recording boundaries imposed by the Eagles.

DF: It was really nice to work when I felt like allocating the time to do it. I didn't have to remain within the structure of so many other people and their schedules or have to work such long hours on a consistent basis. It was real comfortable to be able to do it at my leisure and not feel that I had to crank it out in six months or whatever. I recorded some of the songs as many as three times. My record took over a year to do, but I really broke it up with other projects. I did songs for three movie soundtracks and did a lot of skiing in the winter. I have my own 24-track studio, and if I did something I really didn't like, my eraser head on the tape recorder worked great; it just went away into the unknown. When I did stuff I liked, I kept it. I re-did some of the songs three different times with different players; redoing basic tracks or vocals until I got something I really liked, and that was the finished product.

MR&M: It's been well-publicized that the Eagles were under tremendous pressure to "top" the multi-platinum success of *Hotel California*, taking the group to the breaking point during the year-long recording of *The Long Run*. So it becomes quite apparent from the conversation, that now you're out for fun.

DF: There's no point to being under pressure in my career now. That's what felt really great about making this record. I wasn't under the pressure I was coming off *Hotel California* or *The Long Run* and

having to put something together that equaled or surpassed the last effort. I don't think anyone in the band is capable of doing that individually. And I don't think the public particularly expects any individual band member to be able to do that. I let all the pressures go and went skiing when it got tense. Or when the wind was blowing, I'd take off and go to the beach and go windsurfing. I took it on a real casual basis, but I still concentrated on the final product and making it good. I just refused to make records in the same way I had in the past. It takes too much out of you.

MR&M: What were some of the sideline projects you spoke of earlier?

DF: I wrote a song with Kenny Loggins for the soundtrack of *Fast Times at Ridgemont High* called "Never Surrender," which is also on [Airborne]. The soundtrack was packaged as a double album and retailed at almost \$15. It came out in a period when the record industry was going through a major crunch and very few kids were willing to go out and plop down that much money. So, although the record did receive some airplay, I really wanted to include that song on my album. I also did a song for a movie called *Heavy Metal*. That was also a double album, but it sold 1,200,000, or something like that. I did two songs for *Nice Dreams* for Cheech & Chong, who is a good friend of mine. I also did some stuff for another friend of mine in Malibu who is a producer/director. I enjoyed making music that you kind of experience in a visual scene as opposed to making a record that has to have a hook melody or lyric. It's just a way to step outside of what I normally do and work on projects with friends that were fun.

MR&M: Do you feel that you attempted to retain or avoid an "Eagle-esque" sound in your solo work?

DF: A lot of people who heard the record said there are two or three cuts that really sound like what the Eagles would have recorded in the '80s. I really tried not to do that. I didn't want people to say, "This guy was an Eagle and here he is trying to make a record that sounds like the Eagles to claim that fame." I tried desperately to *not* do that. But if a guy writes a novel and then he writes two or three more novels, you'll recognize his style even though it's another story. It's just the way the guy creates or writes. I participated in a lot of the writing and arranging—mostly guitar parts—

in the Eagles. So, I think there's still some of that element in some of my songs. Although, some of them were so diverse that the Eagles would have never been identified with that kind of music. It was everybody's collective and individual input that really made the Eagles. And if you listen to any of the band members' solo work—from Walsh to Henley to Frey to me—it's completely different. It's anybody's individual input and their character that makes that Eagles' sound. It can't help but be different when one guy goes out by himself.

MR&M: Can you describe your playing style?

DF: I don't know how to describe it. I've never been asked that question before. I'd say it's pretty sloppy sometimes.

MR&M: What are your weaknesses and your strengths as a musician?

DF: My weakness is women and my strength is being able to stay up for two or three days in a row! (laughs) I'm just kidding. I guess my weakness is probably my engineering experience, 'cause I really don't know that much about it. The way an engineer treats a record has a great deal to do with the final product. He can make it sound great, but it depends on how he interprets the record. That's probably my weakest point. I think my real strength is the ability to take a kernel of an idea and develop it. I can arrange it and build it from just rhythm guitar into a finished product that sounds like a record. I don't follow any kind of set pattern to do that. I can just hear things happening and do it. That's what I really enjoyed about bearing the responsibilities of producer—the creative aspects. I was able to explore things myself as opposed to some other guy sitting there and saying, "Well, I hear horns here. Let's hire this stranger to play horns. Let's arrange this and that and do this, that and the other." I did it how I wanted it. That's a strength that I enjoy and that I do well.

MR&M: Wasn't it difficult to undertake your own production responsibilities? Didn't you miss the kind of objectivity that Bill Szymczyk provided for the Eagles?

DF: I wasn't ready to have another producer step into my creative process and dictate to me the way it should be done. I don't feel that Szymczyk knows any more or less about making successful records than I do. (laughs) At the same time, I don't know if you can keep your

At one point in my career I really thought that I wanted to do something more artistic; art for art's sake. Something over and above rock'n'roll. I was making great money playing in bands at fraternity parties and making records when I was 14, but I really wanted to be a respected artist and instrumentalist.

objectivity in the middle of all that. The whole process is subjective when you're the writer, the performer, and the producer, all at the same time. I did hire quite a few different engineers on the project to try and separate sounds: drums, overdubs and whatnot. I really relied on the engineering techniques and form of other people to obtain certain sounds for me. But as far as the way things went down—the arrangements and the ears that were put to it—that was all me. I just felt like they were my songs, my project and my album and I wanted to jump in and get my feel.

MR&M: Did you have any formal training?

DF: Yes and no. I grew up in Gainesville, Florida, and sort of took a few lessons there. Then a guy who had just returned from Berklee School of Music—where he studied composition, theory and arranging for six years—opened up a school teaching guitar composition, big band writing, piano and theory. I was hired by him to teach guitar to 12-year-olds who got their K guitar for Christmas in exchange for personal instruction. He taught me theory, composition and sight reading. I studied with him for about two years. Then I went to New York and was on Creed Taylor's label [CTI] with a jazz/rock fusion group in the late '60s. After beating the bushes in New York for about a year and a half—doing sessions, playing the Village Gate and doing that whole scene—I didn't want to live there any longer. So, I moved to Boston where Creed Taylor got me a job working in a

studio that he used as his frame team, where he could take people in that area—from the Berklee School of Music—bring them in, and let them do tapes. He found new acts and players that way. So I sat up there and learned how to make records and produce. I was staff engineer, guitar player and arranger. I did everything. (laughs) At that point, I learned a great deal about making records. I really wanted to study more. So I went over to Berklee and met with the guy who was head of the guitar department. I sat there and played for him and he offered me a teaching job. I didn't want to teach freshman. (laughs) I wanted to study. He thought that I should just pick up a few textbooks on the side and go through them, rather than waste my time and money in class. He told me there was little to teach me.

MR&M: Who were your influences?

DF: The first people who influenced me were guys like James Burton, who played with Elvis Presley, and the guys who worked with the Everly Brothers. All of the '50s and early '60s guitar players. That's where everyone kind of got their framework. Then everybody learned from the wonderful invention of the Ventures' twang bar, playing it at fraternity parties, etc. When Clapton came out, he was obviously a big influence. Then I began listening to a lot of jazz players, like Wes Montgomery, people playing jazz guitar. At one point in my career I really thought that I wanted to do something more artistic; art for art's sake. Something over and above rock'n'roll. I was making great

money playing in bands at fraternity parties and making records when I was 14, but I really wanted to be a respected artist and instrumentalist.

MR&M: How did you come to join the Eagles?

DF: When I was in Gainesville, Stephen Stills and I had a band called the Continentals for about a year and a half. Then he split for California. Bernie Leadon moved from San Diego to Gainesville because his father is a nuclear physicist and there is a large nuclear research division at the University of Florida. Bernie was this little banjo player who played flat-picking bluegrass and a little mandolin. He came to town, went into the music store and asked who was hot in town. He wanted to meet me, and picked me up at a bus station one day after I had been up in Lake City playing at a little junior prom by myself. I was about 15 years old. We got to be real good friends and he filled Stephen's slot in the Continentals. We fired a couple of guys and hired new guys, renamed the band and worked together for about two and a half years until he got out of high school. He bummed around Gainesville for about a year and then went back to California. He wanted me to go along, but I said, "Well goodness, I'm a little Gainesville boy and I can't just leave everything I know and go off into the world." I wasn't ready. He kept calling me from California and coaxing me to come out, telling me about the work everywhere, gigs, clubs, people on the road and making records. He joined the Flying Burrito Brothers and every time they came through Jacksonville, I'd go over and see them. Finally—after I had gone to New York and Boston—the Eagles had put out their first album and were appearing in Boston. I didn't know those guys from Joe Schmo, but I went to see Bernie, went backstage and jammed in the dressing room with them. Frey and Henley told me I should move [to California]. I was doing okay, but I finally gathered up about 700 bucks, rented a U-Haul trailer and drove out. I was working a job with Crosby and Nash as their guitar player and backup singer, filling in Stephen Still's parts. I came off a tour and the Eagles asked me to play on the record *On The Border*. I went down and played a slag guitar part. They called me the next day and asked me to join

the band. I was about 21 or 22 and said, "Hey, okay."

MR&M: How do you approach recording in the studio?

DF: Having my own studio enabled me to try anything I wanted; I tried to do things in completely the opposite way the Eagles made records. The Eagles would start writing a basic song, the start of an idea. We would rehearse it and get it to the point where it was a nice arrangement. Then we would go into the studio and start recording and overdubbing strictly on 24 tracks. We limited the overdubs, to a certain extent, within the framework of 24 tracks. As an individual artist, I deliberately didn't put a band together and write, rehearse and cut the songs in the

whoever the guy was playing that day who played really well in the particular group and sounded right for that tape. Then I would erase the LinnDrum, because I had a real drummer in the lineup. Then I would have bass players come in on successive days until I found the guy who just played spotlight bass. When I had a drummer and a bass player who were happening, I'd bring in keyboard players. We would sit there and write synthesizer parts. Finally, when I got keyboards, bass and drums, I would sit down and do the guitar stuff myself. When I got through that, I had literally assimilated—piece by piece—what sounded like a band playing together. But, in fact, it was done track by track.

process and select what coverage they want for the master.

MR&M: Did you use a lot of special effects?

DF: I did a lot of backwards stuff with multi-tracking. I did backwards effects on guitars, as on "Who Tonight." There are backwards synthesizer effects on "Still Alive," and I did a little while synching parts that were recorded from different slaves of different arrangements of the same song. That was possible because they were in the same key and had the same tempo. I could take something that was great and synch it into the master. There were a lot of unorthodox approaches to things.

MR&M: Why did you decide to build your own studio, Radical Records?

DF: I have two and a half acres in Malibu. Originally, it was a large guest house where the Eagles used to rehearse. I used to have a little eight-track Otari and we would wheel this little Tascam model five console into the master bedroom, which served as a control room. We'd move all the stuff out of this other huge room that was about 25 by 40 feet—I bought the house from Tommy Chong and he had made this room into a living room or pool room or barn or something—and that's where we would set up the band. We would write songs and rough through them and make our tapes. Those little half-inch eight track tapes sounded good, because the room we were recording in sounded good. As a matter of fact, I tried to get the Eagles to build this studio about five years ago, right after we had finished *Hotel California*. I saw the bottom-dollar budget cost on that album, which was well over one and a half million dollars. I thought it was ridiculous that for half of the price of one album, we could buy a building, equip it, and use it as much as we wanted, and rent it out when we weren't using it. Well, the band members said, "We don't want to go into the studio business, so we'll make another album and have it cost another million and a half dollars." So, I decided to put a studio into my place. It was primarily built by Rudy Brewer's construction company, which built the Record Plant in Los Angeles and Bayshore down in Miami, where the Eagles used to record. He also built Rumbo Recording out in the valley for the Captain and Tenille. I felt if I was going to build a room, I might as well have the

Bernie (Leadon) was this little banjo player who played flat-picking bluegrass and a little mandolin. He came to town, went into the music store and asked who was hot in town.

same way. I know how the final product ends up through that process. I guess I kind of did things backwards. I spent a lot of time around a producer named Albhy Galuten, who produces the Bee Gees. He gave me the idea of taking a basic drum machine or a basic click track and building an arrangement for a song by yourself, step by step. So I would take a rhythm section like a LinnDrum and record it on a sequencer. I would sit there and write a basic bass line and keyboard part and then play a couple of real rough rhythm sketches and put a rough vocal on it. Eventually, I had a demo on one tape. Then I would take it and make slaves—transfers—of that tape master onto a 24-track slave and stripe it with SMPTE (time code), so that the two tapes would lock up together. I would make four or five copies of that same song. Then I would bring in maybe four or five different drummers, set up and play drum parts against that track until I found whether it was (Russ) Kunkel or Tris Imboden or Carlos Vega or

MR&M: So basically, it was an electronic jam session.

DF: Yeah, right. It enables you to do a lot. Say you have a slave of a basic track. When you get toward the end of building your instrumentals, you have four basic tracks and one track for SMPTE to lock your machine up. That leaves you like 19 tracks to do background vocals on. So, one day I had Timmy Schmit come out and he would sing 14 background parts, three primary parts, three harmony parts and three parts of the third harmony above that. Then he took another 12 tracks and sang ooos against it. I would have Kenny Loggins come in and sing the same parts. So I would take two of Timmy's voices and two of Loggins' voices and two of my voices and mix them into a group of two to four tracks that sounded like Timmy, Kenny and I had gone out there and just sang this incredible performance that blended together perfectly. It's sort of the way that people make films. They shoot certain scenes and camera angles and then they go into an editing

same guy who had built the studios I had been living in. That way I wouldn't walk into a control room and have it take me a year to get acclimated. He did a wonderful job. We moved a few walls here and there and basically converted this master bedroom—which is about 20 by 30 feet—into the control room. We changed a few walls in the studio part, floated the floor and whatnot and made it into a basic studio. It works out great. It's about a 100-yard walk across the lawn and it's close enough that I can stop for a break and eat dinner with my family and come back to work. I spent a lot of time out of town recording with the Eagles. I have four children and they were basically growing up without me around. They were spending a lot of time traveling to see me on the road. I just felt that I needed to be around my family. Also, I really wasn't looking forward to getting into a car and driving into Los Angeles every day and then back out.

MR&M: Can you detail the equipment in the studio?

DF: I made my contacts with MCI when the Eagles were down in Miami and I began negotiating with them to have the Eagles endorse their advertising campaign in exchange for reasonable purchase prices. When we decided not to build the studio, I told them I might decide to do it myself and they said they would give me the same deal. It was right about the same time that Sony was purchasing the company and I ended up getting a very, very reasonable price from the MCI people. That was the equipment that I learned to make records on and I knew the way that things sounded on that gear. I figured with the same equipment the Eagles had used and the same type of room that Rudy Brewer built, I couldn't go wrong. So I bought MCI. I bought a JH536D console and a JH-24-track tape recorder. I have UREI 813A time aligned studio monitors. I bought a whole slew of outboard stuff in the way of Lexicons and echoplates and that sort of thing. I also bought some UREI limiters. I have some George Massenburg stereo equalizers that I use a lot.

MR&M: What guitars are you playing?

DF: I have about 76. Through the course of the Eagles, I collected tons of instruments; antique instruments and instruments that have been converted with different wiring, pickups and active preamps. I would

take a guess that I used about 30 different guitars on this record. If you use the same Stratocaster or Telecaster for rhythm guitar parts and then for solo parts, pretty soon everything on the record starts sounding the same. The one element that existed on Eagles' records was that every time we played another song, everybody played a different instrument—even on stage. On stage, everyone got a new guitar and a different amp—and consequently a different sound—on each song. That helps a record sound unique from cut to cut. Even though it may be the same people playing with the same expressions, the total characters are different.

MR&M: Do you have any favorites that you use most often?

DF: I have a couple of Fender Stratocasters that I like a lot and a couple of '59 Les Pauls that I also use a lot. I have a guitar that some guy gave me when we played Japan the last time. I was leaving the airport and this Japanese guy came up and handed me this cardboard box and said, "I made this guitar for you in my garage and I really hope that you like it." So, I thanked him graciously and came back to the U.S. and threw it in my locker at SIR (Recording Studios). I was down there one day, cleaning out my locker and just looking through all this stuff piled around there and I thought, "Well, I wonder what this thing looks like." I got a razor blade and opened up the case and took it out. It really looked like somebody was looking in a mirror when they designed it. Everything was kind of upside down and backwards and just looked very bizarre. I threw it in my car, took it home and plugged it in to see what it sounded like. It sounds and plays really great. I couldn't believe it. The guy who made it is named Mooney. But it doesn't have anything written on it. It's just a garage guitar. It has two pickups and it sounds like something between a humbucking Les Paul and a single-coil Stratocaster. It fits right in the middle. So, if you use a Stratocaster for the rhythm parts and that thing to fill in—alternating parts against it—and the Les Paul for lead, it really gives you three separate characters. You can't get that without using some other type of guitar. It's really neat sounding. I haven't been back to Japan, but when I go, I'm going to take him a special gift. I had no idea when he said he had made it in his garage (laughs) that it was

going to turn out to be such a neat instrument.

MR&M: Are you planning to tour?

DF: I'm not really crazy about touring. For one thing, we spent a good 10 years with the Eagles out of town on the road and in the studio. I've seen every steel-doored Holiday Inn in America at least three times.

MR&M: And been thrown out of most of them at least once.

DF: Yeah, right. (laughs) It's just that I'm not wild about touring, but I really like to make records. It's exciting and it's creative. It's not just walking out and doing the same show over and over and playing all that crap—although I do enjoy playing for live audiences and seeing the enthusiasm. But I just prefer to go back into the studio. I'll do it if I have to, but only if I *have* to.

MR&M: You mention that you would like to stay off the road to spend more time with your children. Are they musically inclined?



DF: I think they all are. I have a little boy who is almost 10, a little girl who is almost eight, a little boy who just turned five and a little girl who is almost a year old. I haven't given any of them formal lessons or pushed it. But they all come over to the studio and they like the synthesizer. I showed them how to turn it on and they love to make sounds and noise and figure out little songs. I think that's the way I learned, through my own desire rather than being forced to take piano lessons and practice. It just seems like more fun and less work until they really get to the point where they want formal training.

MR&M: Would you be sorry to see any of them follow in your footsteps?

DF: No, I don't think that any of them should ever assume the dream that they will become rich and famous. After years and years of struggle, some people still end up playing in a club or just doing gigs here and there. But if [my children] want to, and they're happy with what they're doing, I certainly won't discourage them from it. As long as they're well aware of what the lifestyle entails on a normal basis for what most people get out of it. But, if they want to do it, that's fine.

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Sound Advice

Cords, Cables, and Connectors

Cables and connectors, carrying power and signals between various components, are the lifelines of your sound system. It's been said that any chain is only as strong as its weakest link, and this certainly is true in regard to your cables and connectors. Cords are simple and relatively inexpensive components, yet a faulty one can often prove to be the Achilles' heel of your sound system. It's like having a car with fantastic wheels and less than ideal lug nuts that won't hold them on. It just doesn't make sense to invest a small fortune in sound equipment that cuts in and out or buzzes unnecessarily. So, this month we are going to address the subject of cords, cables and connectors in the hope that you may be able to improve your collection of "lifelines" and the way you use them.

We will begin with a brief description of the connectors commonly used in audio work.

XLR, Mic, or Cannon: Most commonly used with microphones and for connecting them to snake boxes, these connectors can also be used with patch cords and for carrying line level signals between mixing boards and signal processing equipment. Manufactured by Switchcraft, Cannon, Neutrik and others, they are compatible with cable that is up to 1/4-in. in diameter. A 3-conductor connector, the XLR is the only signal-carrying connector that locks, and is considered to be very durable in PA applications.

1/4-in. or Phone Plug: Most commonly used with instruments and speakers (where it's a 3-conductor connector) and headphones (where it's a 2-conductor connector), the phone plug

can also connect signal processing equipment. Manufactured by Switchcraft, Neutrik and others, it is compatible with most shielded cable and speaker wire up to 16 gauge. With many levels of quality on the market, we've found that the best 1/4-in. connectors are reasonably durable.

RCA or Phono Plug: Originally developed for use with home stereos, the primary advantage of RCA connectors is their compactness. Manufactured by many companies, they are compatible with small shielded cable. A 2-conductor connector of limited durability, the phono plug is sometimes found on mixing boards where their size permits a larger number of connectors in tight quarters.

Twistlock: Originally (and primarily still) used for carrying AC power, sound equipment manufacturers have recently discovered the twistlock's excellent application as a speaker connector. It mounts nicely, accepts large-gauge wires, is very durable, and is easy to wire without solder. Manufactured by companies like Hubbell and Arrow-Hart, it is compatible with 12 to 16 gauge SO and SJO cables. Twistlock connectors come in 2-, 3- and 4-conductor configurations.

Banana Plug or Binding Post: Usually used on the output section of power amps, this connector is commonly wired to a twistlock connector on the outside shell of an amp rack. Manufactured by Pomona, H. H. Smith, and others, it is compatible with 16- or 18-gauge speaker wire. Fairly durable, it is usually applied in situations where it isn't disconnected often.

Multi-conductor: These connectors

come in a variety of configurations. In sound work, they are most commonly used on snake boxes where you'd want to be able to disconnect the box from the snake cable or have the option of adding extra cable. Manufactured by Cinch, AMP, Cannon, Switchcraft, Amphenol and others, it is compatible with a variety of cables, depending on its application. Its durability varies.

There are many good cords on the market today, but constructing your own will provide an alternative that allows you to customize your cords by combining different attributes of cables and connectors. Many connectors come with instructions on how to wire them to cable, but we'd like to discuss some basic aspects of cord construction, one of which is soldering, the process often used to join a cable to a connector.

Soldering

Basically, wires from the cable are connected to pins, inside the connector by fusing them with heated solder, which acts as a conductor and binding agent. We can't stress how important it is to solder correctly. You won't want to end up with connections that fall apart from cold solder joints or cracked solder.

One of the most important prerequisites for good soldering is to have the right tools. The type of solder used almost exclusively in sound equipment is 60-40. Solder comes in different gauges; .05 works well for electronic work. We recommend using a 40-watt pencil-type soldering iron. It heats up quickly, is easy to handle, and allows you to get into small spaces. A 25-watt iron will work, but with less heat-generating

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capability, it works more slowly. And, the longer it takes to melt the solder, the greater the chance is of damaging the insulation on the cable. It's better to get on and off your connection quickly. It's advisable to have a damp sponge on hand to frequently wipe the tip of the iron to keep it clean and in ideal condition to make good connections. When connecting cables, be careful with the amount of insulation you strip back. Remove just enough to make your connection; too much bare cable is liable to short out when flexed. We don't recommend insulating your connections with any kind of tape; it generally won't hold very long, and will turn the inside of your connector into a gummy mess. Most connectors come with an insulating sleeve; just make sure to position it correctly. We also recommend using thread lock, a solution available at hardware stores, on any retaining screws that hold the connector together. These tiny screws have a tendency to work themselves loose, and the thread lock will help keep them intact.

Another useful accessory to have on hand is heatshrink, a strange substance that strengthens and insulates connections. In the form of a tube, it can be cut to the proper length and slipped over the outside of the connector and wire. When heat (as from a hair dryer) is applied to the material, it shrinks in diameter, tightening over your connector and cable, adding extra strength to the total assembly. If you use ID tags on your cords, you can use clear heatshrink over them on the outsides of your connectors.

Wiring

When wiring cords, it's essential that you connect the proper wire to each pin. Test cables right after you wire them to check for continuity and correct polarity. There are standard color codes for electrical wiring. In microphone wiring, for instance, pin 1 on the connector is always the shield (a bare silver wire), pin 2 is always black, and pin 3 is always white. When wires are not dissimilar in color, as with 2-conductor speaker wire, there should be a tracer ridge running down the edge of one wire so you can identify the hot and ground.

Be careful to choose the right type of cable when constructing microphone cords, patchcords, or speaker wires. All microphone and patch cords, as well as instrument cords,

must use shielded cable, which has a metal layer under the outer casing that completely surrounds the wire (or conductor) inside the cable. These wires inside the shield are usually called the "center conductors" or "inner conductors." The shield protects against hum or buzz that might be induced into the inner conductor. The more the shielding, the better the protection against unwanted noise. A foil shield is one of the best; braided shield is also common, especially in microphone cords, because of its durability. However, braided shielding must be unbraided to solder it to connectors, and this can be time consuming. Spiral shield is all right for patch cords (which carry line level, *not* mic level signals) and is very easy to work with.

It's important to retain as many strands of actual shield wire when soldering connectors or you might end up with a noisy cord. Make sure the strain relief (outside casing of the plug) grips the outer casing tightly, so that when the cord gets pulled, the strain relief will bear the brunt of the stress.

Maintenance

As far as handling these lifelines of your sound system, the care they receive will help determine their longevity. Speaker wire and AC cords, which are durable and strong, can withstand being wrapped around your forearm in straightforward loops. Microphone cords, on the other hand, are a bit more fragile and deserve more care in handling. The fold-and-tie method (where 4- or 5-foot lengths of cord are laid out on the ground, gathered and tied in a loose knot), and the inverted coil method (where shorter loops of cord are made on the arm with a half twist put into each loop) are both recommended. These methods of storage put less strain on your mic cords by distributing the stress more evenly. It's not recommended that you use duct or any other kind of tape to secure coiled cords; eventually the sticky residue from it will help dissolve the casing. Soft cotton clothesline, cut in appropriate lengths, serves the purpose better.

We welcome your questions on any facet of club-style audio engineering. Please send them to:

Sound Advice
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Plainview, NY 11803

Musicians Notebook

Sequential Circuits' Prophet-T8



Unlike guitar or piano, where playing more forcefully alters both the amplitude and timbre of the notes being played, most synthesizers offer little—if any—dynamic response. While at least a few parameters are usually placed under the player's "real-time" control (e.g., pitch via a pitch bend control, or vibrato via an LFO depth control), with few exceptions, the only way to vary overall dynamics is with a volume foot pedal or master volume control.

Being originally trained on guitar, where there is constant dynamic interaction between player and instrument, traditional keyboard synthesizers always felt somewhat "distant" to me. (Of course, Donald Buchla, Robert Moog, and many others have produced a variety of touch-sensitive instruments; as a rule, though, these instruments have not been widely available.) But now there's the T8, an eight-voice polyphonic programmable synthesizer whose keyboard offers smooth, natural, realistic touch response. For starters, you have 76 keys to work with—so you are not restricted to a cramped little keyboard. Second, the keys are made of wood and carefully weighted for a good feel. Third, and most importantly, the T8's keyboard uses optical technology to sense velocity (how hard you strike the keys), pressure (how hard you press down on the keys once a note or chord is held down), and release (how fast you release the keys). It converts this information into control voltages which can influence such parameters as pitch, pulse width, volume, filter cutoff, and the like. I cannot emphasize how great it is to be able to *play* the keyboard; we're not talking about a series of simplistic on-off switches (as found on most synthesizers), but rather, a keyboard that provides a means of physically interacting with many of the most important parameters a synthesizer has to offer.

That's the good news. The bad news is the list price:

\$5,895—well beyond the means of most musicians. And that's a shame, because the T8 has the kind of keyboard action many synthesizer players have longed for since the advent of the synthesizer. (An assignment for the engineers at Sequential: Now that you've figured out how to make a sensuous keyboard, figure out how to make it inexpensively.)

So much for an introduction; let's examine the synthesizer section.

The Synthesizer. Since Sequential has set such a high standard for their keyboard, you can't help but measure the synthesizer against those standards. Basically, the T8 is a Prophet-5 with a few extras. As such, it seems strange to couple a quantum leap in keyboard technology with a considerably more ordinary polyphonic synthesizer, but the T8 does have the virtue of familiarity. Don't misunderstand—the T8 is a very capable synthesizer with extremely good fidelity (this is the most hiss-free synthesizer I have played), but if you're looking for something that extends the boundaries of synthesizer signal-generating technology, look elsewhere.

The T8 includes two oscillators (A and B), each of which can select any combination of sawtooth, triangle, and variable pulse waves. Both include frequency (quantized in half-note steps) and pulse width controls. Osc A also has a sync switch to lock it to Osc B's fundamental. Osc B includes three controls not found on Osc A: a fine tune control for detuning effects (such as chorusing), a keyboard track switch (when on, Osc B follows the keyboard; when off, Osc B remains at the frequency set by the frequency control), and a low frequency select switch. If you turn on the latter switch, Osc B can become another LFO for modulation purposes (described later).

The two oscillator outputs, along with a white noise

output, feed three independent mixer level controls. The mixer output proceeds to a standard lowpass filter section with cutoff, resonance, envelope amount (i.e., how much the filter envelope influences the filter cutoff), and keyboard amount controls. The latter lets you scale the filter to the keyboard, so that, for instance, the higher notes can have a lower cutoff frequency than the lower notes. The filter has an associated ADSR generator.

The filter output then goes to a VCA that also has an ADSR generator. However, there are two options unique to the T8's envelope generators. First is a switch that lets you select an "ADR" response. When on, the envelope bypasses the sustain portion of the cycle, proceeding directly from initial decay to release. Also, there is a programmable "second release" time that is footswitch-selectable. When you press the footswitch, the release time changes to a second, pre-programmed release time. If the second release is set for a longer decay than the first release, pressing down on the footswitch gives an effect similar to a piano's sustain pedal.

There are several modulation options. One is a standard LFO with triangle, sawtooth, and square waveforms. You cannot select more than one waveform at a time. The LFO also includes a wide-range frequency control, switches for selecting any combination of four destinations (Osc A frequency, Osc B frequency, Osc A + B pulse width, and filter cutoff frequency), and an initial amount control which sets the amount of modulation being sent to the above destinations.

Another modulation option is Poly-Mod. This rather esoteric feature adds a great deal of potential to the instrument by letting you use the Osc B output and/or the filter envelope (each has its own amount control) to modulate one of three switch-selectable destinations (Osc A frequency, Osc A pulse width, or filter cutoff frequency). The Osc B amount control is set up like a standard attenuator; when fully modulating Osc A's frequency with Osc B in the audio range, you can get a variety of buzzy, clangy, and fuzzy sounds. But remember, you can also switch Osc B into the sub-audio (LFO) range. When you do, it sounds like Osc A is being modulated by an LFO; but upon closer listening, you'll note that each key you play has a slightly different LFO rate. This is because playing notes not only varies the frequency of Osc A, but of Osc B as well (assuming, of course, that Osc B is tracking the keyboard). This "polyphonic LFO" effect can be very useful.

The amount control for the filter envelope control (which, like Osc B, can be routed to any combination of three different destinations) works in a somewhat different manner from the Osc B output amount control. At center position there is no modulation from the filter. Turning clockwise modulates positively (i.e., as the filter envelope rises and falls, the destination parameter rises and falls), while turning counter-clockwise modulates negatively (i.e., as the filter envelope rises and falls, the destination parameter falls and rises).

There are also two modulation wheels, one for pitch bend and one for modulation. The pitch bend is fixed to a pitch bend interval of about plus-or-minus four semitones. The modulation wheel adds to any LFO

modulation selected with the initial amount control (see above).

The T8 also includes a master tune control, "A" 440 Hz tuning standard tone, tune switch for automatic tuning of the instrument (which must be done periodically, say, every 15 minutes or so), master volume control, programmable volume control (for balancing the level of different patches), cassette interface controls, and a sequencer. The latter features a 670-note capacity (shared by up to eight sequences), rate control, and start/stop switch. While there is no arpeggiator and no provision for an external sequencer clock, the T8 does have a MIDI interface, which presumably lets you tie the synthesizer into drum machines and the like if you have the necessary accessories. (Note to just intonation fans: You can also change the temperament by sending commands through the MIDI port.)

Think we're finished yet? Not by a long shot. How about...

Programming Functions. The T8 stores 128 patches, but with a somewhat unusual protocol. There are two banks ("left" and "right") that store 64 different patches. Two LED displays show the selected patch for each bank. There are also two switches ("left" and "right") that let you select the bank whose patch is to be edited or recalled, and eight additional switches that select the desired bank patch number. Note that each bank can have similar-numbered patches that sound different—for example, patch #36 left and #36 right are two different patches.

With this approach you have several ways to play with the patches, depending on the setting of three "keyboard" and three "mode" switches. The keyboard switches let you choose between *single* (the entire keyboard plays the patch selected with the left or right switch), *split* (the left half of the keyboard plays the left bank patch and the right half of the keyboard plays the right bank patch, with the split-point programmable for each split patch), and *double* (the left and right patches are combined to make a thicker sound). With *single*, you can play eight voices simultaneously. With *split*, each half of the keyboard can play up to four voices. With *double*, you can play four doubled voices simultaneously. Note that *double* lets you double *different* patches—you are not limited to doubling the same patch.

Then there are the mode switches, including a mysterious "link" switch. With the T8, whenever you store a patch in one bank, whatever patch is showing in the LED display for the other bank gets stored along with the first patch. Therefore, if you have some particular combination of sounds you particularly like for a split patch, you can "link" them together so that upon recalling the patch you stored in one bank, the linked patch will appear in the other bank's display.

Another feature of link is that it operates independently for the two banks. For example, suppose you link patch #62 to patch #35, and then store #35 in the left bank. Whenever you recall patch #35 from the programmer, patch #62 will appear in the right bank. However, you can also switch over to the right bank and link a *different* left bank patch to patch #62. In other words, just because #62 right is linked to #35 left doesn't necessarily mean that #35 left is linked to #62

right. You can also store a patch in more than one location to get multiple linked pairs and generally have a good time tying patches together in various combinations.

Yes, I know the above sounds strange and complicated, but after playing with the T8 for a few minutes everything seems to fall into place. In fact, I went from thinking that this way of dealing with patches was cumbersome, to thinking it was okay, to thinking that it's really quite clever and gives you a lot of options you wouldn't otherwise have.

Let's see, what have I left out...? Well, there's a preset switch. When on, you can recall presets, and when off, you're in "manual" mode where the controls act like those of a standard, non-programmable synthesizer. And there's unison/track, which lets you stack all eight oscillators on one note, or stack a chord onto one note... and a record button when you want to store a patch. There's even a portamento (glide) control, although like most polyphonic synthesizers, its action is not all that predictable.

Keyboard Modulation Options. This is what makes the T8 so responsive, and, best of all, these controls are all individually programmable for each patch. There are two velocity-sensing controls—attack/decay and release. These determine how the keyboard reacts to your touch. With attack/decay up, if you hit the keys hard the attack and decay cycles behave accordingly; hitting the keys softly extends the attack and decay times. With release up, the longer it takes you to release your fingers from the keyboard, the longer the release time.

There are also two amount controls, one for the filter and one for the VCA, which determine how the filter cutoff and VCA amplitude parameters react to the keyboard. At center, the filter and VCA are not affected by the keyboard. When turned clockwise, hitting the keys harder raises the filter cutoff and VCA level. When turned counter-clockwise, hitting the keys harder lowers the filter cutoff and VCA level. Having these different options is useful if two patches are set up to respond differently to the keyboard. You can even do such things as change the mix of two patches by changing the velocity with which you hit the keys. (The total dynamic range of the keyboard response is about 30 dB.)

So much for velocity sensing, and, believe me, it's a lot. The pressure sensing part offers an amount control (again set up as above, so that you can increase or decrease a parameter with increased pressure), along with seven destination switches. You can affect any combination of Osc A frequency, Osc B frequency, Osc A + B pulse width, filter cutoff, VCA level, LFO amount, or LFO frequency. Best of all, the pressure sensing is polyphonic. Therefore, if you're holding down a chord and press one key out of that chord, only that one key will be affected by the pressure sensing circuitry. This gives you fantastic control over the keyboard, and the response is totally natural once you have the controls tweaked up for your style of playing.

Details. There are also some minor points, such as the fact that the pitch bend and modulation wheels can be enabled for each patch. Thus, if you have a split or double patch, you can bend the left bank only, the right

bank only, or both banks. The cassette interface has some nice features too, like letting you save/load the entire batch of 128 programs (note, however, that this takes about a minute and a half) or individual groups of eight programs. And let's not forget the jacks on the back, namely separate mono and stereo outputs; footswitch jacks for 2nd release, unison/track, and sequencer start/stop; cassette interface "to tape" and "from tape" jacks, and MIDI in/out jacks. There's also a memory protect switch, power on/off switch, and 110/220V voltage selector switch.

That takes care of the important points, although, of course, much more could be said about the subtleties of this instrument. But the name of the magazine is *Modern Recording & Music*, not *T8 Review*, so without further ado let's proceed to the...

Conclusion: While the synthesizer section of the T8 is certainly more than adequate, and is capable of some fine sounds when properly tweaked, it's the keyboard itself that is the star of this show—and frankly, the keyboard is a masterpiece. Additionally, the action is so natural that you should have no trouble adapting to the velocity and pressure sensitivity. There's nothing awkward about the response, such as dead spots or sudden jumps in sensitivity.

In fact, I can really fault the T8 on only one thing: price. It's somewhat depressing to wait 17 years for a synthesizer with a keyboard like this, only to not be able to afford it when it finally arrives. But that's life, I suppose. And for those with six grand of disposable income, enjoy your T8—it's quite a machine.



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Ambient Sound

The Stereo TV Decision And The Recording Industry

On December 22, 1983, several representatives of the electronics industry got together to vote for a preferred multi-channel TV sound system. Actually, two votes were involved. First, the voters had to choose one of three basic transmission systems that had been tested and under consideration for the better part of five years. Having chosen one of these transmission systems, the participants in the voting procedure then had to choose one of three noise reduction systems, popularly referred to as companding systems. (The term companding is derived from the two-part encoding and decoding process, which involves compressing at the transmission end and expanding at the receiving end of the two-part system.)

The three transmission systems that had been studied were those proposed by the EIAJ (Electronic Industries Association of Japan), Telesonics Corporation, and Zenith Corporation. The EIAJ system proposal was similar, but not identical, to the stereo TV sound system in use for the past five years in Japan. For stereo TV sound, it employs an FM-modulated sub-carrier, whose center-frequency is twice the TV horizontal line rate, or 31,468 Hz. The two remaining transmission systems both employ AM-modulated, suppressed sub-carriers. The Telesonics system proposed a sub-carrier frequency of 2.5 times the horizontal line rate (39,335 Hz), while the Zenith system positioned the AM-modulated suppressed sub-carrier at twice the horizontal line rate. Additional subcarriers, for other uses (such as the broadcasting of a second language or even a totally different audio program) were also included in all three system proposals, but as tests went forward, all three transmission system proponents agreed upon a single standard for these additional subcarriers. The additional sub-carrier designed to be used for second language or other audio programming has come to be known as the Separate Audio Program, or S.A.P. Channel. After years of testing and re-testing, the industry voted for the Zenith system of transmission and for a modified dbx system of companding. This combined system will be submitted to the FCC as the basis for their rule-making; the FCC is expected to move quickly in this matter.

Before we examine the possible impact of this decision on the recording industry, let's take a quick look at the technical details of the chosen system. In the Zenith transmission system, main channel modulation consists of an (L+R) audio signal. An (L-R) stereo difference audio signal causes double-sideband,

suppressed carrier amplitude modulation of a sub-carrier at twice the horizontal line rate frequency. Audio bandwidth of each signal extends to 15 kHz, and the main channel pre-emphasis remains at 75 microseconds, as in the past. Pre-emphasis of the stereo sub-channel is a part of the companding system, which will be described shortly.

The combined peak deviation of the main channel and stereophonic sub-channel is 50 kHz, due to the interleaving property that occurs when L and R are statistically independent. Under this condition, the peak deviation due to the stereophonic sub-channel is also 50 kHz. When L and R signals are not statistically independent, or when (L+R) and (L-R) do not have matched pre-emphasis characteristics, the combined deviation of main channel and stereophonic sub-channel is constrained to 50 kHz and the separate components assume their respective natural levels dictated by the acoustic scene.

A CW (continuous wave) pilot signal, having a frequency of the horizontal line rate, is transmitted with a main carrier deviation of 5.0 kHz. The sub-carrier for the Second Program Channel is five times the horizontal line rate (or 78.67 kHz) and is frequency locked to that frequency in the absence of modulation. The S.A.P. channel is FM-modulated to a peak deviation of 10 kHz by a signal that is band-limited to 10 kHz, and its pre-emphasis is, again, part of the chosen companding system. Main carrier deviation by this sub-carrier is 15 kHz.

A third sub-carrier, known as the Professional Subchannel (which intended for voice or data transmission), is located at approximately 6.5 times the horizontal line rate. This last sub-carrier causes 3 kHz deviation of the main carrier.

How The dbx Companding System Works

Although the companding system chosen by the industry for noise reduction bears the name dbx, and was proposed by dbx, Inc., its operation is more sophisticated than that of the familiar dbx noise reduction system found in consumer tape recorder products. The compander works in two stages. First, it provides wide-band amplitude compansion to reduce dynamic range in the transmission channel at all audio frequencies. This section utilizes a 1:2:1 linear dB compander, similar to dbx's approach to noise reduction, for tape recording. In addition, the compander provides variable pre-emphasis de-emphasis, which adapts itself to the spectral

distribution of the program material to take full advantage of the limited channel headroom available. The spectral compressor is able to boost or reduce high frequency levels, depending upon the input signal spectrum.

RMS detectors are used to control both the amplitude and spectral companders, thereby providing minimum sensitivity to impulse noise while maintaining appropriate reaction times for music signals. A clipper is provided within the compressor control loop for preventing channel overload without inducing compressor/expander tracking errors. Band-limiting filters are also included in the compressor design. Compensation for the phase errors caused by band-limiting throughout the system is provided in the form of a complementary sum (L+R) channel filter.

What has all this to do with recording? (We were beginning to wonder—Ed.) Quite a bit, as I will now explain. Ever since 1958 or so, the recording industry has been learning how to mix sounds and position microphones for what was regarded as good stereophonic imaging. With no visual clues to guide the listener, we attempted to create a sort of “sound stage” that aurally positioned instruments and vocalists across an imaginary stage, extending from well to the left of the listener to his or her extreme right. During the early years of stereo recording, the results of those efforts very often sounded like two separate and distinct musical aggregations—one playing near the left loudspeaker, the other positioned just behind the right speaker. In time, we learned how to “pan” and thereby how to create a smooth spread of instruments picked up by the many microphones typically used in a multi-channel recording. The best efforts along these lines have resulted in recordings that provide very much the same spatial illusion one would get at a live performance. Poorer efforts have been described as “multi-channel mono” rather than effective stereo, but all of these recordings have emphasized fairly wide separation. It has even been fairly common practice in recordings using vocals to offset the vocalist from dead-center simply to lend interest and variety to a performance.

Now let's consider what the situation is going to be when stereo TV hits the airwaves. Suddenly, the viewer/listener is going to be confronted by a small screen and a wide sound field. Let's face it, even those listeners who own projection TV systems (and they are relatively few in number) will still have a much wider sound field relative to their picture width than would be true in a motion picture theater. Many psycho-acousticians have questioned the value of having such a widely spread sound image associated with a small “dead-ahead” video presentation. In the case of strictly musical presentations, most of us have had some experience with “stereo TV” already, thanks to the many years of simulcasts, largely produced and supported by Public Television. In such simulcasts, the public apparently has *not* objected to seeing video closeups of a single instrumentalist followed by long shots of the entire orchestra followed, in turn, by views of the conductor waving his baton, with the sound field remaining fixed (and nicely spread out between the loudspeakers) during all these scene changes. But what will happen when stereo is used for video drama, or sporting events, or comedy/variety

shows or—perhaps most important of all—made-for-TV motion pictures whose sound tracks will now have to take stereo into consideration?

In such cases, recording engineers can profit by the experience gained in Japan and Germany, where stereo TV has been a reality for several years. In drama, for example, dialogue between characters has been kept tightly “locked” on center-channel, so that the spoken words continue to emanate from the actors' lips, on screen, rather than drift around as the actors move around the stage set. This has been true even when long shots offered a view of an entire room or an expanse of space. That being the case, what benefits can stereo TV offer in terms of program enhancement? For dramatic programs or other programs involving people speaking on-camera, stereo has been used in Japan for background music, sound effects, and the like. In other words, it has been put to good use in much the same way that Stereo motion pictures have used stereo sound—to enhance the drama without creating unreal sound fields in relation to what the actors are doing on screen.

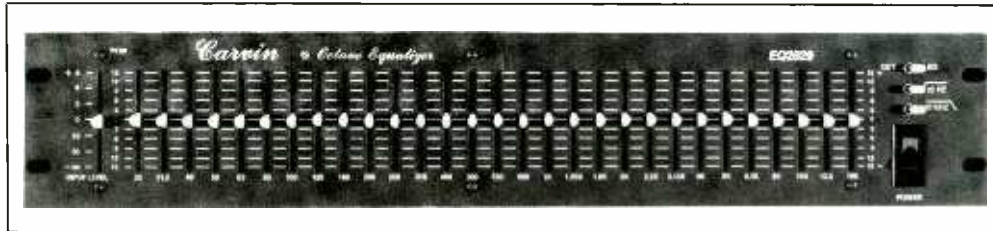
Some years ago, I was in Japan during the time when Sumo championship wrestling matches were being held. Of course, these were covered on TV—and in stereo at that! In the case of this widely followed sporting event, the announcer's voice and even the “grunts” of the contenders were confined to “stage center,” and therefore seemed to emanate from the TV screen. Stereo was used to advantage by allowing the crowd noises and applause to come from everywhere. The overall effect was very exciting in that the viewer became part of the excited crowd—in fact, surrounded by it.

Several audio experts have suggested that what we really should be doing with stereo TV is to employ a three-channel arrangement rather than a two-channel setup. In such an arrangement, the TV set would still be equipped with its own internal speaker system. This speaker would be fed with a mono mix (L+R), while the separate L and R signals would be fed to flanking speakers or to the widely separated speakers of an associated stereo system in the viewing room. A strong proponent of such an arrangement has been Mr. Emil Torick of CBS Technology Center, who has demonstrated such a three channel system to me. With the availability of a separate audio program channel in the selected stereo TV system, it might even be possible to transmit dialogue or other center-channel material on the S.A.P. channel while “pure” stereo material could be broadcast via the regular main channel and sub-channel components of the transmitted signal. Compatibility for owners of older TV sets need not be sacrificed, since the L+R signal would also be received by such sets.

Clearly, the recording engineers of the world are going to have to re-think their recording techniques as we enter the world of stereo TV in earnest. Since TV has a voracious appetite for more and more material, I suspect that, in the next few years, recording studios are going to be mighty busy turning out new sound tracks and perhaps remixing old ones to suit the needs of this latest—but different—stereo medium. Fortunately, the transition to stereo will not take place all at once, so those of us involved in audio recording will have sufficient time in which to learn these new approaches to sound recording.

Lab Report

Carvin EQ2029 1/3-Octave Graphic Equalizer



General Description: The EQ2029 is a professional 1/3-octave graphic equalizer suitable for use in remote broadcasts, recording, or sound reinforcement. It is a single-channel equalizer, and therefore two units would be required to equalize a pair of stereo channels or for a high-fidelity stereo system. Despite its obvious professional construction and design, Carvin Corporation stresses the fact that the unit would do well in a home hi-fi application or in an advanced home recording setup. Indeed, our measurements of the performance of this unit clearly illustrated why equal emphasis was given to pro as well as domestic use of the equalizer. It had the lowest distortion and the most extended frequency response of any graphic equalizer we can remember testing in recent years.

Physically, the chassis and panel design of the EQ2029 are intended for standard 19-inch rack mounting. The twenty-nine slider controls which control the 1/3-octave bandpass filters of the equalizer are all equipped with center-position detents, making it simple to reestablish flat overall response when starting to equalize a system in a new environment. Only active-bandpass filters are used in the circuitry; there are no inductors or gyrators used.

Controls and Switches: In addition to the 29 frequency slider controls already mentioned, the EQ2029 is equipped with a slider-type gain control which is located at the extreme left of the panel. The gain control is calibrated from "minus infinity" (input turned completely off) to +6 dB, with the "0 dB" (unity gain) point occurring dead center on the slider, parallel to the "flat response" settings of the individual third-octave slider controls. Thus, when all the white-tipped slider controls are set to their mid-points, response is flat and gain is 0 dB.

At the extreme right end of the panel are four switches. The first of these is an EQ bypass switch, handy for making instant A/B comparisons between equalized and unequalized system sound. Just below

that switch are low- and high-cut filters. The low-cut filter has a nominal -3 dB point set at 20 Hz, while the high-cut filter's cut-off point is set at 20 kHz. With the high-cut filter activated, roll-off above 20 kHz is at a rate of 18 dB per octave. The power On/off switch, located at the lower right hand corner of the panel, illuminates when power is turned on.

The input connectors to the EQ2029 are located at the far right of the rear panel. There are four input connectors in all: a female 3-pin XLR connector, a male 3-pin XLR connector, and two 1/4-inch phone jacks. The XLR connectors are wired in parallel, as are the two phone jacks to facilitate distribution of the input signal to other equipment. The XLR connectors will accept either balanced or unbalanced input signals, since the EQ2029 employs an active differential input stage. The 1/4-inch phone jacks accept only unbalanced input signals.

The output connectors are located just to the left of the input connectors and consist of a single male 3-pin XLR connector and a 1/4-inch phone jack. The XLR output connector provides an active-balanced output signal, while the phone jack offers an unbalanced signal. Output signals have the same polarity as input signals.

Test Results: A summary of our measured test results is compared with Carvin Corporation's published specifications in our usual table of VITAL STATISTICS. *Figure 1* is a plot of frequency response, made using our Sound Technology Model 1500A audio tester. The sweep extends from 20 Hz (at the left) to 40 kHz (double vertical lines denote 100 Hz, 1 kHz and 10 kHz points), and the vertical scale is 10 dB per division. Two sweeps were made: one with the high and low cut filters "off," the other with these filters turned "on." The cursor has been set to indicate the response, in each case, at 20 kHz. Response was -0.4 dB at that frequency (well within the ± 1 dB tolerance claimed by the manufacturer), while with the high-cut filter

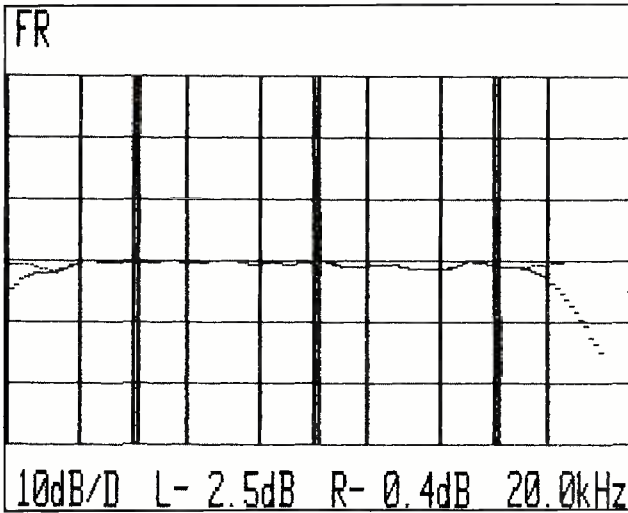


Figure 1. Frequency response for the Carvin EQ2029 equalizer with and without low- and high-cut filters activated.

activated, response was down -2.5 dB at 20 kHz, close enough to the -3 dB cut-off point. Separate measurement of the frequency response of the equalizer, using instrumentation that extends beyond the end points of our automatic sweep system, led us to the fact that the -3 dB points for the equalizer (with no high or low cut filters activated) occurred at frequencies of 4 Hz and 82 kHz.

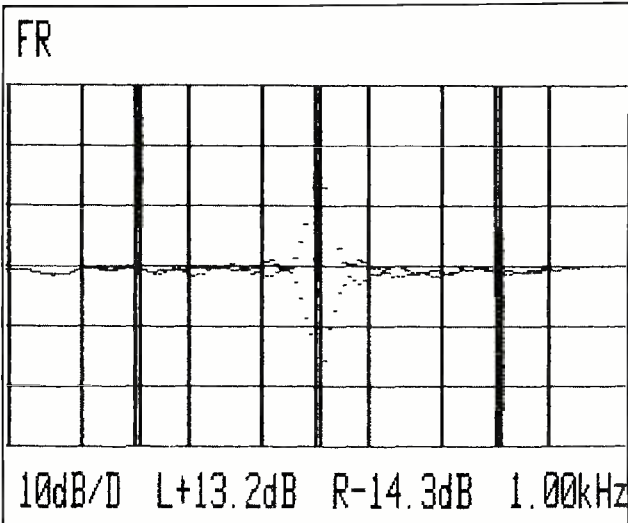


Figure 2. Multiple sweeps show boost and cut range of each bandpass filter of the EQ2029.

Figure 2 shows a 'scope photo taken of the face of our audio spectrum analyzer/storage scope, on which we had plotted successive sweeps showing the boost and cut range of each of the 29 third-octave controls of this equalizer. A detailed plot of the boost and cut range and bandwidth of a single filter (1 kHz) is shown in Figure 3. Maximum boost for this particular filter was +13.2 dB, while maximum cut was -14.3 dB. Figure 4 shows the response obtained (over the range from 20

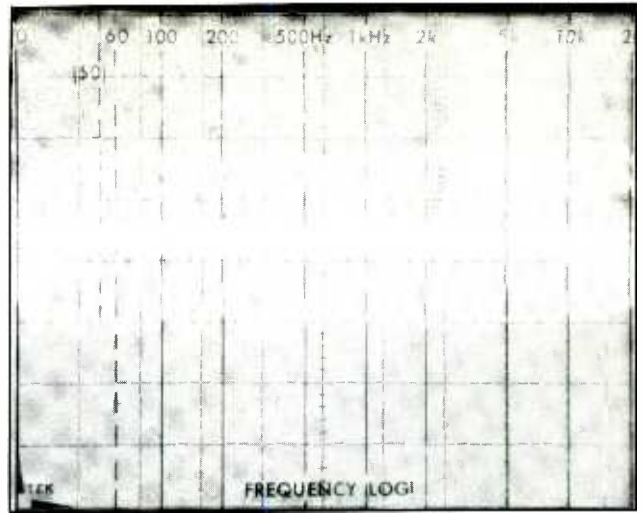


Figure 3. Detailed plot of boost and cut characteristics of a single filter (center frequency: 1 kHz) of the EQ2029.

Hz to 20 kHz, log sweep) with all filter controls set to their mid-points (middle plot), with all filter controls set for maximum attenuation (lower plot), and with all controls set for maximum boost (upper plot).

Harmonic distortion measured for this equalizer was lower than we have ever measured for a similar product. At mid-frequencies (at an input level of +10 dB), THD measured only 0.004 percent, increasing

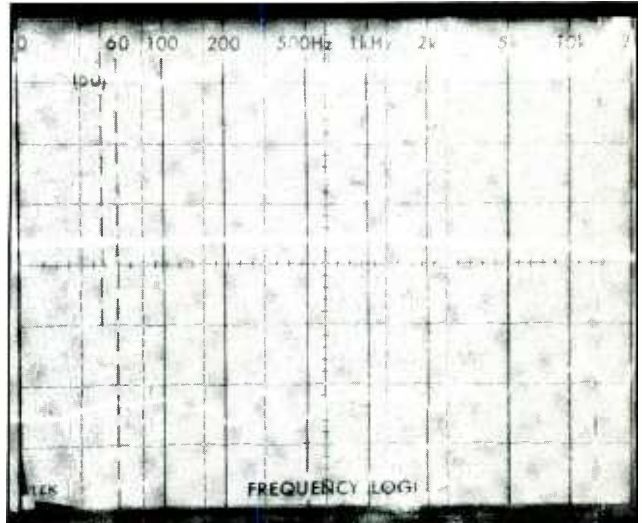


Figure 4. Overall response of the EQ2029 with all filter controls set to maximum (top curve), mid-points (center curve) and minimum (lower curve).

minimally to 0.005 percent at 20 Hz and to 0.0075 percent at 20 kHz. What's more, the distortion remained almost as low as input levels were increased until just before actual overload occurred (at around +20 dBV). IM distortion was equally impressively low, with readings of 0.009 percent at +10 dB input.

Figure 5 is a 1/3-octave plot of signal-to-noise for this equalizer. The plot was made using a reference level of 0 dBm (0.775 volts across 600 ohms). Overall S/N,

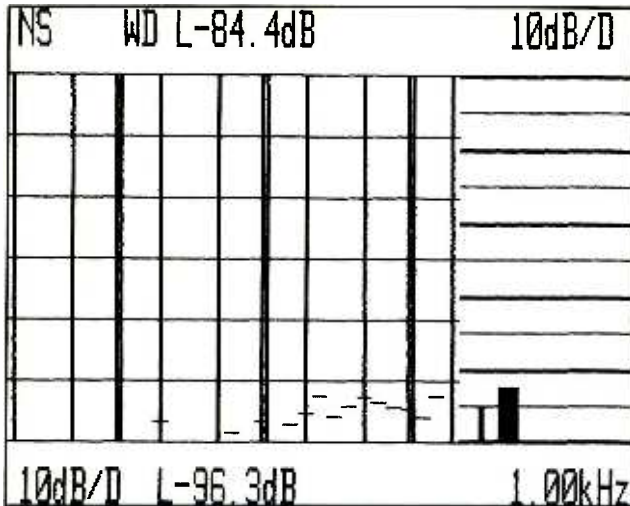


Figure 5. Signal-to-noise ratio analysis of the EQ2029 (referenced to 0 dBm output).

shown at the top of the plot, was -84.4 dB. If the 20 dB of headroom is added to this figure, we come up with an overall S/N ratio of 104.4 dB, an excellent figure and one that corresponds almost exactly to the manufacturer's claims.

Comments: We found the Carvin EQ2029 to be everything its manufacturers claim for it. It fits into the audio signal path at almost any convenient point

where there is a nominal "line level" signal. In recording studio applications, an appropriate point at which to insert the equalizer in the listening chain is between the mixer's control room outputs and the inputs to the power amps. Of course, two EQ2029s would be required for stereo operation or monitoring.

In most applications, we found that the high- and low-cut filters did not color or alter overall sound quality at all, and therefore left them on since they do afford protection from sub-sonic transients (which might damage woofers) and from ultrasonic oscillations in system components ahead of the equalizer, which might damage high frequency horns or tweeters. Only the super-hi-fi purist would object to such filtering outside the actual audio spectrum, and such purists, of course, have the option of turning the filters off at any time, for "critical" listening requirements.

The owner's manual supplied with the EQ2029 goes into some detail regarding the use of a pink noise generator and an audio spectrum analyzer in attempting to use any equalizer. The manual points out that while a loudspeaker's "worst" problems can be corrected—to some degree—by ear, only such instrumentation, properly used, can provide precise correction no matter how good the equalizer is. We couldn't agree more. In fact, it is the very high quality of the Carvin EQ2029 that demands suitable related equipment if the full benefits of this equalizer are to be obtained. The makers of this product have proven, once again, that high fidelity performance and professional audio requirements can be found in the same piece of equipment.

CARVIN EQ2029 1/3-GRAPHIC EQUALIZER: Vital Statistics

SPECIFICATION	MANUFACTURER'S CLAIM	LAB MEASUREMENT
Input Impedance	20K ohm, balanced 10K ohm, unbalanced	Confirmed Confirmed
Maximum Input Level	+20 dBv	+21.3 dBv
Output Impedance	150 ohms, unbalanced 300 ohms, balanced	Confirmed
Maximum Output Level	+20 dBv into 600 ohms, unbalanced; +26 dBv into 1200 ohms, balanced	+21.0 dBv +26.5 dBv
Boost/Cut	±15 dB	±13.5 dB (typ.)
Frequency Response	20 Hz-20kHz, +1 dB	Confirmed
-3 dB Bandwidth	7 Hz to 85 kHz	4 Hz to 82 kHz
THD	Below .01%, 20Hz-20kHz	0.004% at 1 kHz 0.005% at 20 Hz 0.0075% at 20 kHz
IMD	N/A	0.009%
Noise	104 dB below max. output	104.4 dB (84.4 dB below 0 dB reference level)
Power Requirements	120/240 VAC, 560/60 Hz	Confirmed
Dimensions (W x H x D) inches	19 x 3½ x 7	Confirmed
Weight	8¾ lbs.	Confirmed
Price: \$279.00		

Circle 50 on Reader Service Card



The Market Place

what's new in sound and music

ORBAN COMPRESSOR/ LIMITERS

Orban Associates new Model 412A (mono) and 414A (dual channel/stereo) Compressor/Limiters are streamlined versions of Orban's popular 422A/424A Gated Compressor/Limiter/De-Esser. The new units feature user-adjustable Compression Ratio, Attack Time, Release Time, and Threshold controls in addition to Input and Output attenuators. Peak-limiting and compressor functions are cross-coupled to eliminate potential pumping and modulation effects. The Threshold control with 20 dB range allows the user to determine the level at which gain reduction first occurs, without changing below-threshold gain or compromising headroom or signal-to-noise ratio. The new units use exclusive Orban feedback control



circuitry adapted from the Orban Optimod®-FM Model 8100A broadcast processor. The result is a straightforward level control device that provides 25 dB gain reduction range with minimal audible side effects; however, control range is adequate to produce desired special effects in production. An illuminated, peak-reading Gain Reduction meter provides metering of total gain reduction. Two LEDs indicate program ampli-

fier clipping and overload of the control circuitry. Suggested retail price of the 412A (mono) is \$425.00; it mounts in a single rack space. Suggested retail price of the 414A (dual channel/stereo) is \$799.00; it mounts in a double rack space. Active-balanced, floating inputs and outputs are standard on both units.

Circle 51 on Reader Service Card

ELECTRO-VOICE CARDIOID CONDENSER MIC

Electro-Voice's model BK-1 microphone has recently been added to its product line. The new microphone departs from EV tradition in a number of respects, including its unique physical profile and handsome black design, while combining popular features from other mics in the EV product line. Dubbed the "Black Knight" by EV, the BK-1 is a cardioid condenser mic especially suited to the needs of vocalists, though it is also excellent for other applications. The Black Knight's notable mix of features offers the performer usable bass-boosting

proximity effect that tailors low frequency response with changes in the working distance. The mic's high sensitivity, smooth, peak-free frequency response, and cardioid pickup pattern assure excellent rejection of unwanted off-axis and reflected sounds that cause feedback in a live entertainment situation. This electret condenser-type mic can be powered by either a battery or phantom power. The mic is fitted with an On/Off switch to greatly prolong battery life.

Circle 52 on Reader Service Card



ROLAND DIGITAL KEYBOARD RECORDER

Roland's new MSQ-700 Digital Keyboard Recorder is a 16-voice polyphonic sequencer with powerful memory capabilities and many user-friendly features. Built-in computer hardware and software make the MSQ-700 fully compatible with any MIDI-equipped instrument. The MSQ-700 has an extensive memory capacity of 6,500 notes, spread out over eight fully polyphonic tracks. It is designed to automatically make the most efficient use of its memory facilities. Rather than assign a set amount of memory to each track, Roland has made it so that each track uses only the amount of memory it needs, leaving the rest free for the remaining tracks. (Not a note of memory is wasted.) At any point during programming, the user can check how much memory he has used up and how much he has left by means of an LED display. Roland has given the MSQ-700 a battery backup system that allows long-term storage

of data. Data can also be stored on cassette via the sequencer's Tape Interface. Loading programs on the MSQ-700 is easy. They can be entered in real time or by using the Step Load function. Whichever method is chosen for data input, the Step Load function comes in especially handy for editing programs. LED displays facilitate easy location of the passage to be edited. Pitch, time value, and duration of each note are readily modified. The playback facilities are also highly flexible. Tracks can be played back serially in any order desired, or multiple tracks can be played back simultaneously. It is even possible to copy several tracks onto one track for greater ease in playback and increased programming potential. Thanks to the MSQ-700's DIN/Sync facilities, it can also be used with drum machines, such as the Roland TR-808 and TR-606. There is also a Tape Sync function, which generates its own synchronized code for use



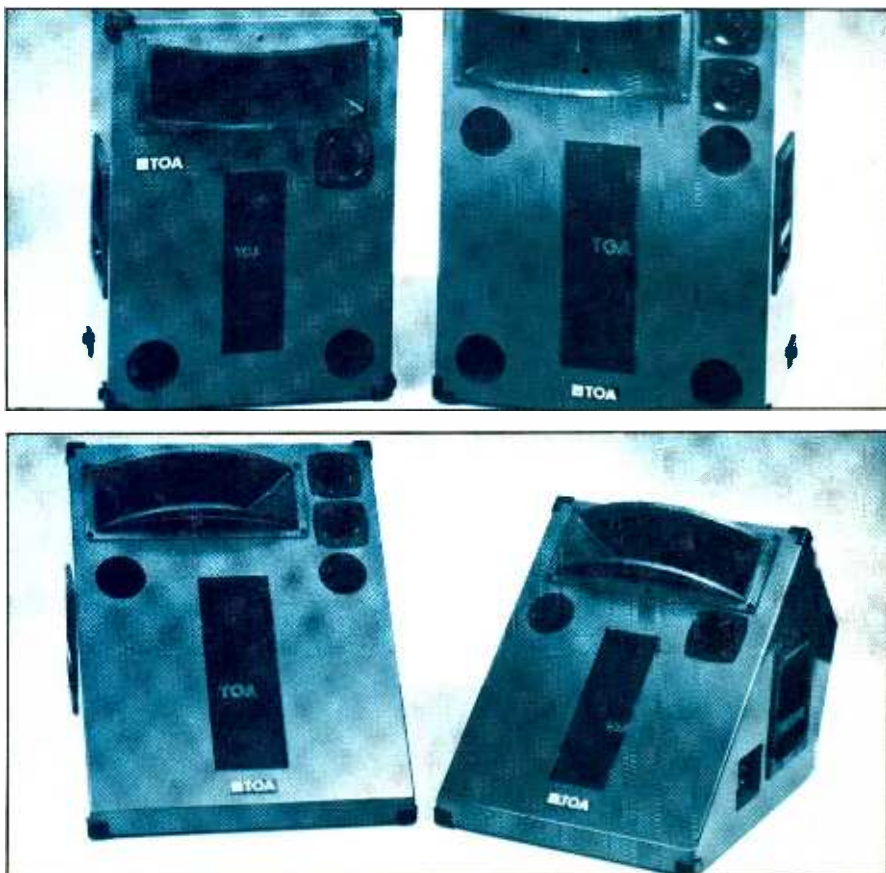
during multi-track recording. It allows numerous instruments to be recorded onto a single track of tape, without the generation loss associated with ping-ponging tracks. The Roland MSQ-700 measures 14/56-in. wide by 13.12-in. deep by 4.32-in. high, and weighs 11 lbs. It carries a suggested retail price of \$1,195.00.

Circle 53 on Reader Service Card

TOA SPEAKER SYSTEMS

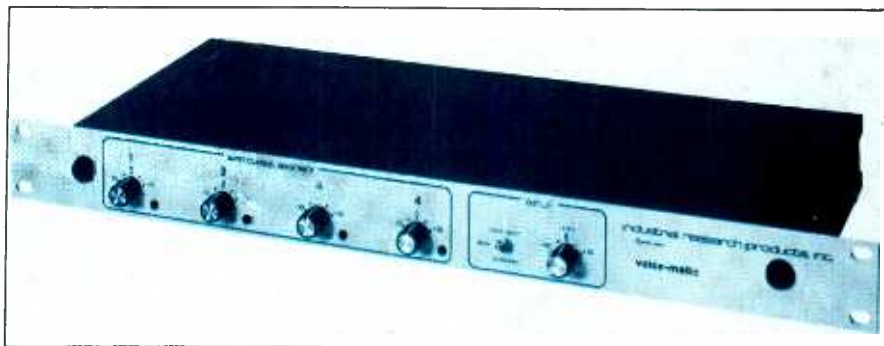
TOA's new SD Series consists of four professional speaker systems for high-quality, live performance applications or permanent installations. The three-way SD Speaker System incorporates a moving-coil tweeter. The speaker features a high-frequency attenuator for tailoring its output to performance requirements and room acoustics. Other features include bi-amp and bridging connectors, recessed handles, interlocking corners, a stand-mounting adapter, and a compact, extra-rugged enclosure. The SD design ensures ultra-low distortion throughout the tonal spectrum over a wide range of sound pressure levels. The system incorporates a Thiele-Small aligned bass reflex design to provide a greater bass range, greater efficiency, and use of its front panel slotting functions as an acoustic low-pass filter. Overall, the SD Speaker is designed to provide extended frequency response (50 Hz to 20 kHz, model 38SD), high power capacity (360 watts continuous program), and a sensitive efficiency rating.

Circle 54 on Reader Service Card



INDUSTRIAL RESEARCH MICROPHONE MIXER

The Industrial Research Voice-Matic Microphone Mixer Model DE-4016 is an automatic four-channel microphone mixer with a Remote Control feature. The electronic circuitry that provides the remote control capability is contained within the chassis of the mixer. The Remote Control function is provided by the DE-207 control box, which passes only dc voltage signals. Channel sensitivity, master level, and Standard/Automatic mode are passed to the DE-207 when it's connected to the DE-4016 chassis, and are returned to the DE-4016 when the DE-207 is disconnected. The DE-4016 has identical performance specifications



to its four-channel predecessor, the DE-4014, and to its modularly constructed 12-channel predecessor, the DE-4013. The potential principle of Dynamic Threshold Sensing allows

this automatic microphone mixer to provide the gain, stability, and low background noise and reverberation pickup of a single microphone system.

Circle 55 on Reader Service Card

NEW FENDER MIXERS

Fender's all new line of powered portable mixers offers configurations from six to sixteen inputs and dual channel, built-in 200-watt-plus power amplifiers. Features common to the line include high-impedance and active, balanced low-impedance inputs, three-band five-frequency equalizers, built-in phantom position, and LEDs that show signal present and/or peak on each input. The four models include two 200-watt power amps, two independent monitor mixes, four patchable graphic equalizers, plus built-in program limiters and effects patching on each input (except model 3206). Models and suggested retail prices are:

- 3206 (6-input stereo, 200 watts-per-channel): \$1195.00;
- 3208 (8-input stereo, 200 watts-per-channel): \$1495.00;
- 3212 (12-input stereo, 200 watts-per-channel): \$1795.00;
- 3216 (16-input stereo, 200 watts-per-channel): \$2095.00.

Circle 56 on Reader Service Card

NEW LINE OF DEAN MARKLEY SPEAKERS

Dean Markley Electronics' "Magnum Power" speakers are now available exclusively in the Dean Markley Signature Series amplifiers. Utilizing high-temperature epoxies, heavy-gauge steel baskets and integral dust covers, the speakers incorporate magnets ranging from 20 to 100 ounces. Three models are available in



12-inch sizes, including 40-, 80-, and 125-watt capacities. A 10-inch, 50-watt model is also offered, the same speaker used in the popular 410 cabinet in the series.

Circle 57 on Reader Service Card



1/4 Notes

MAKING TRACKS

Jimmy Miller, producer of the **Rolling Stones**, **Spencer Davis Group**, **Blind Faith** and **Traffic**, is back in NY to produce a new band called **Face The World**... New from **Fantasy**, **Milestone** and **Prestige**: saxophonist **Steve Douglas** with his second album for Fantasy Records. Guest artists include **Duane Eddy** and **Ry Cooder**. **Sonny Rollins** is due to release his new Milestone album this spring... Recently at **SoundShop Recording Studios**: **Lee Greenwood** recording for **MCA Records** with producer **Jerry Crutchfield** and engineer **Ernie Winfrey**. **CBS** artist **Tammy Wynette** also recording with producer Jerry Crutchfield and engineer Ernie Winfrey... Long Island based rock group **Industry** has completed their debut LP for **Capitol Records** at **Boogie Hotel Studios**. **Vinnie Poncia** produced with **Bob Schaper** engineering... **Columbia** recording artist **Johnny Mathis** is moving in a new direction with his recent LP *A Special Part of Me*. Produced by **Denny Diante** and arranged by **Michel Colombier**, this album features duets with **Deniece Williams** and **Angela Bofill**, and has one cut co-written by **Paul Anka** and **Michael Jackson**... At **Trod Nossel Recording Studios**, **Tommy Dorsey Blues Band** cut basic tracks and completed some mixing for a new LP... **Pumpkin and The Fresh MC's** were at **Quadrasonic Sound Systems** in NY recording a 12 inch for **Profile Records**. The single was produced by **Kurtis Blow** and engineered by **Dave Ogrin**... *Talk Show* is the new album by the **Go-Go's** for **I.R.S. Records**. The 10 song album was recorded and produced by **Martin Rushent** at **Genetic Sound** outside London... **Rick Springfield** has released *Hard to Hold*, the soundtrack from the movie by the same title. Springfield was joined on the album by **Peter Gabriel**, **Graham Parker**, **Nona Hendryx** and **Randy Crawford**... At **Sound Emporium Studios**: Country artist **Gene Watson** along with co-producer **Russ Reeder** began work on a new album for MCA Records. **Jim Williamson** engineered with **Cathy Potts** assisting. **Don Williams** was also in working on a new album for MCA. He is co-producing the album with **Garth Fundis**. **Gary Laney** engineered... **Randy Kling** of **Disc Mastering Inc.** recently mastered **Charly McClain** and **Mickey Gilley's** forthcoming **Epic** duet album, *It Takes Believers*. The album was produced by **Norro Wilson**... **Bee Gee Robin Gibb** was at **Criteria Recording Studios** working on his second solo album. The album is being co-produced by Robin and his brother **Maurice**. **Dennis Hetzendorfer** engineered with **Richard Achor** assisting... **Percy Jones**, former leader of **Brand X** has formed a new band, **Stone Tiger**. **Bill Frisell** (guitar) and **Dougie Bowne** (drums), make up the rest of Stone Tiger. The group is preparing to record their first LP...

ON THE ROAD

Eurythmics have begun a North American tour that will run through May 1984. Opening for Eurythmics is Australian recording group **Real Life**... **Rocklympics, Inc.** announced that San Diego and Santa Ana Stadiums have reserved dates for the purpose of co-hosting the 1984 **Rocklympics Music Festival** this August 6-10. The festival will feature 20 top acts and will coincide with the summer Olympic Games. Television coverage of the event is being planned... **The Romantics** are presently touring with **Adam Ant**. The tour will continue through the end of April, after which the Romantics will headline their own tour of the West and Southwest... **Westwood One's** mobile studio recently recorded **Genesis** in concert at the Forum near L.A. The concert will be broadcast on Westwood One's Superstar Concert Series... **Sly Dunbar** and **Robbie Shakespeare** celebrated their 10th anniversary as a duo on March third with a five hour show at the Arena in Kingston, Jamaica. The event which was filmed, featured such performers as **Gregory Isaacs**, **Black Uhuru**, and **Sugar Minott**. Sly and Robbie will be backing Black Uhuru on their upcoming world tour... The Go-Go's will begin an extensive North American tour the last week of April. The tour will start out in Florida and will continue throughout the U.S. until the Fall... On the video scene: **The Storytellers, Inc.** has produced a four minute animated rock video featuring **Alan Parsons Projects'** latest release, "Don't Answer Me." The video has already premiered on **MTV**, but will be seen in many other outlets, including movie theaters... **Jazztime '84**, an all star jazz music event, was presented and videotaped at the **Beacon Theatre**, Saturday March 17. The intention of Jazztime was to create a jazz event especially for video...

& MUSIC...



POPULAR

THOMPSON TWINS: *Into The Gap.*

[Produced by Alex Sadkin with Tom Bailey; recorded at Compass Point Studios, Nassau by Phil Thornalley.]
Arista AL8-8200.

Performance: **Another success**

Recording: **State of the art**

The Thompson Twins have never had a love affair with the more traditional rock staples in modern pop (i.e., the electric guitar, bass and lavish drum sets). The trio is more concerned with the rhythm in rock'n'roll, opting to stay with synthesizers and percussion (not drums, but congas, marimbas, xylophones, etc.) as the main instruments in their music. Tom Bailey, Alannah Currie and Joe Leeway are a modern band and, as the tiresome cliché goes, a band of—and for—the eighties.

But that is the only platitude that can be written about the Thompson Twins. Their music is never trite, but bold, flavorful and daring—a celebration. They are constantly looking to find new ways to play their instruments, searching for new sounds and, with each passing album, achieve a mastery and cleverness which surpasses the previous effort.

The single, "In The Name of Love," from the album of the same name, brought popularity to the Twins in 1982. It's lively and festive beat was a smash on the dance floor. Then came "Side Kicks" a year later and the single "Lies," which again proved that the Twins knew how to make people dance. On that record the band did a most curious and danger-



ous thing: they divorced the traditional instruments and only used electronic devices like the synthesizer and drum machine. This intrepid attitude paid off with another success for the band.

On "Into The Gap," the group reenlists a few castaways—the guitar, harmonica, etc.—and uses them as irresistible compliments in their music. Another twist is that the Twins have designed this album for the ear and not for the feet. Gone are the celebrated numbers urging the feet to boogie. Instead, the Twins pay

more attention to how the instruments sound and what they can do. They also look to fuse together all their influences in music, and they do have many. Leeway is half-Irish, half-Nigerian—that's what he told me anyway—while Bailey has always been interested in the Eastern cultures and religions; Currie is a lass from Britain. So what we have here is a meeting between East and West.

This fusion is evident on "The Gap." Here, the synthesizer is programmed like a flute, twirling out a melody

reminiscent of the days of Ali Baba and his 40 thieves. On the other side of the map, "You Take Me Up" is the prime example of a reggae influence. The way Currie plays the xylophone makes it sound like a steel drum, while Bailey's brief harmonica interludes give the song a rough edge.

When the group uses the traditional instruments, they are used sparingly and magically. On "Who Can Stop the Rain," Bailey's electric guitar meanders sweetly between drops of synthesizer. During the introduction of "Day After Day," a trashy, garage-rockin' guitar sets the pace and holds the rhythm of the song.

It seems the Thompson Twins thrive on the thick, juicy, rubbery base sound they have used in the past on "Bouncing" and "Love On Your Side." The bass line just bounces along on "Hold Me Now," as the marimbas and congas add an extra dimension of aural pleasure. "Sister of Mercy," a piece about a bored housewife who stabs her husband to death, has that same heavy, rubbery bass, but this time paired with an xylophone.

Because of the care the Twins put into the percussion and rhythm of their songs, the pieces easily sway you whether fast or slow (i.e., "Doctor, Doctor"). Their flair for adventure and experimentation makes each new album that much more special. Like Joe Jackson, who has featured a different musical approach on each of his records, the Twins approach each effort differently. Whether its musically or mechanically, the Thompson Twins always seem to fill the gap splendidly.

martin basch

THE JIM CARROLL BAND: *I Write Your Name*. [Produced by Earl McGrath; engineered by Gene Paul and Dan Nash; recorded at Atlantic Studios, New York, New York.] Atlantic 7 80123-1.

Performance: **Uneven, but raw and rousing**

Recording: **Nothing to write home about**

You must understand one thing about Jim Carroll: He's a writer. Above his singing and songs, Carroll's forte stands in poetry. It is prose that

is filled with images, shock and drama, parallel to his experiences growing up.

The tall, red-haired Carroll was raised on the streets of New York. He's an Irish-Catholic who played schoolyard hoops with the likes of Kareem Abdul Jabbar and Nate (Tiny) Archibald, became a heroin addict by the time he was 14, and wrote about it in "Basketball Diaries," a book heralded by novelist Jack Kerouac. The singer has also authored a collection of poetry called "Life At The Movies." Clearly, these are not the achievements of your average rocker.

Somewhere along the line he got the idea to try his talents at rock'n'roll. In 1980 he debuted with "Catholic Boy," a stark assortment of songs ringing with anger and rage, featuring the poignant "People Who Died." Whereas his ability as a singer was questionable, his hard-edged tales of sex, death and drugs were mesmerizing. Two years later he released "Dry Dreams," which showed Carroll in a state of dreaminess and bewilderment. A mediocre followup, it was no where near as powerful as the debut.

With "I Write Your Name," Carroll confirms two things: 1) he can't sing, but 2) his songwriting is as provocative as ever. His style of singing is more of a half sing/half chant street rap. He's not as fast as the rappers, nor does he want to be, but he twists and squeezes his voice for a harsh, poetic aural effect. He vocalizes like he not only wants you to hear the words, but taste them, see them and become a part of them. But for the most part, he comes across as a raspy crooner. This is most evident on the album's only ballad (highly uncharacteristic of Carroll), "Dance the Night Away." Here he sounds like a frog with a cold, yet the background harmonies of his hired help guide him through.

Carroll is more of an unpolished, loose, backstreet rocker. His music is simplistic, straightforward and pierced with a high energy level. Sometimes in the production the instruments wash right over his vocals, like in "Voices," which gives the piece a lackluster tone. It could be that his voice is just not strong enough to carry itself.

The album starts out with a couple of punchless tunes in "Love Crimes" and "(No More) Luxuries" but the longer the record spins, the better it

gets. Often a staple in his live performances, Carroll has finally recorded Lou Reed's "Sweet Jane." (Reed is a Manhattanite with a tragic past that Carroll can identify with.) Carroll's version lacks the guts of the original but does have a streetwise feel to it.

Over on side 2, Carroll gives us more insight into his talent with a few fastfire numbers. "Freddy's Store" is crowded with images of streetlife so picturesque that one feels as though he/she is in the store. Lenny Kaye and Paul Sanchez lay down a syndicate of guitar that only adds and widens the dimension of the song. "Black Romance" tells the story of a discreet romance in a hotel as the bass line and drums provide a steady, crawling beat. Carroll uses a bit of a Jerry Lewis-staccato keyboard sound on "I Write Your Name" to make it swing. There is a slight heavy metal flavor to "Low Rider," a top heavy creep-along number with powerful crunching chords and tingling guitar solos.

Carroll's third album does prove that he can handle rock'n'roll as another means of expression. He doesn't stick to cliched song objects in his pieces, and that is what distinguishes him from the mundane. His voice is memorable only because it is unusual and rough. But he is able to convey a sense of excitement in his music which, while it might not make him a star, will give him a following that will look forward to each album. And, with each record, more stories of passion and pain.

martin basch

CHRISTINE McVIE: *Christine McVie*. [Produced by Russ Titelman; engineered by David Richards; mixed by Elliot Scheiner; recorded at Mountain Recording Studio, Montreux, Switzerland, and Lower Dean Manor, Gloucestershire, England.] Warner Bros. 25059-1.

Performance: **Vocally strong**
Recording: **Safe**

As the silent backbone of Fleetwood Mac, Christine McVie, with her breezy, beatific pop, balances the shopping-mall mysticism of Stevie Nicks and the sometimes pompous eccentricities of Lindsey Buckingham. Sadly, the first chance she has to apply her marvelously brooding

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voice to a solo album since Fleetwood Mac's rise in the late Seventies suffers from a lack of strong material and the predictably crystalline production of Russ Titelman.

The strength of McVie's voice lies in its subtlety—midly interesting after the first listen, intriguing after the fifth, irresistible after the tenth. Her creamy soulfulness stands somewhere in between Nicks's raggedness and Ronstadt's cold polish, and she sounds a bit darker and more blues-oriented on this album, even as she sings the most optimistic love songs. It's the songs themselves that disappoint. "Love Will Show Us How" moves at a faster pace than usual for McVie, and she handles the vocal in a single breath; but just as the guitars get a little jagged or furious, they recede in the mix. In spite of McVie's building anger on "I'm The One," the storyline about a stray lover is cliché-ridden and the Cars-like hooks—which begin with an inkling of force—never quite catch on.

One of the major problems is the lack of a discernible instrument to accompany McVie's voice; neither her own keyboards, or the guitar of Todd Sharp, nor any of the guest playing by the likes of Buckingham, Eric Clapton and Steve Winwood fill the bill. Everyone continuously compliments everyone else—an inspired half-solo here, and catchy half-riff there. Titelman's production is so homogenized (digitally, no less), that to get any kind of presence in the bass or drums you have to turn the bass control all the way up, which in turn diminishes the power of the lead vocal—the main reason for listening in the first place.

There also seems to have been an attempt to keep the Fleetwood Mac sound intact, a move that has limited McVie's songwriting. A cut like "Got A Hold On Me," with its seamless harmonies, would make a good fourth single from *Mirage* or *Tusk*, but fails as a keynote first single here. Only once with "Ask Anybody," a McVie/Winwood collaboration with a lilting melody, sharp but unassuming piano fills, and a vocal that alternates between consternation and confidence does McVie the songwriter and arranger measure up to McVie the singer. The rest of the bright spots, such as the opening of "The Smile I Live For," in which McVie sings alone with just piano, are sporadic and short-lived. Christine McVie has a great enough voice to

make mediocre songs and production sound better than they are, but unfortunately, on *Christine McVie*, it's not enough.

rob hoerburger

KIP HANRAHAN: *Desire Develops An Edge.* [Kip Hanrahan, producer; David Rodriguez, Jon Fausty, engineers; recorded at Latin/Eurosound Studios, New York City.] American Clave 1009LP/1008EP.

Performance: **Sincere, sensuous, sizzling**
Recording: **Perfectly precise**

Latin rhythms have long flavored American jazz and rock. Carlos Santana established the commercial viability of grafting Latin rhythms onto San Francisco rock nearly two decades ago. Eddie Palmieri has experimented with Afro-Cuban rhythms within a jazz context utilizing a big band format. As partisan as I have always been to Latin percussion, for some years I have been waiting for a recording that would represent an imaginative advance in the genre of Latin rock and jazz.

Kip Hanrahan's new album represents that startling and revolutionary new form. He has composed a unified and daring song cycle that makes an intensely personal and idiosyncratic new form of Latin polyrhythms. *Desire Develops An Edge* is not simply a rock or jazz record with Latin underpinnings; it is a glorious fusion of all genres.

Hanrahan's genius (and the over-used term "genius" is not inappropriate in this context) was to gather an unlikely band of highly diverse and creative musicians and to allow them to improvise around open-ended song structures. Outstanding and little known Third World musicians like Haitian guitarist Ti'Plume Ricardo Franck and Cuban percussionist Puntilla Orlando Rios play dynamically and dramatically with the cream of New York's jazz artists like bassists Jamaaladeen Tacuma and Steve Swallow. Jack Bruce, formerly of the seminal English rock band Cream, sings with the most

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aching sincerity and sensuality I have heard from any male singer in rock or jazz in years. He is, at the same moment, diffident and cool while being roarily engaged and passionate.

Hanrahan supplies Bruce with exceedingly complex lyrics, full of stream-of-consciousness mouthfuls of "this-is-Soho-don't-you-know" poetry. That Bruce makes such ironic, ponderous, and sometimes downright pretentious lyrics sound so natural and convincing is a triumph of considerable merit. Hanrahan's lyrics throughout this two record set involve seeing through knotty moments of life filled with sexual and political tension. This is very existential stuff that treads a fine line between corniness and real profundity. The accompanying musicians make the message profound to the utmost.

There is not one cut among the seventeen that isn't musically noteworthy. I'm particularly fond of the sardonic lyrics sung by Bruce on "All Us Working Class Boys," a song buttressed by Ricky Ford's exquisitely driving yet coolly mannered tenor sax. "Sara Wade" opens with some fancy clave beating by Jerry Gonzalez that is strikingly chic and exact. Steve Swallow's bass line on "Trust Me Yet?" is an amazement and should be an inspiration to the generations of electric bass players to come. The drummers on every cut give every song a romantic buoyancy and fervor that is fetching. Hanrahan often speaks of his music tonally, using the metaphoric language of film. The collective impact of these musicians is to create a soundtrack to perfectly accompany a grainy, monochromatic old French film about lovers about to end—or about to begin?—the affair of their lifetimes.

This album is my nomination for the most mature and daring jazz composition of the year.

Kudos should also go to the producer and engineers for capturing such a crisp and bright sound. Kip Hanrahan, in the press kit accompanying this album, warmly thanks engineers Jon Fausty and David Rodriguez; and well he should. The balance that they provided in the recording of extremely complex percussionists often playing in counter-rhythm to each other is fantastically established. Bruce's soulful vocals are never lost in the teaming jungle of percussionists, guitarists, bassists and sax players.

Never have I heard Latin percussion recorded with such depth and lucidity.

In spite of this record being musically and sonically superior to 99 percent of what the major record labels grind out every year, it might not be easy to locate in your town. It is on the tiny American Clave label, which is handled by New Music Distribution Service. Their mail order catalog is available free by writing to 500 Broadway, New York, N.Y. 10012.

The uncannily odd title of this album first brought it to my attention. The superior musicianship, inventive amalgam of form, and gnomic lyricism will keep bringing it back into the field of my attention for many years to come. Would that more of our rock and jazz reveal such deep felt stirrings of desire.

norman weinstein

SUGAR MINOTT: *Sufferer's Choice*.

[Peter Thompson and Sugar Minott, producers; Soljie Hamilton, engineer; recorded at Channel One Studio, Kingston, Jamaica and Aquarius Studio, Kingston, Jamaica.] Heartbeat Records 21.

Performance: **Seductively smooth crooning about the body politic**

Recording: **Channel One Studio earns its number one status**

"Lover's Rock" is a style of reggae music that has never received the public notice in this country that it has in Jamaica. Two of the best known singers operating in this genre who have won acclaim in the States are Dennis Brown and Gregory Isaacs. Both possess voices of remarkable sweetness and suavity; it would not be a disservice to call them the Jamaican reincarnations of Johnny Mathis. Yet their original songs shatter such a comparison immediately. Brown and Isaacs write about male sexual prowess with sweet young things, and are lyricists of macho and (some feminists would claim) sexist posturings.

Neither Brown nor Isaacs have exclusively recorded "how-big-is-that-male-ego-in-the-window" songs. Both have composed and recorded stridently political statements protesting poverty in Jamaica. But "Lover's Rock," for all of its political

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sidetracks, is essentially a seductively male telegram to any and all female fans with erotic inclinations.

Sugar Minott (his real name is Lincoln; he claims the nickname refers to a youthful hankering for candy. Believe him?) has released a large number of albums over the years that belong squarely in the "Lover's Rock" genre. None of his releases sounded as polished as the productions of Brown and Isaacs to me—until this. *Sufferer's Choice* marks a mature advancement over his earlier works. It might even mark the maturing of a hitherto immature and shallow category of reggae.

Minott has struck a perfect balance on this album between erotic come-ons and political sermons. Side one is largely social protest and opens with Minott gruffly and urgently complaining about the "rough ole life" in the ghetto. Not only is the song lyrically concise and convincing, but the rhythm tracks by the ubiquitous Sly Dunbar and Robbie Shakespeare are catchy and hypnotic. "Uptown Ghetto" has an ominous refrain of "They're taking the ghetto uptown/they're tired of being on the ground," which makes perfect sense in terms of New York as well as Jamaica. "The Half" has Minott assuming the moral rectitude one would expect from Bunny Wailer as he rails against the sin of vanity. These are elegantly written songs with a rhythmic spine as unyieldingly tough as finished iron girders. The two most widely abused studio tricks in reggae recording—echo and reverb—are utilized with remarkable taste and restraint throughout.

Side two would not be a hit if played at the offices of *Ms.* magazine. "Lover's Race" has Minott complaining (!) about the difficulty of having two lovers simultaneously and suggests, apparently without irony, that if the two ladies refrain from jealousy, "everything will turn out just fine." Good luck. "Have You Ever Found a Love" has Minott bragging about what a good lover he was to an unappreciative female. For all of the blatant sexism running rampant through side two, there is also a curious paradox. There is a quality of awe and appreciation for the female implicit in the crooning, lifting tone of Minott. This is a voice obviously schooled in all of the nuances of American r & b and gospel. The breathy eroticism is infused with a churchy fervor. In

fact, I find an analog to Minott's singing in Marvin Gaye's recent work. Minott has the same proud and coolly detached sensuality; an angel ripe with libido. The most outstanding song on this side is "Keep On Loving You," which is built upon a terrifyingly eerie bass riff recorded with perfect clarity. It sounds like a lover's lament mixed with the determination of "We Shall Overcome."

Sufferer's Choice was mainly recorded at the legendary Channel One Studio in Kingston, Jamaica. The number of international reggae hits that have emerged from this studio simply boggles the imagination. Heartbeat Records has recently released a compilation called *The Best of Studio One*, and it is a worthy tribute to the great music taped there. This album has that characteristic Channel One sound: snappy rhythm tracks sparkling throughout the mix, brightly mic'ed vocals, a tonal balance that embraces the hard metallic sound of electric guitars, as well as the soft colors of an acoustic piano.

Reggae production nearly always favors bass and drums over the other elements in the mix. To do so without reducing the vocals and guitars to sludge requires exceptional care. Minott and Thompson have obviously exercised that quality in spades.

In spite of having a title suggesting suffering, this album will introduce songs of honey-smooth passion into your days.

norman weinstein

LOS LOBOS: ...And A Time To Dance. [T-Bone Burnett and Steve Berlin, producers; Mark Linett, engineer; recorded at Warner Bros. Recording Studios, N. Hollywood and Enactron, Burbank.] Slash 29963-1.

Performance: **Uncompromisingly rousing and robust**

Recording: **Uncluttered**

This reviewer has a positive bias toward ethnicity in everything from restaurants to music. At a time when so much top-40 radio consists of bland pap devoid of ethnic signature, the success of a group like Los Lobos warms my cynical soul. Here is a rock quartet from East Los Angeles (the Chicano part of town) that uncom-

promisingly maintains its musical identity as an ethnic force in the Tex-Mex community—while attracting a wide multiracial audience.

The Chicago impact on mainstream American rock music is not a tale that could fill volumes. The best known names that come to mind when speaking about that impact are Ritchie Valens (whose classic "Come On, Let's Go" is given a revitalized and emotionally urgent treatment on this record) and Carlos Santana. There is no doubt in my mind after repeated listenings to...*And A Time To Dance* that Los Lobos has the potential to join those ranks.

Several factors contribute to the power of this band. There is a remarkable sense of group cohesiveness evident from the opening notes of this seven song EP. With over a decade of playing together and two self-produced albums behind them, Los Lobos has evolved from an all acoustic band playing Mexican folk music to an American rock unit with a Mexican musical vocabulary and "feel."

The EP opens with "Let's Say Goodnight," which establishes the tone for the collection. The song furiously rocks—with an accordion (!) being the lead voice. David Hidalgo's whirling accordion leads are met by Louis Perez's powerhouse drumming. The cut is saucy, terse, tense, comic, nasty, and a musical gem. The unexpected sound of Los Lobos is also dramatized by "Walking Song," which showcases a very Charlie Christian-sounding guitar section. "Anselma" is one of two Mexican songs sung in Spanish (translations are included on the inner sleeve) which manage to rock in terms of American rock while maintaining a "roots" feeling connected to Latin America. "Why Do You Do" adds the frenetic tenor sax of co-producer Steve Berlin. Yet the number would probably succeed just as well without Berlin's wails. There's not a weak cut on the record. Criticisms? Why an EP when a band this dynamic is worthy of a full LP?

Berlin and Burnett were recently interviewed in a New York music magazine about their roles as producers of Los Lobos. Said Berlin: "There wasn't a whole lot for me to do but stay out of the way." Said Burnett: "Mostly I was just listening." The album was recorded live and there is an electric and spontaneous tone to this EP that I found immediately appealing. The guitars of David

MODERN RECORDING & MUSIC

Hidalgo and Cesar Rosas are brightly captured in their metallic clamor. Conrad Lozano's bass and Louie Perez's drums are tightly tracked. This is a very uncluttered album of dance music to make you click your heels on the most cluttered of dance floors.

norman weinstein

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nat hentoff

Finding The Melody, And Then Some: Dave McKenna and Sphere

It's commonplace among jazz musicians to say that Dave McKenna is nonpareil, one of a kind. He's made a number of pleasurable albums and yet, I've been waiting for that one set which would preserve the very best of McKenna — when he's really rolling in a jazz club, really getting it all together with that momentum that could knock down trees which got in the way of his music.

That album has finally arrived — "A Celebration of Hoagy Carmichael" on Concord, recorded last year in Bloomington, Indiana, Hoagy's birthplace (McKenna went there to play during the inaugural weekend of The Hoagy Carmichael Jazz Society). On the album, McKenna is all by himself, which is how he likes it, and everything works: that use of space which gives so much breathing room to his improvisations, the building of climax upon climax, the depth and ease of the beat, the wit, a tenderness, and delight in the rides you can take with this music.

Along with "Stardust," of course, and "Lazy River," there are such rediscoveries as "One Morning in May" and "Come Easy, Go Easy Love." Carmichael once said: "You don't write melodies, you find them. They lie there on the keys waiting for you to find them." And that's how his songs sound. What McKenna does is to find the melodies inside the melodies, and then the melodies inside those. The recorded sound, as I have come to expect from Concord, is clean and vivid without being in the least tricked-up.

Sphere, now in its second year, began as a continuation of the musical heritage of Thelonious Monk. Most closely identified with Monk is Sphere's tenor saxophon-

ist Charlie Rouse, who was with Thelonious for a very long stretch. The rhythm section is one of the most enliveningly and incisively swinging in jazz — pianist Kenny Barron, drummer Ben Riley, and Buster Williams, who may have the most envelopingly warm sound on bass of all his contemporaries.

The first album by Sphere consisted entirely of Monk compositions. This time, wisely, there's only one by Monk. The others encompass a standard ("If I Should Lose You") and originals by Rouse, Barron, and Williams. This way, while continuing to keep its ties with Monk, Sphere can also make its own musical identity clear.

In addition to the solo strengths of all involved, this combo has really become a *unit* in the past year. As Kenny Barron says, "When performing in a quartet setting, it is very easy to come across sounding like a jam session band. One of the things we've been striving for with this band is to sound like a *band* — a tightly knit, cohesive group." And so it is. Cohesive, but also flowing and full of surprises.

The engineering is sensitive to the fine balance between solo and ensemble priorities, and the sound throughout has the mellow immediacy that is the essence of Sphere.

DAVE MCKENNA: "A Celebration of Hoagy Carmichael." [Harvey Phillips and Carl E. Jefferson, producers; Wayne Gunn, engineer.] CONCORD RECORDS CJ-227.

SPHERE: Flight Path. [Damu Productions, Ltd., producer; Rudy Van Gelder, engineer.] ELEKTRA/MUSICIAN 60313-1.

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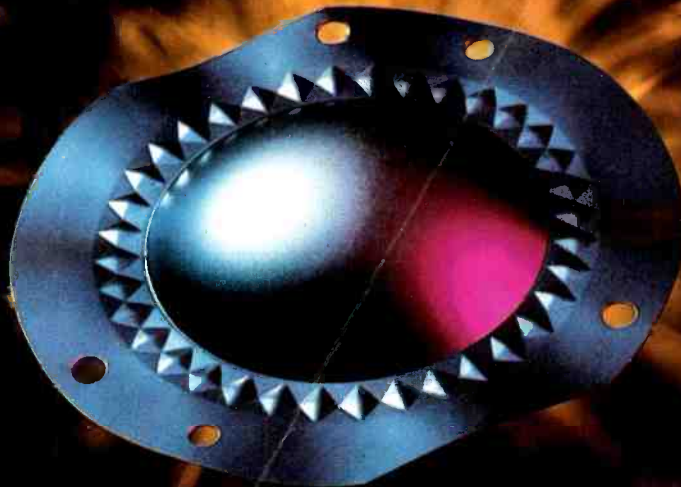
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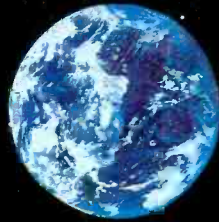


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