

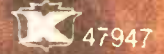
Gandy Newman

MODERN

# RECORDING

& MUSIC

OCTOBER 1984  
VOL. 10 NO. 10 \$2.25



## NILE RODGERS

SOUND ADVICE:  
Equalization

LAB REPORT:  
Revox PR99 2-Track  
Recorder/Reproducer

MUSICIAN'S NOTEBOOK:  
Pulsar Series 40  
Matrix Mixing Console

RECORDING TECHNIQUES:  
Amplified Instruments And Drums

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PR99 MKII with optional carrying case and monitor panel. Roll-around console also available.

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# MODERN RECORDING & MUSIC

## FEATURES

### 6 RECORDING TECHNIQUES

by Bruce Bartlett

An update on the various methods of recording amplified instruments and drums is presented in this detailed report.

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by Susan Borey

Anyone who has produced the likes of David Bowie, Mick Jagger, Duran Duran and many others, master-minded the innovative funk group Chic, and recorded brilliantly on his own, must be doing something right. Nile Rodgers, who also plays one mean guitar, seems to do *everything* right. In this exclusive interview, *MR&M* probes Rodgers about his magic touch in the studio on both sides of the glass.

### 28 EBN-OZN: COMPUTER GAMES

by Larry Jaffee

The recent dance hit "AEIOU Sometimes Y" and the followup album *Feeling Cavalier* only hinted at the computerized creativity at work behind the music of the dynamic duo known only to the world as EBN-OZN. *MR&M* went behind the boards with Messrs. EBN and OZN to examine their use of computers in formulating state-of-the-art musical madness.

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by Bill Milkowski

Randy Newman has been one of the most misunderstood artists in popular music for over a decade. However, filmmakers understand that if they would like a superb musical score for their projects, Newman is the man to call. The composer/pianist's most recent soundtrack was for *The Natural*, the highly successful Robert Redford vehicle. In this rare interview, Newman discusses his work for the silver screen.

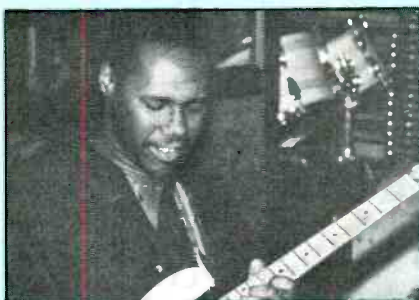


Photo by John Bellissimo



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## A Few More Words About Spoken Word

Bruce Bartlett's article "Recording The Spoken Word" (*MR&M* May '84) is indeed of value, especially to the smaller studio engineer...yes, there are bucks to be made out there by recording the spoken word.

Since I was probably the worst rock mixer in the Western Hemisphere, my recording studio experience was primarily in recording and editing radio commercials, slide films, and film sound tracks. (Besides...oh heresy to admit it in *MR&M*'s pages...I enjoyed it more.) Anyhow, after years of making slightly-tipsy-after-a-tee-martoonie-lunch executives sound like Clarence Darrow, I can offer a few more tricks for recording VOX.

I always recorded "flat." There are enough variables with-out worrying about duplicating EQ, since inserts might be recorded days later. The humidity has changed and the air is different—the announcer is slowly getting a head cold—and yes, your voice is lower in the morning than at the end of the day. (You're also taller in the AM, but that's another subject.) With all these potential problems it really is easier to "fix it in the mix."

When doing a retake, have the announcer go back to the sentence before the flubbed sentence. There's usually a change in inflection because of what has been previously said, so have the announcer "read into it" and it will edit more naturally. Yes, it is easier to edit in the pauses, but a good editor will soon learn to edit within the sound, too. The first time you make a singular into a plural or vice-versa, and the client doesn't have to bring back the talent for another session, you will be called Wizard...and have a very, very loyal client.

It is valuable to record some room ambience at the end of the session. Later you may have to lengthen sections of narration to fit visuals or music effects, and leader tape has *no* sound. Your studio has *some* characteristic ambience...unless you happen to have a real anechoic chamber. "Don't touch that dial" and record a minute of silence (with the announcer still sitting at the microphone) and you will have silence to splice in that matches the rest of the silence. This is especially important in film work.

Popping is a problem, and I'm not just proffering a pun. Some people have a real problem with plosive sounds and a gale of wind comes out of their mouths with each and every P. A windscreen is standard operating procedure. In extreme cases, the announcer can read the sentence with two extended fingers held a couple of inches in front of the mouth. This can help in "breaking the wind." (There's the pun.) Of course if the copywriter has come up with things like: "The perennial problems with the pear picking process prevented Paul's parents from...." Well, then, you might want to sit down with

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Acoustic foam "pop" and moisture filter.

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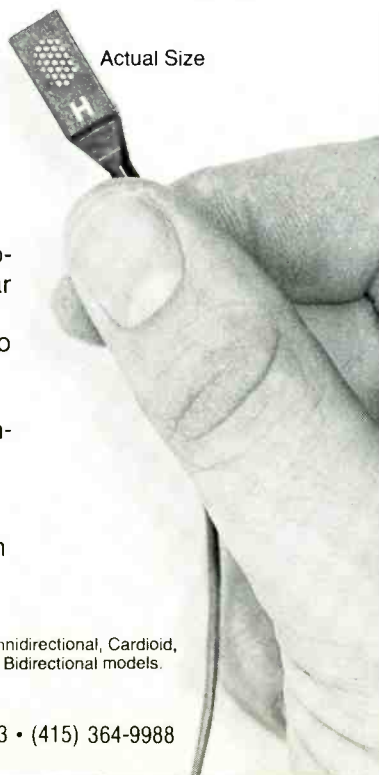
Compare the Isomax II to any other microphone. Even though it measures only  $5/15'' \times 5/8''$  and costs just \$189.95,\* it equals any world-class microphone in signal purity.

And Isomax goes where other microphones cannot: Under guitar strings near the bridge, inside drums, inside pianos, clipped to horns and woodwinds, taped to amplifiers (up to 150 dB sound level!). Isomax opens up a whole new world of miking techniques — far too many to mention here. We've prepared information sheets on this subject which we will be happy to send to you free upon request. We'll also send an Isomax brochure with complete specifications.

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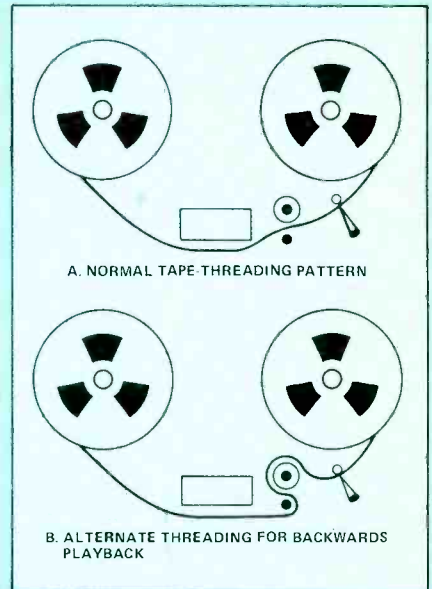
\* Pro net price for Omnidirectional, Cardioid, Hypercardioid, and Bidirectional models.

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the producer for a rewrite.

Back-timing is an essential trick, but there's an easier way to do it with an alternative threading pattern that works on most all machines. Refer to the drawings which follow. No need to remove the reels...just re-thread as the picture shows, punch the PLAY button, and watch in rapt amazement as your machine plays backwards! (This even works with  $1/4$ -track machines where flipping the reels would only play the two unrecorded tracks.)



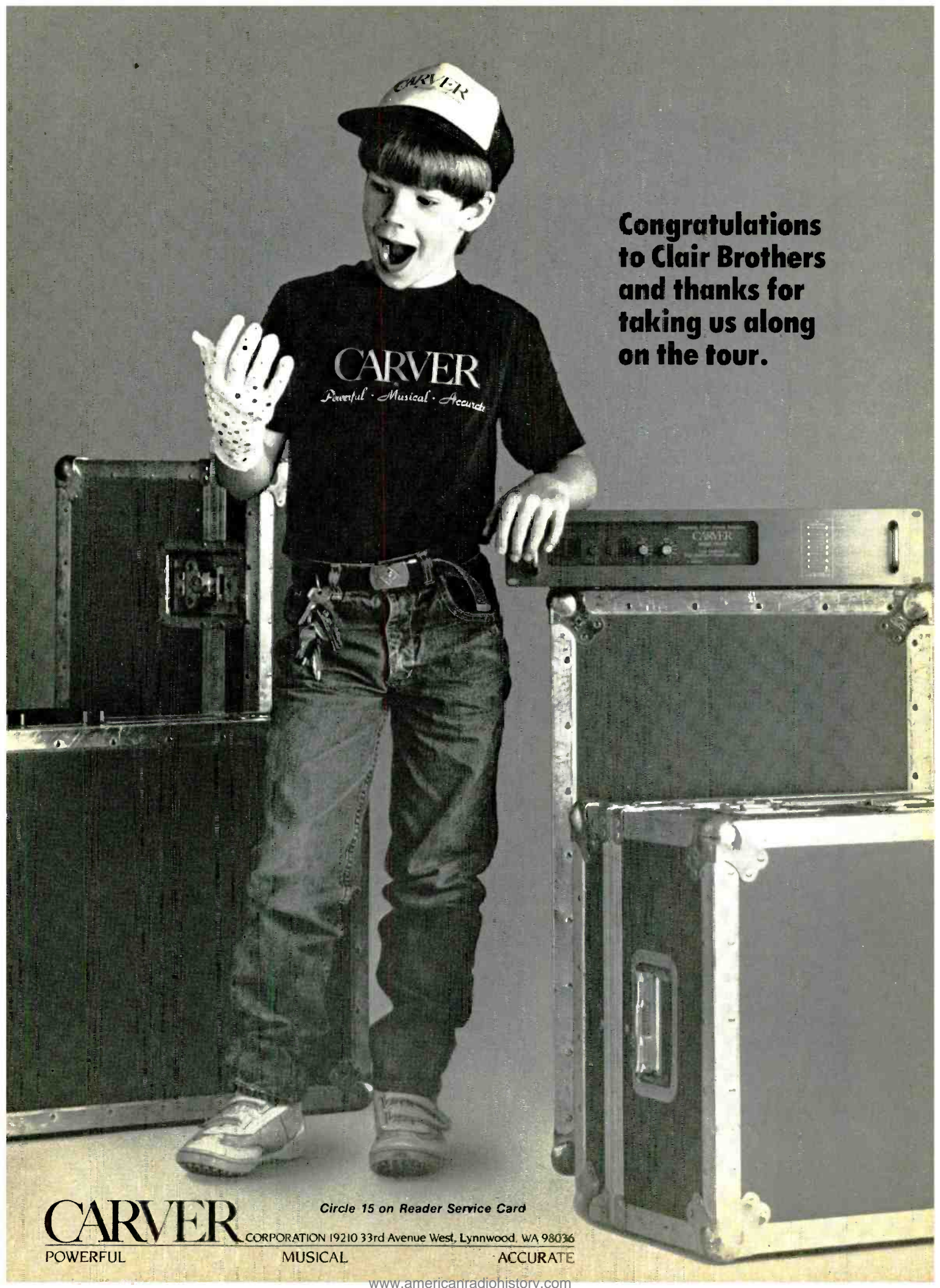
While recording the spoken word may not be as exciting as a 24-track session with a major group, making little mini-dramas with narration, sound effects, and a music track can be a rewarding creative experience... and help pay the rent, too.

—Larry Gorjup  
Cleveland, OH

## Do-It-Yourself Equipment Racks

This is an answer to the "S.O.S. from Glenn Scott" in "Talkback" from the July 1984 issue of *MR&M*: Very inexpensive equipment racks may be built from metal shelving standards (metal angle brackets with holes every inch or so). With a drill and a hacksaw you can fabricate anything you want. One problem is that the holes are not always exactly where you may want them. Best of luck!

—Robert Noland  
Austin, TX



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# Recording Techniques

## Amplified Instruments And Drums

The "Recording Techniques" series has been running for 2½ years now. We've amassed a lot of information in that time. If you've missed some of the series and would like to get an early article, write to *MR&M* for the appropriate back issue.

Here's a list of the articles published so far:

Sept. '80—Stereo Mic'ing Techniques  
 Feb. '82—The Recording-and-Reproduction Chain  
 Mar. '82—Studio Acoustics  
 May '82—Microphones  
 July '82—Mic Technique Fundamentals and Two-Mic Recording  
 Aug. '82—Amplified Instruments and Drums

Sept. '82—Vocals and Acoustic Instruments  
 Oct. '82—Mixing Console Theory  
 Nov. '82—Operating the Mixing Console  
 Dec. '82—Signal Processors  
 Feb. '83—Tape and Tape Recorders  
 Mar. '83—Monitoring Part 1  
 May '83—Monitoring Part 2  
 June '83—Session Procedures  
 July/Aug. '83—The All-Electronic Mini Studio  
 Sept. '83—Creative Sonic Effects  
 Oct. '83—Hum Prevention  
 Nov. '83—What is Good Sound?  
 Dec. '83—Mic Techniques for Realistic Reproduction  
 Jan. '84—The Pressure Zone Microphone

Feb. '84—Buyer's Guide to Low-Cost Equipment  
 Mar. '84—Helpful Procedures and Flowcharts  
 Apr. '84—On-Location Live Recording  
 May '84—Recording the Spoken Word  
 June '84—How to Tame Feedback  
 July '84—dB or not dB  
 Aug. '84—AES Conference Part 1  
 Sept. '84—AES Conference Part 2  
 Oct. '84—Amplified Instruments and Drums, II

### Recording Electric Guitar

Let's return to our topic: effective methods for recording amplified instruments and drums. The electric



**It proves  
its worth.**

While others have introduced more expensive reverbs that don't sound like they're worth it, or lower-cost units that don't deliver quality, Orban's 111B Dual Spring Reverb continues to prove its worth.

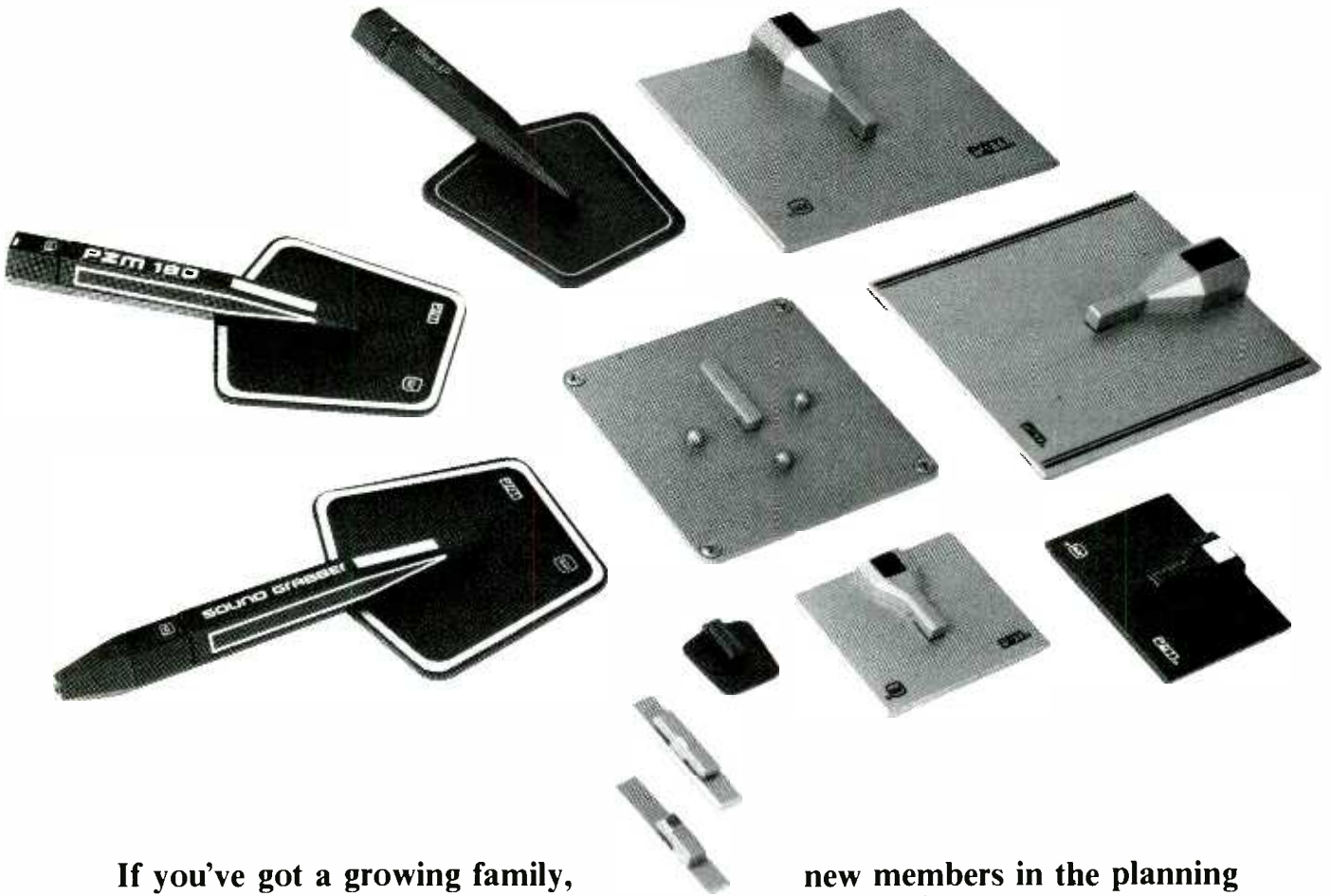
Why? Because the Orban 111B offers good, clean sound that most studios and production rooms demand at a fair price. Our proprietary "floating threshold peak limiter" protects the springs from being overdriven on transients. So the 111B doesn't sound "twangy"—just bright and clean, with a sound that complements tracks instead of muddying them. And flexible EQ lets you contour the echo return for any application.

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If you've got a growing family, sooner or later you need a picture with everybody in it. It's a statement of family pride, and we humbly admit that we are pretty proud of this group.

There was a time when most people didn't recognize a Crown PZM® as a microphone - even when they looked at one. Times have changed. *Billboard Magazine* reports in their most recent brand usage survey that 37.5% of U.S. recording studios use Crown PZMs.

This sort of demand, multiplied by many other applications, has made the family grow, with new microphones tailored for new users. In fact, the number of

new members in the planning process is larger than the number in the picture. Since a lot of our friends have only used one or two models so far, we thought we'd better introduce the family. The next time we may not be able to get them all in one picture.

Keep an eye on this family. Right now it's one of the newest and best. It just might get to be the biggest.

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guitar can be recorded in many ways: with a microphone in front of the guitar amp, with a direct box, both mic'ed and direct, or through a signal processor such as the Rockman (see Figure 1).

The style of music you're recording will suggest the appropriate method. Mic'ing the amp is best when you want a rough, raw sound, including tube distortion and speaker coloration. Rock 'n' roll or heavy metal usually sound best with a mic'ed amp. Recording with a direct box, on the other hand, sounds clean and clear, with extended highs and lows. It

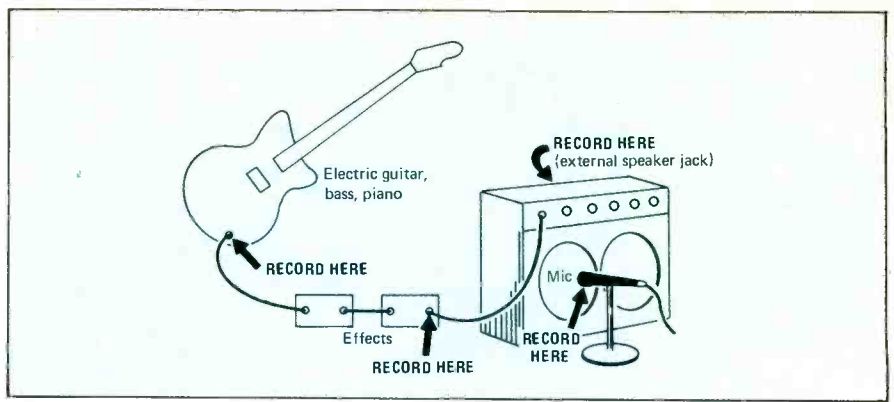


Figure 1. Recording an amplified instrument system.

might be the best method for quiet jazz or R&B. Use whatever sounds right for the particular song being recorded.

The recorded guitar should sound full-range, so you have something to work with later in the mixdown. The highs should be bright but not too bright; the lows should be warm but not muddy.

First work on reducing any hum heard through the guitar amp. Set the guitar volume and treble controls up full for the best signal-to-noise ratio. Have the guitarist move around to find a null spot in the room where hum disappears. Flip the polarity switch on the amp to the lowest-hum position. You may want to try a noise gate to remove buzzes between guitar notes.

### Mic'ing The Amp

Small practice amplifiers are generally better for recording than large, noisy stage amplifiers. If you use a small amp, place it on a chair to avoid picking up reflections from the floor.

The most popular microphone choice for electric guitar is a cardioid dynamic type with a presence peak in the frequency response (a boost around 5 kHz). The cardioid pattern reduces leakage; the dynamic transducer type withstands high sound pressure levels without distorting, and the presence peak adds punch. Of course, you can use any mic that sounds good to you. A flat-response condenser provides a natural sound for quieter guitar parts.

For starters, mic the amp about four inches to one foot away, with the microphone aiming at the center of one of the speaker cones. The closer the mic is placed to the amp, the bassier the tone is, and the less ambience and leakage are picked up. Placement in front of the center of the speaker cone sounds bright; off-

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# MX1688 Recording Console

16 x 8 x 2 with control room mixing

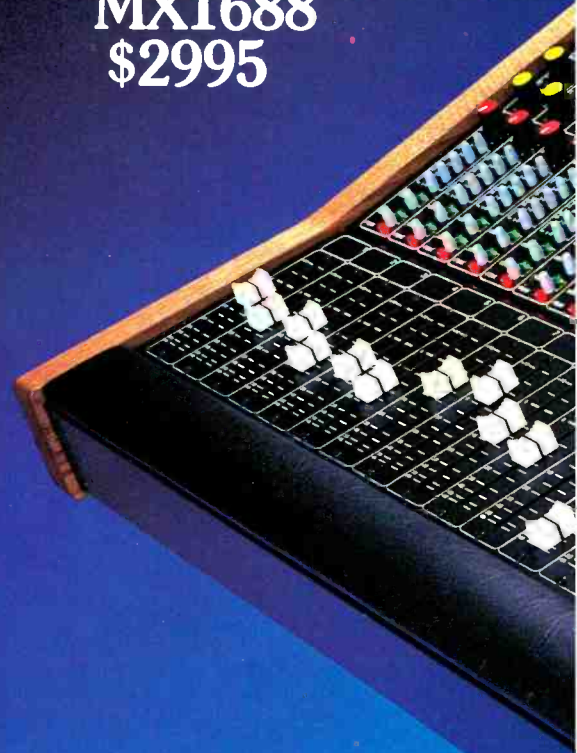
The CARVIN MX1688 is a full function recording mixer designed to serve as the control center for eight-track recording studios. Recording basic tracks, overdubbing sessions, and final mixdown are all handled with ease by the MX1688; signals are automatically routed to the appropriate sections of the console for each recording operation. You will rarely (if ever!) need to reconnect any signal cables with the MX1688. One of the key features provided by the MX1688 but rarely found on PA "recording" mixers is an independent control room monitor mixer with buss/tape source selection. Working groups will find this mixer perfect for the double duty requirements of recording and live sound mixing.

The input channels of the MX1688 include sweepable three-band parametric equalization with defeat switch, four auxiliary mixing busses with pre/post switching and solo/mute functions. Quiet performance starts with an ultra low noise differential mic preamp and is preserved throughout the mixer by careful attention to gain structure and use of the finest low-noise integrated circuits.

Construction of the MX1688 is all modular with individual circuit cards for each channel and master strip. High quality connectors and ribbon cable permit easy field servicing. The same professional quality components as used in \$100K consoles are featured in the MX1688 such as Switchcraft™ connectors, IIT Schadow™ switches, and controls that are optimally damped for smooth operation and made for years of service.

Efficient manufacturing, and direct marketing allow us to load the MX1688 with all the features required for multitrack recording and still offer a price that represents real value. Try it on the job for 10 days and if not convinced that it's better than consoles selling for twice the price, we'll refund your money! Send for your FREE CARVIN 84 pg catalog today or include \$2 for 1st Class mail, \$5 Foreign. For an extensive overview of the MX1688 or MX1644, send \$7 ea for their 32 pg Operating/Service manuals. Refundable with purchase.

**MX1688**  
**\$2995**



# MX1644 Recording/Live Sound Mixer

16 x 4 x 2 with control room mixing

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### Product Information

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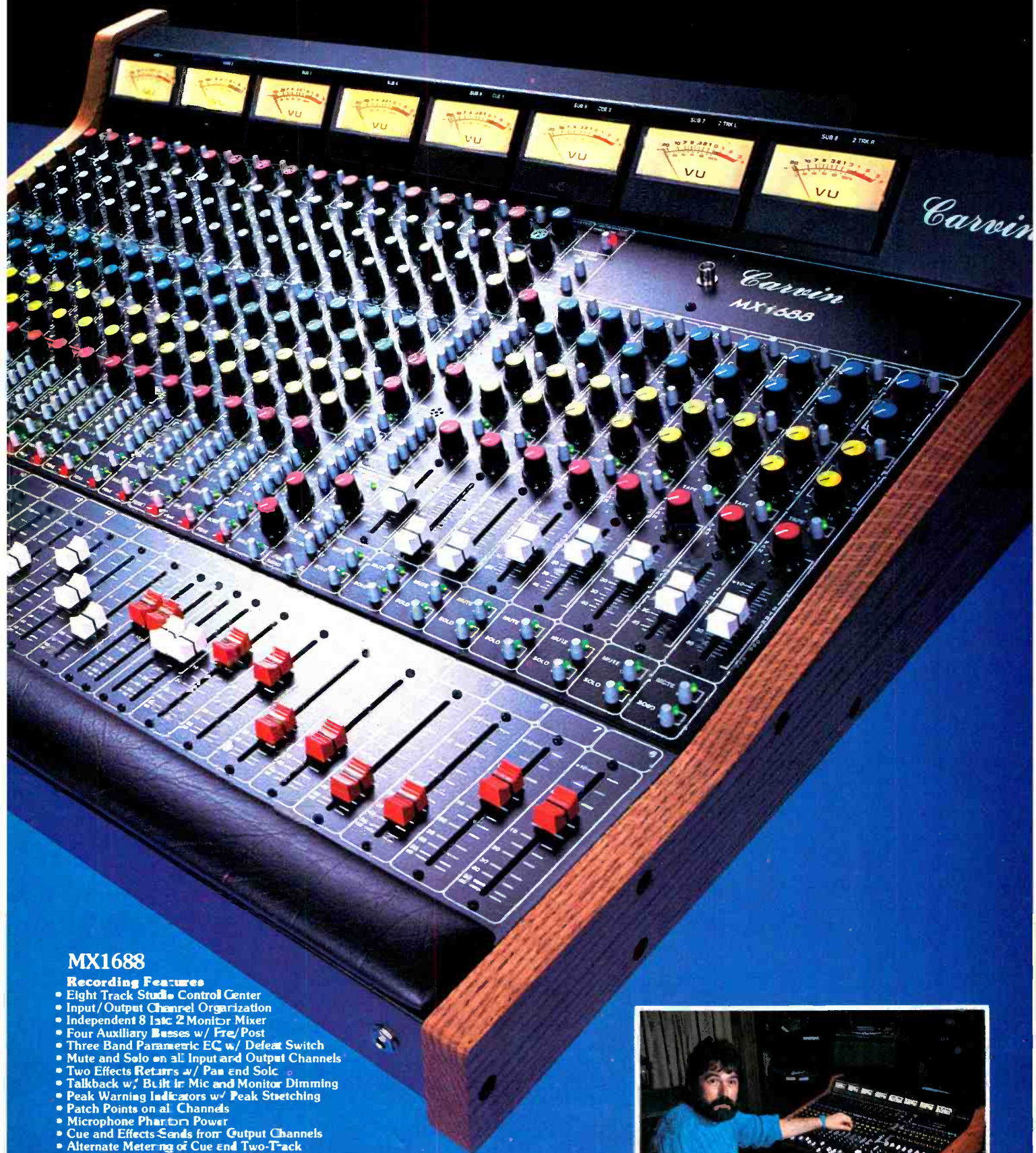
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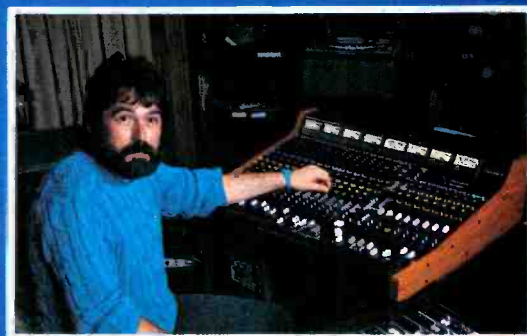
## MX1688

### Recording Features

- Eight Track Studio Control Center
- Input/Output Channel Organization
- Independent 8 Tac 2 Monitor Mixer
- Four Auxiliary Buses w/ Pre/Post
- Three Band Parametric EQ w/ Defeat Switch
- Mute and Solo on all Input and Output Channels
- Two Effects Returns w/ Pan and Solo
- Talkback w/ Built in Mic and Monitor Dimming
- Peak Warning Indicators w/ Peak Stretching
- Patch Points on all Channels
- Microphone Phantom Power
- Cue and Effects Sends from Output Channels
- Alternate Metering of Cue and Two-Track
- Quick Tape Playback Through Monitors
- Independent Mic and Line Preamps
- Studio Feed w/ Source Selection
- Totally Modular Internal Construction
- Input Noise of -127 dBv
- 20 dB headroom at all Stages
- +4 dB or -10 dB Operating Level
- T.H.D. less than 0.5%

### P.A. Features

- Eight Sub-Groups w/ Solo and Mute
- Four Independent Monitor Mixes Available
- Headphone Monitoring of Main or Monitor
- Talkback to Monitor
- 11 Step Gain Controls for Easy Set-Up
- Channels Assignable to L & R Stereo Output



*"The flexibility of the effects and clean layout of the MX1688 allows creative control, usually found only in desks selling at over twice the price I'm very impressed!"*

*— Peter McLan, Producer for Men at Work*

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center placement sounds more mellow and reduces amplifier hiss.

Some engineers like to place three mics side-by-side in front of the amp, plus a Crown PZM on the floor. Then they switch between mics while listening to the guitarist play, and choose the best-sounding microphone. Others mic the speaker front-and-back with two mics switched out-of-phase.

If you're overdubbing a lead guitar played through a huge stack of speakers, you may want to mic the amp at a distance in an acoustically live room. A dynamic microphone

placed five feet away can be mixed with Crown PZMs on the control-room window for ambience.

During overdubs, communications are easier if the musician is in the control room with the engineer. You can still record the guitar amp in the studio while the guitarist is playing in the control room. Here's how: Plug the guitar directly into the mixing console or through a direct box into a console mic input. Then use that input's cue send to send the guitar signal to the headphone junction box in the studio. Patch that box into the guitar amp input (keeping

the cue level moderate), and mic the amp. Monitor and record the microphone signal.

## Recording Direct

Now let's consider recording direct (also known as "direct injection" or "DI"). The electric guitar produces an electrical signal, so it can be plugged right into the mixing console; no microphone is needed. Since the mic and guitar amp are bypassed, the sound is clean and clear. It lacks the distortion and coloration of the amp (but remember that amplifier distortion is desirable in some songs).

If you can use a short cable from guitar to mixer, and your mixer has a high-impedance unbalanced mic input, then you can plug directly into the mixer. If your mixer has 3-pin balanced mic inputs, then you need a direct box. This converts the high-impedance unbalanced guitar signal to the low-impedance balanced signal required by the mixer.

To record with a direct box, plug the electric guitar into the direct box, and plug the direct box into a microphone input. Some direct boxes let you record off the amplifier's external speaker jack to pick up distortion. These boxes often include a lowpass filter to simulate the frequency response of the guitar-amp speaker.

If you want to record the guitarist's special effects, connect the output of the effects boxes into the direct-box input.

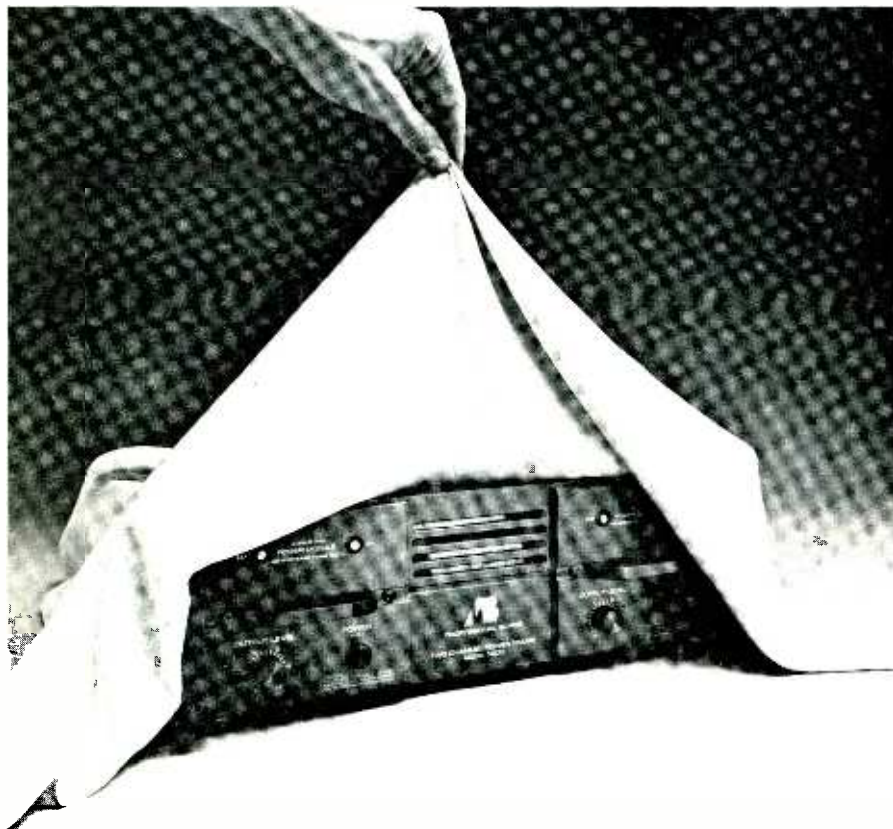
The direct box should have a *ground lift* switch to prevent ground loops and hum. Set it to the lowest-hum position (usually lifted).

Some engineers like to record a combination of direct sound and mic'd sound.

These direct-recording methods apply to electric piano and electric bass as well. Some electric pianos require two direct boxes because they have dual (stereo) outputs.

## Electric Guitar Effects

Often a "thick" or "spacious" lead guitar sound is desired. One way to get it is to send the guitar signal through a delay line set to a few milliseconds delay. Pan the direct signal left and the delayed signal right. Or, send the guitar signal to a harmonizer for a slight pitch change. Delay the pitch-bended signal 15 to 20 msec., pan it to the right, and pan the direct signal to the left. Adjust the direct and delayed levels to spread the guitar between your monitor speakers.



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Still another way to thicken the sound is to *double* the guitar. Have the player re-record the same part in sync with the original part. Pan the original part left and pan the doubled part right. Or, "Y" the guitar cord to feed the guitar amp (recorded on the left channel) and a Leslie organ speaker (recorded on the right channel). You'll hear a spacious, swirling sound. Other popular effects are reverb, stereo chorus, and extreme compression.

The Rockman X100 by Tom Scholz is a signal processor that adds many different effects to an electric guitar. You simply plug the electric guitar straight into the Rockman, adjust the switches for the desired sound, and record the signal direct from the Rockman. You wind up with a fully produced sound with a minimum of effort. Another processor worth checking into is the ESP Pocket Studio. Both sell for around \$300.

### Electric Bass

Now let's turn to the electric bass guitar. As always, you first work on the sound of the instrument itself. Put on new strings if the old ones have become dull-sounding. Adjust the pickup screws (if any) for equal

output from each string. Also adjust the intonation and tuning.

The electric bass is almost always recorded direct for the cleanest possible sound. A direct pickup provides deeper lows than a mic'ed amp, but the amp gives more midrange punch. A combination of direct and mic'ed sound is popular; the amp rounds out the sound while the direct signal provides clarity and a deep low end. The microphone can be a condenser or dynamic with a good low-frequency response, placed a few inches to one foot away from the amplifier/speaker.

When combining direct signals and microphone signals, make sure they are in-phase with each other. To do this, set them to equal levels and reverse the polarity of the direct signal or the microphone signal. The polarity that gives the most bass is correct. You may want to delay the direct signal slightly to coincide with the microphone signal.

Once you're satisfied with the basic pickup, have the musician play some scales from lowest to highest notes to see if any notes are louder than the rest. You may be able to set a parametric equalizer to reduce the level of these notes.

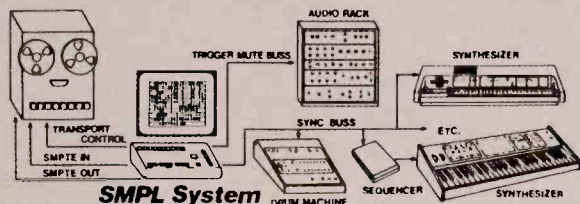
The bass guitar should be fairly constant in level (a dynamic range of about 6 dB) to be audible throughout the song, and to avoid saturating the tape on loud peaks. To achieve this, the bass guitar signal is typically run through a compressor. The compression ratio is set about 4:1; attack time is fairly slow (10-20 msec) to preserve the attack transient, and release time is fairly fast ( $\frac{1}{4}$  to  $\frac{1}{2}$  second). If the release time is too fast, harmonic distortion occurs.

EQ can be used to increase the clarity of the bass guitar. It often helps to cut at 125 to 400 Hz, and/or boost at 1500 to 2000 Hz.

Here are some tips on keeping the bass sound clean and well defined: Use no reverb or echo in the bass. If an amp is used in the studio, keep its volume low to prevent muddy-sounding bass leakage into other mics; or monitor the bass with headphones instead. A change to new strings or a different guitar can help. Use the treble pickup near the bridge. Try not to record a lot of extreme low frequencies; they are difficult to put on a record and won't be heard on most systems. Mute the strings with the side of the hand and play with a pick for extra definition.

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# Producer Series™



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If the bass part is full and sustained, it's probably best to de-emphasize the pluck and let the kick drum define the rhythmic pattern. But if the bass and kick drum both are rhythmic and work independently, then plucks should be audible. Listen to the song first, and then get a bass sound appropriate for the music.

To make an electric bass sound like an acoustic, mic the amp for cabinet resonance, and use a noise gate or expander with a rapid decay.

Tom Scholz has come up with a bass guitar signal processor called the "Bass Rockman." It has three-position switches for EQ, chorus, and sustain, as well as a high-frequency compressor and peak clipper.

### Leslie Organ Speaker

This device contains a rotating horn on top for highs and a woofer on the bottom for lows. A typical recording technique is to mic the top and bottom separately, a few inches to a foot away. Aim the top mic into the louvers. It's often effective to record the rotating horn in stereo with a microphone on either side, or with Crown PZMs inside the cabinet.

### Drums

Now let's look at recording techniques for the drum set. The first step is to make the drums sound good "live" in the studio. If the set itself sounds bad, you'll have a hard time making it sound good in the control room.

The drum set is typically put on a riser 1½ feet tall to reduce bass leakage and to provide better eye contact between the drummer and the rest of the band. Gobos four feet tall are often placed around the set to reduce drum leakage into other mics. Or the set is placed in a "drum booth"—a small padded room with large windows—for extra isolation.

When you're tuning the drums, adjust all lugs around the drum to have equal tension. Tom toms have only a narrow range of effective tuning, about ½ step up or down. If the toms or snare drum ring excessively, tape some tissue paper or paper towel to the edge of the heads. To reduce excessive cymbal ringing, apply masking tape in radial strips from bell to rim. Oil the kick-drum pedal to prevent squeaks. Tape

rattling hardware in place with gaffer's tape.

Now you're ready to mic the set. For a tight sound, place the mics very close to the edge of each drum head. For a more open, airy sound, move the mics back a few inches, use fewer mics, or mix in some room mics (such as Crown PZMs or omni condensers) placed several feet away.

Here's a detailed description of typical mic'ing techniques for each element of the drum set:

- **Snare:** Bring the mic in from the front of the set on a boom. Place it about one inch above the rim, angled down to aim where the drummer hits (see *Figure 2*). You may want to aim the snare mic partly toward the hi-hat to pick up both instruments on one microphone.

Either a cardioid condenser or cardioid dynamic microphone works fine; use whatever sounds best for the tune being recorded. Most mics with a cardioid pattern have *proximity effect*, which boosts the bass up close and adds fullness to the snare beat.

If you want to mic the snare and hi-hat separately, bring the boom in

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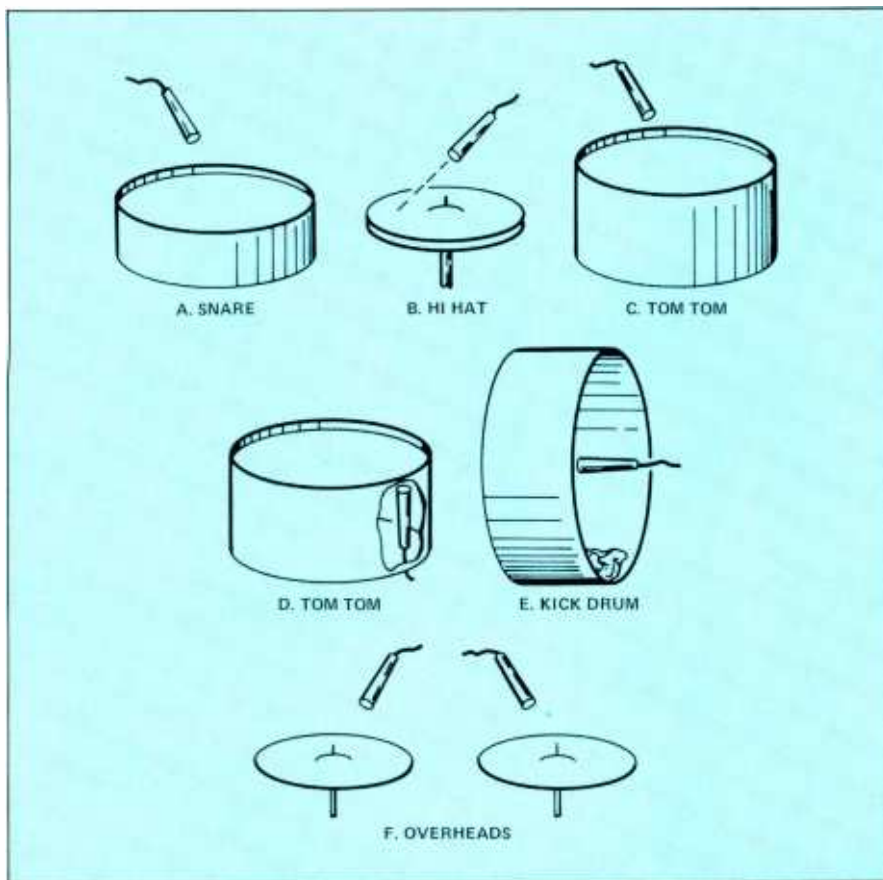


Figure 2. Typical microphone placements for a drum set.

under the hi-hat, and aim the snare mic away from the hi-hat for better isolation.

An alternative technique is to tape a miniature condenser mic to the side of the snare drum so it "looks at" the top head over the rim.

Some engineers like to mic both the top and bottom heads of the snare drum, with the microphones out of phase.

A currently popular effect on the snare drum is gated reverb. There's a short splash of bright-sounding reverb, which is rapidly cut off by the noise gate or expander. Patch a noise gate into the reverb-return signal line.

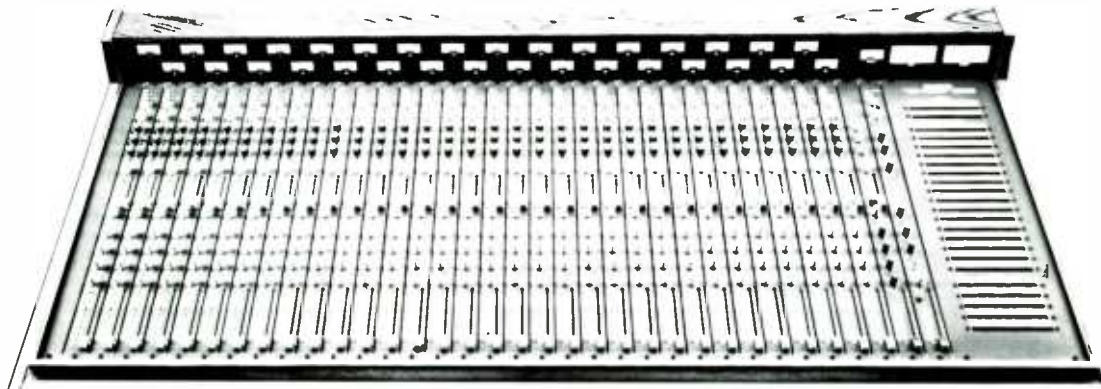
- **Hi-hat:** Usually the snare mic or ambience mics pick up enough hi-hat. But if you want to mic the hi-hat separately, try a cardioid condenser microphone about three to eight inches above the hi-hat, aiming away from the snare drum for isolation. Aim the mic at the point where the drummer hits the cymbals, or aim it at the side farthest from the drummer (see *Figure 2B*).

If the hi-hat needs more sizzle, try boosting a little at 10 or 12 kHz.

- **Toms:** Tom toms can either be mic'ed individually, or with one mic

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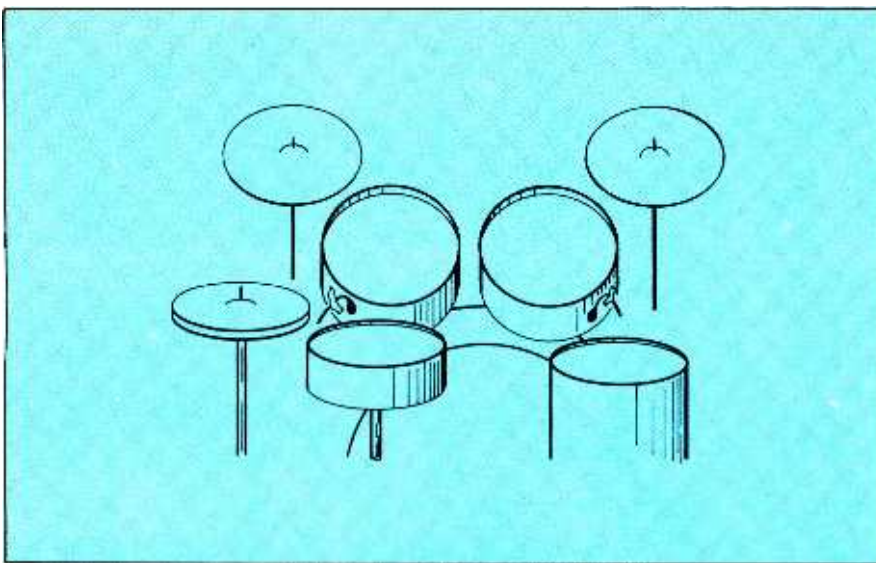
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**Figure 3. Mic'ing a small set with two miniature omni condenser microphones.**

between each pair of toms. One typical technique uses a cardioid dynamic or condenser mic placed one inch above the rim, angled down about 45 degrees toward the drum head (see *Figure 2C*). Again, the cardioid's proximity effect gives a full sound. An alternate setup is to tape mini condenser mics to the toms, peeking over the top rim of each drum.

Tom-tom mics often pick up too much leakage from the cymbals (this leakage is sometimes heard as a low tone). To reduce cymbal leakage and improve isolation, take the cardioid tom-tom mics and aim their "dead" rear at the cymbals. Or remove the bottom heads from the toms and mic them inside a few inches from the head, off-center as in *Figure 2D*. This also keeps the mics out of the drummer's way.

If the sound is too resonant, you can dampen the head vibration with paper towel or tissue taped near the edge of each head. Or cut around 300 to 400 Hz with your equalizers.

- **Kick drum:** Place a blanket inside the drum, pressing against the beater head to dampen the vibration and tighten the beat.

A microphone commonly used in the kick is a cardioid dynamic type with an extended low-frequency response. For starters, place it inside the drum on a boom, a few inches to one foot from the beater head, slightly off-center, as in *Figure 2E*. Mic placement close to the beater picks up a hard beater sound; off-center placement picks up more skin tone; and farther away placement picks up a boomier shell sound.

A miniature condenser mic or PZM can be taped to the inside of the shell on top, about halfway in.

As for EQ, you can cut around 300 to 600 Hz to remove the "cardboard" sound and boost around 2.5 kHz to 5 kHz for extra click or snap.

How should the recorded kick drum sound? Well, they don't call it *kick* drum for nothing. *Thunk*. A powerful low-end thump plus an attack transient.

- **Overheads (cymbals):** Place overhead mics (cardioid condensers) at least one foot away from cymbals to reduce low-frequency ringing. Three to five feet above the cymbals might be better. Two mics overhead can be angled apart for better isolation (see *Figure 2F*). Place them to pick up all the cymbals equally. Usually not much gain is needed on the overheads, since the cymbals leak into the drum mics.

Cymbals can also be mic'ed with mini condenser mics taped to cymbal stands, just under the bell of the cymbal.

Recorded cymbals should sound crisp and smooth, not sizzly, crashy, or harsh.

- **Ambience:** Ambience mics are microphones placed fairly distant from an instrument—about 20 feet—to pick up room reverberation. When mixed with the close-up mics, they give an open, loose, airy sound to the drums. You can use an omni condenser microphone or a Crown PZM attached to the control room window. Sometimes ambience mics are heavily compressed for a special effect.

- **Other techniques:** Crown PZMs

allow some unusual opportunities for drum-set mic'ing. You can strap one on the drummer's chest, tape them to hard-surfaced gobos surrounding the drummer, or put them on the floor under the toms, near the kick drum.

If you're limited in the number of microphones you can spare for the drums, the following setup uses only two miniature omni condenser mics and one kick-drum mic (see *Figure 3*). It works well on small drum sets. Tape one mini mic to the rim of the left rack tom near the snare drum. This mic picks up the left tom, snare, hi-hat, and cymbals. Experiment with placement to get a good balance between these instruments.

Tape the other mini mic to the rim of the right rack tom nearest the floor tom. This mic picks up the right tom, floor tom, and cymbals. The third mic goes in the kick. With a little bass and treble boost, you'll be surprised at the good sound and even coverage you can achieve with this simple setup.

After all the drum microphones are set up, ask the drummer to play. Listen for rattles and leakage by soloing each microphone. Try not to spend more than 10 or 20 minutes getting a sound on the drums; otherwise you waste the musicians' time and wear them out.

To keep the drum sound tight, turn off mics not in use in a particular tune, or use a noise gate on each drum mic.

Electronic drums (such as Simmons) or drum machines (such as LinnDrum) are recorded direct into the console. If the drum machine sounds too mechanical, you can make the sound more interesting by combining real drum sounds with the machine's signal. The machine can play a steady background while the drummer does other things.

When mic'ing drums on stage for sound reinforcement, you don't need a forest of unsightly mic stands and booms. You can use short mic holders that clip onto drum rims and cymbal stands. For club work, the cymbals usually cut through everything, so they need not be mic'ed.

We've covered some typical microphone techniques for amplified instruments and drums. These are just suggestions to serve as a starting point. After trying them out, invent your own techniques, too! If you can capture the power and excitement of these instruments, you've made a successful recording.

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*good times for...*

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susan borey

# RODGERS

nile

Rising from the '70s swamp of thudding, formulaic disco and ultra-busy rock 'n' roll, Nile Rodgers pulled a crisp new sound into focus via Chic, the stylish *mode-Francais* ensemble that scored internationally with the hit single "Good Times." With partner Bernard Edwards, Rodgers then brought his influential reductionist approach to the studio, producing albums for Sister Sledge, Diana Ross and Debbie Harry. Last year Rodgers recorded his first solo album, *Adventures In The Land Of The Good Groove* (Atlantic), in the process spawning a reactionary debate over censorship with one of its songs, "Yum Yum."

With Chic officially on vacation, Rodgers has recently found time to produce material for David Bowie, Mick Jagger, Duran Duran, Jeff Beck, Madonna and INXS, and will soon be working on another solo release.

In this interview, Nile Rodgers, a guitarist, producer, performer and songwriter, discusses his broad career, the influential Chic sound, his home recording gear and techniques, and the infamous Allah and the Knife Wielding Punks.



### Modern Recording & Music:

Nile, only a few people could be interviewed at length on their separate successes as musician, songwriter and producer. Let's run the bases of your broad career. How did you first become interested in playing guitar?

Nile Rodgers: When I moved back to New York from California, in the late '60s, I met some kids who were friends of my uncle. They had a band, minus a guitar player. I thought these guys were really cool and I wanted to belong with them, so I said, "Hey, no problem. I play guitar." I didn't play guitar at all! They just happened to have a guitar there. They brought it out and of course I couldn't play anything. But because I played other instruments and was musically inclined I could figure out the musical symmetry that the guitar has. It's easy to picture the half-steps, and you can figure out mathematically what the tones correspond to. I was able to mock bass lines and play some sort of melody, but I was so embarrassed by this initial encounter that I was then determined to play really well, just so I could show those guys. Of course, they didn't hire me.

**MR&M:** How old were you when this happened?

**NR:** I was 16, and by the time I was 17, I was playing professionally.

**MR&M:** I guess you sort of caught on to it.

**NR:** (laughs) Boy, I sure did. I was just so obsessed with it after I made such a poor showing that first day. I kept practicing and practicing out of these songbooks, but nothing made sense. I had all the finger positions rehearsed but the chords didn't sound right. That was because I didn't have the guitar tuned properly. As soon as I tuned it up it was like magic: everything fell into place. The first song I learned was "A Day In The Life." After that there was a snowball effect because once I could get through a song, I wanted to play more and more. So I just kept going.

**MR&M:** What was the early stuff you were listening to and jamming on?

**NR:** Well, I already played orchestral music on various instruments. I was raised in an ostensibly beatnik household and modern jazz was a very important part of my life. So was classical music. I probably started on the guitar, like most people, jamming on blues because it's a very simple format to improvise on. But early on I started getting into

**Electronic music is popular because it's easy to play. Almost every child I know has some kind of Casio in their house. It's very gratifying to pick up on an instrument and play it right away. But, you know, the cream always rises to the top.**

jazz; learning Wes Montgomery licks, Benson, Charlie Christian. And at the same time, because of my age and the people I hung out with I adored Jeff Beck, Jimi Hendrix and many others. In the '60s and '70s there were so many instrumentalists. Today there's just a handful of people who are really respected as serious guitar players.

**MR&M:** It's been said that guitars are passe. Do you think it's indicative of a trend, and do you think it has to do with electronic music?

**NR:** Electronic music is popular because it's easy to play. Almost every child I know has some kind of Casio in their house. It's very gratifying to pick up on an instrument and play it right away. But, you know, the cream always rises to the top. Anyone can play those things and the only thing that's clever about it is songwriting, putting those sounds together and making something unique. But I still know lots of guitar players that play amazingly well, and that's the group I want to be considered part of, the real musicians.

**MR&M:** You once played in the house band at the Apollo Theatre in New York.

**NR:** The Apollo was an amazing R & B institution. There was a time when they had so many shows a night, like four shows a night and five or six shows a night on the weekends, that instead of having different bands set up between acts, there was a house band. We read from charts and we only had a couple of days to learn the material. There was a different show every week. I really learned a lot about music there, a lot about interpretation of pop charts. Up until then I'd been classically trained,

and with classical music your interpretation is minimal. You add a personal feel to classical music, but you basically play just what's on the paper. With popular music, however, your feel is everything. They write out the charts, but they are hiring your powers of interpretation. It gives you a lot of room.

**MR&M:** At some point you also had a gig with the house band on the *Sesame Street* television show.

**NR:** I worked with *Sesame Street* for some time. The star of the show, Loretta Long, was married to the manager of the Apollo and they loved the way I played. I was only 17, but I was a very good reader, which is exceptional for guitar players, who are notoriously bad at that. I didn't really fit in politically, physically or socially, but they really liked me.

**MR&M:** At some point you played with an African juju hi-life band?

**NR:** With a couple. The main guy I played with was a Nigerian prince, Tony Bassman. He was an exceptional guitarist, and like many of those guys, he was really into learning jazz. If I played a James Brown lick, they considered it jazz and wanted me to show it to them.

**MR&M:** How did you rise out of the swamp of hard rock and busy jazz to come up with the reductionist sound that characterizes Chic?

**NR:** When disco was really popular, everybody tried to make a disco record and still retain their own style. They added this disco "feel" by doing exactly what they had already been doing and having the drummer go *ta-shh ta-shh ta-shh* and the bass player go *dum-dum-dum-dum-dum-dum-dum-dum*. Everybody was able to get a hit. So I did some arrange-



(l. to r.): Peter Gabriel, Adrian Belew, Rob Sabino (Chic keyboardist), Nile Rodgers.

ments of serious jazz songs by Gershwin and Benny Goodman with the disco "feel." We could have lots of fun, solo, keep playing jazz and still be commercial. All of a sudden, though, I felt really bad in my heart because I felt I wasn't being true to this new art form. I didn't think it was proper to rip off disco. I thought there was something dreadfully wrong with us laughing at this type of music and figuring out that all we had to do to a song was put this slick beat to it and we'd have a hit record. So I went home and wrote a song called "Everybody Dance." It was simple, with real cool jazz chord changes. I called up my friend Bernard Edwards, who I was in a band with—I think it was called Allah and the Knife Wielding Punks—and I asked him to write a bass line to it. I sang a really simple hook (sings): "Everybody dance, clap your hands..." We liked it and we were really proud that we created something new. We had a new drum pattern that was still danceable and ended up with what we felt was an original sound for dance music. Soon Bernard, Tony Thompson (Chic drummer) and I had an album of this new music ready, but no company. Eventually we came to the attention of the president of Atlantic Records, who thought it was the freshest thing he had heard in a while, and he signed us.

**MR&M:** With your music, it seems that the spaces between the notes are just as important as the notes.

**NR:** Absolutely. When I used to study, my teacher would say that silence is a very important part of music. A rest is just as important as a written note. Rhythm is the most important part of music. It's much more important than harmony or melody. You can make a song with one note and rhythm.

**MR&M:** Are you aware of the extent to which you've influenced modern music with your reworking of rhythm?

**NR:** I can see it more as I get out and meet people and they tell me. But our resources are quite limited. We have only a few notes to choose from, and it's amazing how many similarities of style there are, especially because when people are about the same age, they learn from the same people.

**MR&M:** You're very positive about this. How do you feel about acts such as Queen, which took your bass line from "Good Times" and used it note for note in "Another One Bites The Dust?"

**NR:** We knew about that because Queen's bass player was right in the studio with us when we were recording. Music is there for us all to learn from; you can't really own ideas.

**MR&M:** Let's talk about your guitar sound for a while. It's so bright and clean; sometimes it sounds like a bass being slapped. Do you have a special production technique for this sound?

**NR:** No, it's just the way I play. My right hand hits the guitar very hard and that's where the brightness comes from. You're getting the sound of the pick actually hitting the strings, not just the sound of the strings vibrating. I rest my hand on the bridge or I'm right over the pickups. I'm making noise with the pick. It can be brittle and harsh or it can be pretty. When your basic sound is that harsh you can always soften it up. If you don't have that strength in the right hand, your control over dynamics is limited.

**MR&M:** What amps and effects do you use with your guitar when you record?

**NR:** I go direct into the board. I can't even remember the last time I used an amp. I control all the level changes when I'm playing by the amount of force I use. When I was playing in nightclubs I didn't have effects. When that song "Shaft" by Isaac Hayes came out, the thing that made it unique was the wah-wah pedal. One night when I was subbing these guys asked me if I knew that song and I started playing it for them. They thought I was crazy because I could play it without a wah-wah pedal. I'm really into straight, clean guitar because it's so musical in and of itself if you play it with love. You can do all kinds of things using tricks. Don't get me wrong, tricks are cool; I love all that stuff.

**MR&M:** Do you have some stock guitars you use for recording?

**NR:** I'm really into an old fashioned Stratocaster sound. My favorite guitars are a very old Strat that has been on almost every record I've ever played on, and recently I've gotten into these Tokai Japanese guitars which are copies of old Strats. They sound amazing, so brittle and bright. I used them with Bowie and on everything I do now. I'm sorry to say that the Strat has taken a back seat.

**MR&M:** What studios do you like to work at?

**If I knew drummers who could do what drum machines do, I'd hire them.**



**I still know lots of guitar players that play amazingly well, and that's the group I want to be considered part of, the real musicians.**

**NR:** The only studio I've ever used for the past seven years is the Power Station in New York City. I've worked at lots of other studios, usually on someone else's record, but the Power Station has always been my home base. They have a lot of stuff that other studios have, an SSL, EMT plate echoes and all. But the thing I really like is their live echo chamber. Nothing sounds like that. Their rooms sound terrific, the maintenance is great and it's always working. My ears can depend on the way a room sounds there. When I make a mix I know exactly what it's going to sound like. I'm not gifted where I can judge the acoustics of any room and tell what parameters will be different.

**MR&M:** Do you have a home studio?

**NR:** I'll be honest with you, I've got lots of equipment, but my favorite thing in the entire world right now is the cheap little Fostex X15 with the batteries. I take it everywhere I go and make songs on the spot. It has forced me to get back to the old way I made records, which is to get all of my sounds right and balanced out when I'm putting them on tape. When I'm using discipline like that, it's amazing how good it can be. You can get spoiled by having equipment that is so good you just have to get the music on tape and worry about balancing it out later. With the Fostex I use no EQ; everything is flat. For vocals, I use Sennheiser 421s. They're really great all-around mics. When I'm in the studio I'll go out and rent 421s for the toms if they don't have them. At home I have a very ancient Neumann U47 that I sometimes use for vocals.

**MR&M:** How have you embraced or avoided quantum leaps in technology with the other home equipment you have?

**NR:** Since I've just spent thousands of dollars digitizing myself I can't say I've avoided it. I'm a total digital freak. I own everything Sony makes. At home I have a 3324 digital multi-track. I have the PCM 1610. Now, for the first time in my life I can sound

exactly like I do at home. I used to record a guitar part three or four times and I'd lose something. Now, what I record at home can be on the actual record. While I was writing it, it felt right, and I was involved with the emotion of that time. I don't have to worry about re-creating that. I love having the choice of being able to keep my original ideas. I believe in digital also because I believe it's very important for a musician to keep his/her sound consistent from situation to situation and historically. I think it's great to know that when I go in there to record today, no matter how many times I bounce it or change it around, in the year 2050 it's going to sound like we just turned on the machine today and put it on tape. A lot of people argue that the noise analog tape adds is part of the music. That's fine for them, but all I want to hear is what I play. I'm so crazy that I'm having the people at New England Digital build me an interface that goes direct from my synthesizers to my tape machines so there's no analog stage at all. I live with different signal processors, Publisons, AMS. Having the Synclavier has done a lot for me. The true-to-life sampling changed my life. I did that Duran Duran record "Reflex" and the whole song changed because of that instrument. Peter Gabriel turned me on to the Quantec Room Simulator, which I adore.

**MR&M:** Can technology get out of hand?

**NR:** Everything can get out of hand. It's what we make of it. I haven't seen too much technology yet. I adore the space program...

**MR&M:** What do you think about drum machines?

**NR:** I think they're the greatest thing in the world. If I knew drummers who could do what drum machines do, I'd hire them.

**MR&M:** Can technology make people take talent for granted? You know, just push the button and you've got the rhythm, another one for chords...

**NR:** Maybe. But I've just come

from England and I saw a lot of live shows. At the ones that were over-technical, with tapes and synthesizers, people were very ho-hum, but when a person came onstage and sang a song or really played, people were just freaking out. We need as much stimulation as possible, and I don't care where it comes from. If somebody invents a machine that can make me think of better guitar parts, fine. I'll buy it first. I'm not worried about a machine putting me out of a job. The machines can be shortcuts to composition, and the easier it is to compose, the more you can be creative.

**MR&M:** Let's talk about your solo album, *Adventures In The Land Of The Good Groove*.

**NR:** I was very nervous because I still felt responsible to Chic and couldn't get too crazy.

**MR&M:** But there was a heavy censorship issue that concerned one song, "Yum Yum." You weren't exactly being conservative with "slept all night with my hand on it, gimme some of that yum yum before I sleep tonight."

**NR:** When I wrote that, I intended it to be a very simple, funny thing. Unfortunately, a lot of people are very narrow-minded and didn't see it as my commentary on the fact that so many records go ridiculously overboard with sex.

**MR&M:** How did you hook up with Diana Ross to produce *diana*?

**NR:** Diana came to see Chic perform and she was impressed by the honesty and energy of our performance. She said that was what was missing in her music, and that's why she'd like to do something with us. It was a very emotional and easy process.

**MR&M:** What about Debbie Harry's solo album, *Koo-Koo*?

**NR:** Debbie and I had been friends for a while, and since we were both into the same music, we decided to do an album together. We had a lot of problems with the record. The cover (which shows a close-up of Harry's face seemingly skewered by spikes) was the biggest problem. We couldn't get any coverage. Musically, there were four personalities who were equally as strong. Any one of us could have done that record by himself. It was like having a basketball team with all power forwards.

**MR&M:** How did you come to produce *Let's Dance*, David Bowie's last album?

**NR:** David was another natural accident. I met him at a club one



Chic (l. to r.): Tony Thompson, Alfa Anderson, Bernard Edwards, Luci Martin, Nile Rodgers

night and told him about how Carlos Alomar was always one step ahead of me in my career. He was at the Apollo before me, he was with *Sesame Street* before me, and of course he played with David, which is something I always wanted to do. Maybe he remembered the story, or something. I really don't know why he called me. David is a very enigmatic person. But I'm really glad he did call me; it worked out great. It was a real meeting of minds. It was the fastest, easiest record I've ever done in my life because we were on the perfect wavelength together.

**MR&M:** As a producer, you often seem to be a collaborator or arranger as well.

**NR:** I'm not an engineer-producer, I'm a musician-producer. People hire me for the musical parts I can add while I produce.

**MR&M:** You are producing Mick Jagger's solo album. Will it reflect a change of musical direction for him?

**NR:** I can't say it's a new direction because maybe he was into it all along. You know, the Stones are the Stones, but Jagger is Jagger. It's not like Weather Report or something like that, but it's not going to have

***I didn't think it was proper to rip off disco. I thought there was something dreadfully wrong with us laughing at this type of music and figuring out that all we had to do to a song was put this slick beat to it and we'd have a hit record.***

that ultra-raunch edge that the Stones are famous for, either.

**MR&M:** You once said that if *Let's Dance* was a black record, it never would have entered the charts with as high a position as it did.

**NR:** It probably wouldn't have.

**MR&M:** Do you think radio crossover between black and white artists and formats has progressed since then?

**NR:** It's changing a lot. I think everything is going to be fine. Prince and Michael Jackson are doing incredibly well. But it's interesting that in America, if it's a black record it's not called "pop"; maybe we'll start to change our definition to "pop" meaning popular, not just white.

**MR&M:** People on the street might do that, but it may take a while for radio stations to catch up.

**NR:** If the music continues the way it's been going, they're going to have to catch up to it or those stations are going to fail.

**MR&M:** You seem to be at the forefront of a new crossover trend for black producers.

**NR:** I've been one of the luckier ones because Chic did so well pop-wise that when I started producing white traditional artists it wasn't really heavy. When I did David Bowie, it was probably one of the first times that a black producer was able to do a rock 'n' roll superstar, except for the early Dylan records. It seems really odd that there haven't been more black producers in a country where the music comes from the same source.

**MR&M:** What projects loom in your immediate future?

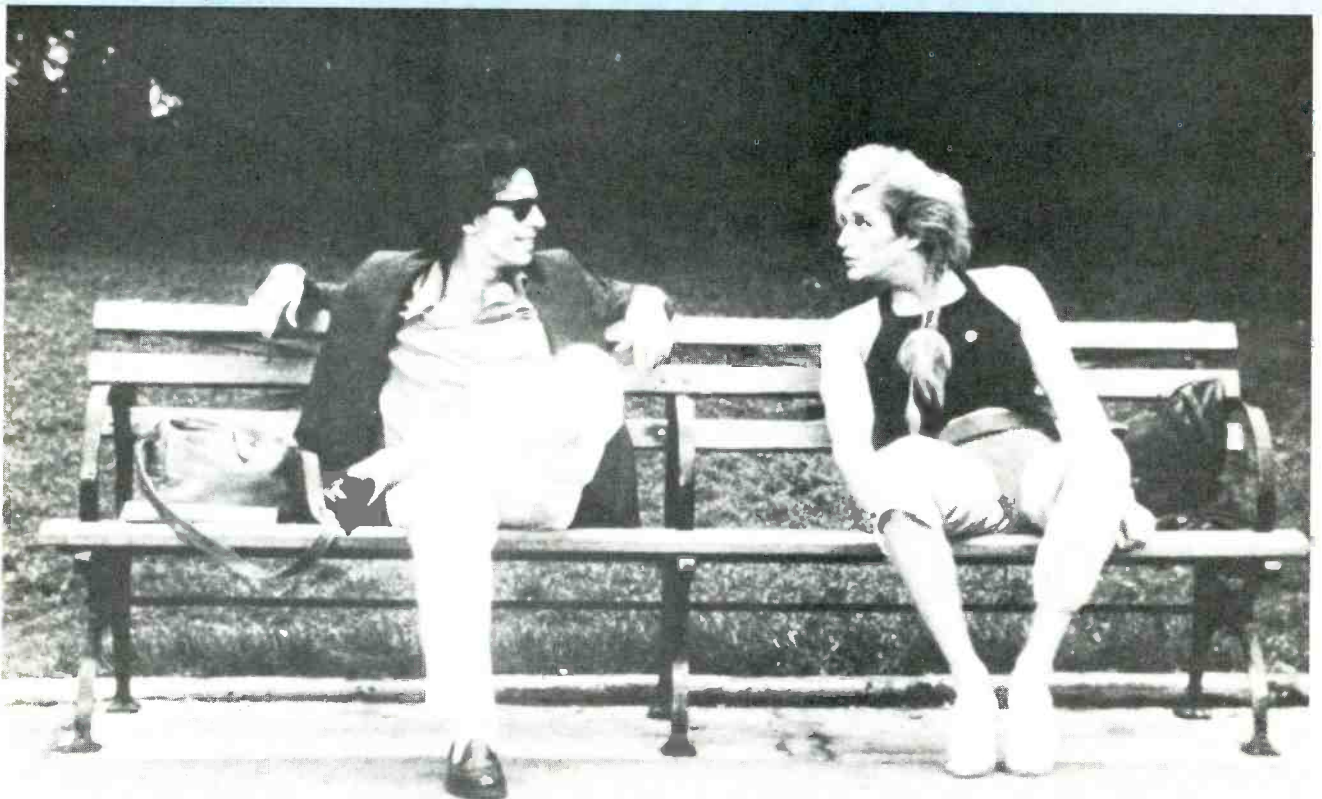
**NR:** I'm working on my album, Mick Jagger's solo album, and Sister Sledge. I really like working with women. All of the big hits I've written in my life have been performed by female artists. When I write as a man it's heavy and critical, but when I write songs through a woman's eye I can make fun of myself and all the other guys I know.



Larry Jaffee

# EBN — OZN

## COMPUTER GAMES



**W**hat happens when a computer music whiz who's been tinkering with recording studios ever since he was three meets a Broadway actor who sang with the Metropolitan Opera at 10 and now shares an equal passion for Gilbert & Sullivan and rap music?

You get EBN-OZN, a funk duo conceived for the video age. Their mini soap-opera single, "AEIOU Sometimes Y," garnered much crossover airplay last year on rock, pop and black radio stations, as did the self-produced video of the same song. They proved that it was no one-shot wonder with the infectious followup rocker, "Bag Lady," released earlier this year along with the debut album, *Feeling Cavalier* (Elektra).

At first glance, their partnership seems as unusual as the name (a combination derived from their given surnames, which they prefer not to divulge). EBN evokes a somewhat shy, brainy bookwormish-type totally immersed in the infinite possibilities of his computer music creations. OZN's classic blond rock star looks and clear, full voice emit a cocky, outgoing persona who's perpetually feeling, well, cavalier. Yet they meet on common ground as lovers of rock 'n' roll, and both grew up in the 1960s on the funkified New York City streets.

Several years ago they were introduced by an astute mutual musician friend who recognized the enormous potential if the two combined their seemingly disparate styles. Each was ecstatic about the rock video explosion and had his own ideas about music visuals.

At the outset, the dynamic duo decided to make their partnership as democratic as possible by capitalizing on each individual's talents and background. Multi-instrumentalist EBN takes credit for producing the recordings, while vocalist OZN is credited as producer of the videos. Both share secondary co-producer titles on the other's specialty.

Former Juilliard student OZN regularly sang opera classics by Verdi, Schumann, Schubert and Puccini as a teenager. Several years later he pursued theatre, appearing in the Broadway productions *A Funny Thing Happened On The Way To The Forum*, *Shenandoah*, and *Marlowe*, and co-starring in the road show of *The Pirates Of Penzance*. His acting in their two videos has sparked more offers for plays and films, OZN estimates, in the past year than he received in the last four years before that.

"Rock video is the one area in which I get to write music, screenplays and act—everything I can do in one medium," relays OZN, whose creative adeptness at producing videos is a story all of its own.

In this article, *Modern Recording & Music* concentrates on EBN's forays into computer music. EBN has created one of the first pop albums to feature almost entirely digital technology and playing. With the exception of a few odd overdubs and vocals, *Feeling Cavalier* was performed without the use of actual instruments.

Since EBN was very young he

fiddled with wires, slightly predating his interest in playing guitar and rock 'n' roll. By the time he was 16 he owned his own 4-track studio in Greenwich Village that was frequented by Jimi Hendrix. Three years later, he opened Sundragon, a 24-track state-of-the-art studio that has been used over the years by such luminaries as Brian Eno, Talking Heads, Ravi Shankar, David Johansen, and the Ramones.



Supplementing his recording studio business, EBN formed a hard rock band in the late '70s called Riff Raff, which recorded two unsuccessful albums for Island and Atlantic. Undaunted by this bad experience, he saw the EBN-OZN partnership fulfilling his wildest sound dreams.

To further his experimentations with technotoys like guitar synthesizers and a Fairlight CMI, EBN sold Sundragon and built a personal recording studio in his homey Soho loft, where the following interview took place.

**Modern Recording & Music:** Can you explain the concept behind computer music?

**EBN:** My Fairlight CMI (Computer Musical Instrument) enables me to create and sample sounds from real life and use those sounds as music by writing parts. Musically, this translates to creating events using those sounds. In other words, I can create the sound of a guitar, bass, drums, voice, or even sounds like a toilet bowl without actually playing those instruments or making those actual sounds.

**MR&M:** So you really don't have to be a musician?

**EBN:** When doing a song this way you should have a basic understanding about the instruments you're working with, at least on a general level. I play drums, guitar, bass and a little keyboards, so it has helped me a lot in realizing my ideas using a computer by having the part in my head and knowing what will work. Translating directly into the computer saves a lot of time.

**MR&M:** You didn't pick up an instrument or sit at the drums during the making of *Feeling Cavalier*?

**EBN:** Well, on the album I did play real bass and quite a bit of real guitar because it sounds more natural to play analog and I don't like to program most of that stuff.

**MR&M:** How do you develop and compose a song?

**EBN:** Usually I start with the rhythm section and score different parts—bar by bar. While I write and score the parts I can store and edit them in the computer. Individually, I go through each part and arrange them into the song using the digital technology.

**MR&M:** Say you woke up with a riff in your head. What would you do first?

**EBN:** I would do a quick rough drum pattern to get a rhythm happening. Then I'd put the riff out of my brain and into the computer's memory and work a bassline around it. Then I'd start listening and see which way it goes. Using the computer is like having a big, endless scratchpad that you can erase, save, update. It's a constant evolution to come up with a finished track.

**MR&M:** Can you describe how you mesh the channels and sounds?

**EBN:** As I build the rhythm pattern I put a sync-tone on the tape which locks the machine into a certain tempo. I can dump eight channels at a time with the Fairlight. So I do the first layer of 8-channel rhythm and then a second layer of chords and melodies. Then I dump it to the 24-channel. Sometimes I do it in three layers. Often I'll group things together, combine notes into 4/4 four-note chords into one track. So in actual fact, it winds up being 24 channels from three layers created by the computer.

**MR&M:** Having your own studio must have really helped you explore this way of creating music?

**EBN:** That's right, you can't do computer music in a traditional recording studio, unless you're Fleet-



**Using the computer is like having a big, endless scratchpad that you can erase, save, update. It's a constant evolution to come up with a finished track.**

wood Mac. Then you can do it, but it'll take \$800,000. To do this kind of music, you need some place to experiment. You can't just go into the Power Station and do computer music on a normal budget. Besides, most studios aren't equipped for it, anyway.

**MR&M:** Can you describe your studio?

**EBN:** It's called MSP, which stands for Maximum Sequential Potential. It's located in my home and is entirely dedicated to electronic music, perfect for any kind of synthesizer stuff. After I go crazy with the electronics in my private production facility and finish the basic tracks, we mix them at an outside studio because MSP doesn't have that kind of capability.

**MR&M:** What kind of equipment do you have?

**EBN:** The heart of the studio is the Fairlight CMI, which includes a computer terminal and keyboard. The display terminal has the capability of creating graphics, which we've used in the videos. Then I have a Lexicon 224 Digital Reverb, a bunch of Studer two-tracks, a Marshall Harmonizer and Time Modulator, and a lot of outboard stuff for signal processing. Some of the stuff is custom built especially for me. Most of it is pretty basic for computer music. Also I use an Oberheim synthesizer and expanded modular system, which is as antiquated as synthesizers go in terms of ease of operation. But to me, it's like one of my old Les Paul '58 Gold Top Specials. It has a big, ballsy and fat sound. There's also a grand piano.

**MR&M:** How long did the first album take to record?

**EBN:** In real time, it was a four-month project constantly spent in the studio.

**MR&M:** Was your fascination for computer music completely fulfilled with *Feeling Cavalier*?

**EBN:** I feel confident and good about what we accomplished with

this first album. My aim was to go heavy with the software and make something dance/pop using minimal live playing and to maximize programming of different and simple sounds using the computer.

**MR&M:** During the making of the album did you constantly incorporate "new toys" that you were adding to the studio?

**EBN:** There were a couple of tidbits like a Marshall time modulator, and a synthbox vocoder that I picked up from Bob Moog. You can hear it on "Rockin' Robin" and "Stop Stop Give It Up." A lot of my digital stuff was helped by playing the Oberheim synthesizer analog. The computer controls and drives all of the channels so I have the best of both worlds. That way I can layer individual sounds or whatever I want. For example, I'd program a lot of the analog stuff, add colors, and stretch out with the capabilities of the digital stuff. Also, my Avatar guitar synthesizer, which was the first ever made, enables me to do a lot of coloring. I can use it as an instrument, or run the massive library of sounds—thousands and thousands of them—through the guitar.

**MR&M:** Were there any breakthrough techniques on the first album that really had not been done before?

**EBN:** It certainly is one of the first pop albums to use such extensive computer technology in complete band tracks. There are certain tracks—"Kuchenga Pamoja" is a classic example—on which every sound with the exception of a 24-bar guitar solo in the middle is computer-generated. Most people would use a drum machine. But here we're talking everything—drums, bass, percussion, all the strange sounds like pygmies chanting and Tibetan monks—were created by the digital machines.

**MR&M:** How did "AEIOU Sometimes Y" evolve?

**EBN:** That started with a bassline and expanded like a mushroom. The computer created all of the sounds. All of the breathing is in time using the program power of the computer, synced up exactly on the beats. OZN wrote the two verses and all of the raps after the instrumental track was pretty much down. The vocals and everything else were filled in around the hooks and drums.

**MR&M:** How far have you gotten on the second album?

**EBN:** It's in a rough stage. We have lots of ideas, bits and pieces stored in magnetic discs, floppy discs, tapes, everything.

**MR&M:** Have you had any problems translating all of this into a live act?

**EBN:** No, we do it with a combination of live playing by three other musicians and computer playback. Special percussion effects that would be impossible to play, like the toilet bowl flushing on "I Want Cash," can be retrieved live from the computer. Things like that really add something zany and fun to the live act.

**MR&M:** Do you have any plans to rent out MSP to other musicians the way you did with Sundragon?

**It takes a commitment to learn how to use the machines. You have to really experiment and not be afraid to make mistakes. It's a constant process of learning. Some musicians might get intimidated... it's all up to the talents of the individual running it.**



**EBN:** No, the old studio was a business—a working taxi meter. It helped fund my insane addiction for these things. But I have no intention to turn MSP into a business again. When people use my facility now, they're using my talents and knowledge in a certain area, as opposed to just the hardware. That's a big difference. Phil Ramone and Arif Mardin are two producers who I have worked for as a consultant in the last year.

**MR&M:** How many other people are doing computer music?

**EBN:** Thomas Dolby, Stevie Wonder and Geoff Downes each have a Fairlight CMI. Some people use it as a conventional synthesizer and just play the keyboard. A lot of people haven't had the time to get into it yet. It takes a commitment to learn how to use the machines. You have to really put yourself into it and experiment and not be afraid to make mistakes. It's a constant process of learning. Some musicians might get intimidated. But I think more and more are looking for an avenue to supplement what they're doing, though not to take the place of it. Slowly, studios are getting into computer music, but not many, because they don't have the operators who know how to use the machines. It's the musician behind it, not really the machine. It's all up to the talents of the individual running it.

**MR&M:** Is it true that you developed a friendship with Jimi Hendrix?

**EBN:** When I was 16 years old I mixed a gig for him. He lived right

around the corner from a 4-track recording studio I had. A good friend of mine was his prodigy; that's how I got to know him. In fact, I saw him record "Crosstown Traffic" at the Record Plant; they were great sessions. One night I wound up mixing for Jimi at the Salvation Club. It was the first night he had broken up the Experience and came with his Band of Gypsies. It was a strange gig because the management was not happy about the change at all. They wanted him to stay in the crossover white market. A lot of weird things were going on that night. Actual wires and cables were cut. There was a lot of tension and sabotage happening. It was a tough gig, but he was a pleasure to work with. I never worked with someone that brilliant. He was a very nice and humble man.

**MR&M:** What kind of music do

you think he would be making today with the technology available if he was alive?

**EBN:** Jimi would be doing way out stuff, boy. Crazy electronic stuff—synthesizer and guitars. I know he would be in the forefront. He was so talented.

**MR&M:** You worked with conventional rock bands as a musician in a group. Compared to that, do you find computer music a little lonely?

**EBN:** Doing music like this for the last couple of years has shown me what it's like to be a writer. You're really alone when you do this stuff, really inside yourself. It's very introspective, which is good and difficult in a lot of ways. But yes, it's definitely a lot of man-hours spent in here alone. For *Feeling Cavalier*, we're talking hundreds of hours. It was five full days just for the programming. Just a man and his machines.



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HE'S A  
NATURAL**

**T**o the vast majority of American record buyers, Randy Newman will always be remembered as "the guy who wrote that controversial song about midgets." That's the price he's had to pay for the huge success he scored with "Short People," a tongue-in-cheek poke at bigotry that was widely misinterpreted as a nasty slur against diminutive folk.

Die-hard Newmanites, of course, understand their man. They take his wry wit with a grain of salt. They understand that when Newman suggests that we ought to "drop the big one and see what happens" in *Sail Away's* "Political Science," puts forward the view that homosexuality is contagious in *Born Again's* "Half A Man," or points out that "short people got no reason to live" in *Little Criminals's* "Short People," that the composer is not giving personal testimony. Since the vast majority

of his songs are sung by "narrators" who rarely share the viewpoint of their creator, Randy Newman may in fact be one of the most misunderstood songwriters in the annals of American music.

Newman's influences range from the popular classics of Stephen Foster, Cole Porter and Hoagy Carmichael to R&B greats like Fats Domino, Chuck Berry and Ray Charles, mixed in with classical composers like Aaron Copeland, Beethoven, and Verdi. And his dry, biting wit recalls such great American humorists as Mark Twain, Will Rogers and W. C. Fields. He's a complex, multi-faceted man, and to suggest that "Short People" is what Randy Newman is all about is a grave injustice.

With the recent release of *The Natural*, a summer box office smash starring Robert Redford, perhaps more people will begin to realize the full scope of Newman's talents. That film, based on the Bernard Malamud novel about an aging baseball player attempting to make a comeback into the major leagues after a fateful accident, is actually the fourth film that Randy Newman has worked on. In 1970 he composed the blistering "Gone Dead Train" for Nicholas Roeg's *Performance*, which starred Mick Jagger. That same year he scored Norman Lear's *Cold Turkey*, starring Dick Van Dyke, though no album was ever released.

Newman's first triumph in the realm of scoring came in 1981 with his wonderful work on Milos Forman's *Ragtime*, based on the E. L. Doctorow novel. Newman's extensive research into 1900-era balladry and popular song forms helped him produce a score that is superbly integrated with the film. It also garnered him an Oscar nomination and the Los Angeles Film Critics Award for best score.

And now Newman has further increased his stock as a film scorer with his impressive work on *The Natural*, which he feels is his best to date.

In spite of his recent successes with scoring, Newman isn't about to put his pop songwriting career on the back shelf. The two are extremely different disciplines, he points out, and he enjoys the variety. And besides, there will always be plenty of things around to bug Newman and spur him into some kind of cantankerous commentary.

*Modern Recording & Music* spoke

with Randy Newman in his Manhattan hotel room, just prior to an appearance on *The David Letterman Show*. Normally a shy person, he seemed unusually eager and enthusiastic to talk about his work on *The Natural*.

**Modern Recording & Music:** What was your working relationship with director Barry Levinson?

**Randy Newman:** Close. We were in the same building. I did the writing at an office in Venice, California, where they were working on the picture, and I did the recording at MGM. I'd write everyday. I'd play something on the piano, Barry would be strolling by, he'd hear it, come in and listen. But he didn't tell me what to write. After I'd do a piece, he'd make some comments, some suggestions. We talked a little bit. We'd disagree about some things. He won some and I won some. It was a compromise.

**MR&M:** What were some of your biggest challenges in this film?

**RN:** What scared me the most was the final scene. I don't know if I can talk about it 'cause I don't want to give away the plot, but his final at bat is three and a half minutes of nothing, then the lightning comes; he breaks his bat. Basically, it was difficult to play off of Redford and this final scene is entirely him at bat. You could start cues off the reactions on the girls' faces, but it was a lot harder with him. You know, he's not very demonstrative. The character he played and tends to play is not a musical character, you know what I mean? It's not emotional. And a lot of times there would be a shot of him and it would feel like the whole thing would stop dead.

**MR&M:** He struck me as a Gary Cooper figure in this film.

**RN:** Very much so. It's an unmusical character to deal with, which only made my job harder. Music is supposed to move you and he's a fairly stoic character. Kim

Basinger and Glenn Close were a lot easier to deal with. Redford was alright with the farm scenes, where you pull out the woodwinds and do the Copeland Americana stuff. But his more neutral, held-in, manly kind of stuff made it much harder for me to work with.

**MR&M:** Was there much trial-and-error involved in this film?

**RN:** No. Once I had the musical ideas sketched out, we did it. I did change some things on stage where I needed more weight, where I may have misgauged how much noise something would make. That's where Jack Hayes (the film's orchestrator) came in. He helped immensely on things like where I may have scored for an oboe and he knew that it was really too low for an oboe, that an English horn would do better. I enjoyed very much that aspect of talking to Jack about music. And I learned a lot from him.

**MR&M:** Tell me about some of the disagreements you had with Barry.

**RN:** There's a scene where the team goes bad, and Barry wanted to play against it. He wanted to go like a ballad, which I didn't want to do. But I did it. And it worked alright. I mean, he was sort of right, I think. But I would've done it differently, I believe. I won more than I lost. It's tough. Barry's not a musician but he's a good director and he made a lot of good choices about other things in the picture that I wouldn't have thought would work. And they did.

**MR&M:** Like the ending?

**RN:** Oh, you mean in terms of the book? He had to do that. Have you read the book lately? To criticize the movie on the basis of the book is absolutely ludicrous. I mean, the book ends with a strikeout, the good girl gets hit with a foul ball, he over-eats like Babe Ruth did. The book is nasty. It would've been suicidal to make a movie the way the book was. The book is good and Malamud is a good writer. But the book is not cine-

**So many people are saying, "Well, gee, the picture's great!" And I keep waiting to hear someone say, "The music was wonderful!" It's a lot different than making an album. You're not the head guy.**



matic, without drastic changes. There's just no way. It would've been suicidal. And now, instead, they have a hit picture.

**MR&M:** Did you have any problems with how the film, and specifically your music, came out?

**RN:** Well, I thought it could've been louder at times. Everytime we had disagreements it was about level, and I always liked it louder than they had it. I think musicians always have that trouble. Well, for instance, I don't like the scene where the bad girl comes in the hotel room and takes her fur coat off and she's naked. There's no reason why that music couldn't have been louder in there because there was nothing else going on, really. But it wasn't my choice, and that's hard getting used to. It's a subsidiary job. You're like a servant to the picture, and that's hard for me to get used to. So many people are saying, "Well, gee, the picture's great!" And I keep waiting to hear someone say, "The music was wonderful!" It's a lot different than making an album. You're not the head guy.

**MR&M:** Were you involved in the mixing process?

**RN:** Oh yeah, very much...fighting the whole way. But they listened to me too. Very much so. But you win some, you lose some. There was one scene in the clubhouse after Pop finished shaving and he came back and talked to one of the coaches about how his father wanted him to be a baseball player. Anyway, I worked up some music for that scene to play behind Pop's little speech, and Redford didn't want it. But I did want it. I think it worked and I still do. But he took it out. It was only about 20 seconds of music...so I lost that one. And I'm not used to losing at all 'cause I make records and do whatever I want.

**MR&M:** So, do you enjoy the process, in spite of these frustrations?

**RN:** Yeah, it's worth it for getting on the stage with the musicians. There are terrible mornings where you go in and you have two minutes ahead of you and you just don't know what to do. And everybody has these days—John Williams, Jerry Goldsmith, the best of 'em. It happens all the time. You just don't think you can do it. What are you gonna do? Some guy running around the bases...what does that suggest to you? And then it cuts to these drastic changes in mood. How are you gonna make it? And there are some bad days when



Photo by Debbie Leavitt

you have a deadline ahead of you. But then it's great when you solve those problems and it works, or you think it does. And the other thing I like about scoring is it's nice to collaborate once in a while...you know, not being the head guy. It's less pressure in that respect. It isn't like going out on stage and having people review you or doing an album and having some critic pan it. But it's a tough job and I think it's a dying art. There are fewer and fewer people left who do it well, because the directors and studios don't want it anymore. A lot of them want tie-ins with MTV and they're not thinking about what it does for their picture.

**MR&M:** I just saw *Taxi Driver* for the first time, with the Bernard Hermann score.

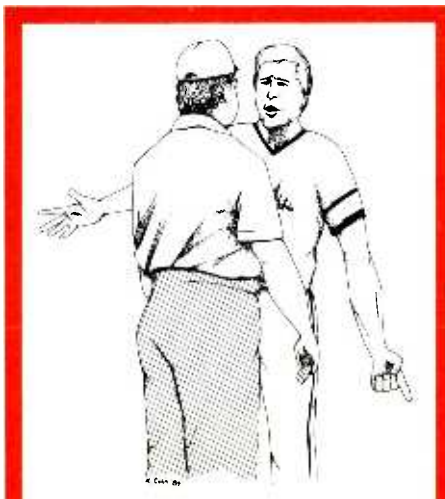
**RN:** Tremendous! All those horns. Another guy is Hugo Freidhofer. I just saw his work in *The Young Lions*. Boy, was that great! You know, you can make people look real clumsy on screen if you don't do the music right, but these guys had a way of making

people look real debonair and 40 feet tall and smooth. They're great.

**MR&M:** You used some synthesizers on this film.

**RN:** Yes. I don't love synthesizers, but I'm good at using them. I've used them on my last two albums, which I thought were the best pop albums I ever made. I guess I'm interested in synthesizers because I have to be. The way things have gone and the way time has gone, orchestras sound a little bit old fashioned now. So you have to keep abreast of all this technology. Of course, I'm never going to have the facility that Thomas Dolby has, but I can get the sounds that I want. I like the Fairlight for some things, although it didn't come in too handy for us on this picture. They do great bass sounds, great effects sounds, good high tinkling sounds, good bells, they can play a solo horn very well. But I'll tell you, they sound like they're coming out of a box to me. I just can't get over that fact. I like some of the straight synthesizer records...you know, some of the English bands. I like synthesized horn solos but they don't do sections that well. It just isn't the same thing, it isn't as big-sounding. And we tried. We did it every which way but it just didn't sound like a bunch of horns. It's not supposed to. But I wanted it to in this case. It's an old-fashioned picture and it's an old-fashioned score and I wanted to preserve that feeling. And I certainly wouldn't have used a Fairlight instead of a real string section. I like synthesizers alright, but I don't feel the same way about them as I do about an orchestra. I love an orchestra.

**MR&M:** What type of preparation did you do for this film in terms of



researching the music of the period?

RN: I listened to some records—Glenn Miller, Duke Ellington, Count Basie. It was supposed to be 1939. I prefer the music a little earlier, when they had the tuba and the banjo in the band. But this period was the beginning of the trumpet-oriented swing era. Clarinets started disappearing, the banjo was already gone, the tuba was gone. In general, the music started to get a little whiter. I prefer Fletcher Henderson and stuff like that, about 10 years earlier. I also looked at some scores I liked—“Appalachian Spring” by Beethoven, “Falstaff” by Verdi. What Verdi did with that is what I really can’t do: this unbelievably light, transparent stuff that I have a difficult time with. It’s my weakness in terms of orchestration. But I looked at his stuff and it was of some help. You know, real fast, light, amazing stuff.

MR&M: Did *The Natural* present more of a challenge to you than *Ragtime*?

RN: Yes, it did, because there was crucial dramatic stuff to do in this one. There’s more diversity and nuance, too. And *Ragtime*... God, he really cut me up, you know? They cut 38 minutes out of the picture after I did the music. Milos would take a chunk of music and use it here and there. I know I got nominated for an Oscar and all, but I wasn’t happy with what he did. Some scenes were good. The album of *Ragtime* was really good. And I think this one is too. I know it’s a better score.

MR&M: Any future projects upcoming?

RN: Maybe another album. I also have an idea for an Off-Broadway musical based on “Faust,” where Faust is a kid at Notre Dame and God and the devil are vying for his soul. But this Faust is a very bad kid. He’s kind of disinterested in the whole thing and doesn’t believe in making those kinds of deals anymore. So I’ll work on that. And I might do another picture. I enjoy working on pictures. A lot. It’s very hard work, but it’s a pleasure going in with an orchestra.

MR&M: At what point in the film’s production did you enter on this one?

RN: The end. It wasn’t entirely edited, though, and that made it a good deal more difficult. They kept changing things, and as they cut film it affected what I had already done. So I would have to revise and cut and change things. They could cut four-tenths of a second and it could be crucial to you. I’ve talked to people who have done hundreds of films and they say sometimes there will be a reel that isn’t quite set, so they’ll tell you to write loose. But this was cut many times... little fragments out here and there. And that makes your job a lot harder. Really. Ideally, the film should be completely done before my work begins.

MR&M: Talk about the process a little bit.

RN: I worked with a video of the film and with cue sheets. The music editor will make up sheets with cues and numbers... say, it’s reel number four and the fifth piece of music in that reel; that’ll be logged as M-4-5, which stands for Music-Reel 4, Piece 5. Let’s say it will be a minute and twenty seconds long... your starting

point is .00, at .12 Robert Redford picks up his bat, at .23 Redford goes to the plate. Some of this is not significant, some of it is very significant in terms of things to catch and play off of. So you’re working from both the video and from the cue sheets. As a matter of fact, you’re almost better off working just with the cue sheet rather than looking at the video all the time. You know where you are better with the cue sheet.

MR&M: So in many cases you would be isolating on individual movements?

RN: Sometimes. Sometimes a little move of the head will be of significance. Of course, you don’t want to overplay it with some real dramatic burst of music to accompany that slight movement. You just have to have the knack of choosing the right sound to fit that movement. And it works. It really enhances a film. And as I’ve done more of it (scoring) I’ve found that it’s easier to work off movements than off words. It’s the picture that counts. The turn of a door knob, the clink of some keys; it’s the little stuff. All the old masters at this game really understand this. It’s a subtle art.

MR&M: Who do you consider to be the masters at this craft?

RN: I think my uncle Alfred Newman was about the best, actually. He did *Song of Bernadette*, *How Green Was My Valley*, *The King And I*, *Wuthering Heights*, *How The West Was Won*, *Airport*. The first things he did were those old Eddie Cantor pictures like *Roman Scandals*. He also did pictures like *All About Eve*, *Alexander’s Ragtime Band*... lots of ‘em. Another of my uncles, Lionel, did the score for *Best Years Of Our Lives*. And my other uncle Emil was also a composer-conductor.

MR&M: So your interest in this process goes back to your childhood?

RN: Yeah, it was what I thought I’d do for a living, when I was a kid. When I was five, six years old I’d go on stage with my uncles and just watch. I remember seeing my uncle Alfred work on *All About Eve* at Fox Studios when I was six. I also watched him work on *The Greatest Story Ever Told* and *The Robe* when I was just a little kid. And I’d go see my uncle Lionel conduct.

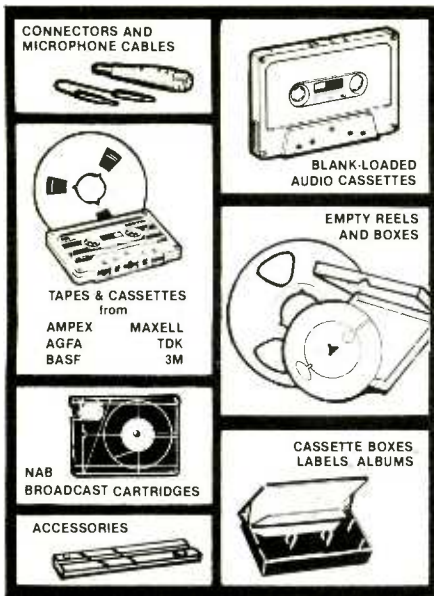
MR&M: So, it’s all in the family. Did you have any formal training?

RN: Yeah, I’ve done a fair amount of orchestration. I studied with Tedesco and Trombley. At UCLA I majored in music and I’ve always

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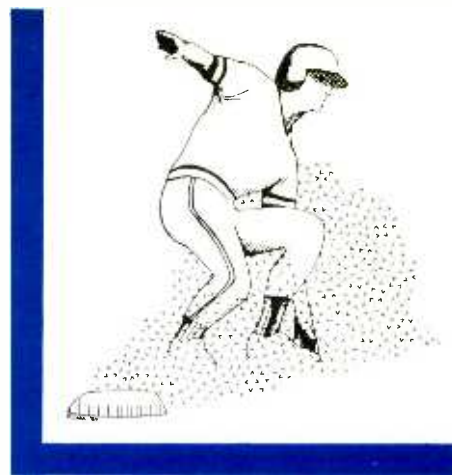
listened to a lot of classical music. But all that doesn't necessarily prepare you adequately to score a film. Until you do it, you don't realize some of the difficulties presented by it. It's the kind of job that is very demanding and time-consuming. It's nine-to-five, eight-to-four, everyday, or you don't finish.

**MR&M:** What was your job, then, with this film?

**RN:** What I thought I could do was warm up the romantic aspects of it. I thought it needed it. His (Redford's character, Roy Hobbs) relationship with the bad girl (Kim Basinger) and the good girl (Glenn Close) needed it. The action sequences certainly needed it. Without music they didn't work. They weren't designed to. You know...a guy runs around the bases for two minutes and nothing's happening. So the music was vital there. And it was also important to help establish the period, which they didn't really pay a great deal of attention to in the picture. You didn't always know it was 1939, so my music had to remind you of that at times. And the music helped to establish that mystical element, the fact that it wasn't quite real life. It was a little beyond, you know? I mean, he did things that no human has ever done: knocking the cover off the ball, smashing the clock with a home run, all these feats of epic proportion. It was like a Greek tragedy in a sense. Like Homer's *Iliad* and *Odyssey*. It wasn't literal. It wasn't real. That's what I thought of the movie on a philosophical level. But when you get down to working on it, you can't deal with the philosophical anymore.

**MR&M:** Did you assign particular chordal passages or musical motifs to each of the characters?

**RN:** Well, the stuff for Redford and that theme for his bat was mostly based on a fourth...kind of triadic to go along with the heroism of his character. But other than that it was a particular instrument more often than specific chordal passages: saxophones for the bad girl, clarinets for the good girl. It's amazing... things that you would think would be too obvious, like using a sax for the bad girl, actually worked. It's a subtle business in a way in that you don't want people to notice your music, necessarily, yet it still has to do the job. So in a way it's pretty simplistic. And it works. There are some things I didn't do that I might have done. For instance, there's a



scene at the party when he gets sick. The bad girl gives him something and he becomes ill and everybody in the movie house starts to hiss and boo at her. I had a cue there that ended with a flurry of electric flute, but I didn't want to land on it. And I didn't. But maybe I should've, now that I've seen the picture again. But at the time I thought it just would've been too much. I didn't want to do it. Now I'm not sure whether I should've or not. I didn't want it to be that cute, have it land on this nasty, evil-sounding theme for the bad girl.

**MR&M:** Borderline camp?

**RN:** Maybe. But they're really out there anyway with this picture. It's like *Superman* or *Star Wars* or something. It's the antithesis of what I do in my own work, but I didn't mind. Otherwise, I'd have never written any of this stuff on my own. So I was glad I had the opportunity to have a vehicle to do it, because I enjoy working with the big orchestra. I not only like an orchestra for the sound, I like the musicians. And if they compliment you and say that they like your music...that *thrills* me. And in this particular picture I was dealing with the big horns. It was hero music, and I liked that because I never write about heroes in my own music.



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# Lab Report

## Revox PR99 2-Track Recorder/Reproducer



**General Description:** The Revox PR99 is a rugged, yet precision-built tape deck designed for the needs of the broadcast studio or for demanding non-professional or semi-professional use. It employs a 3-motor direct drive tape transport system. Tape tension is switchable to match hub diameters of the reels. A hardened aluminum front plate is used for mounting the tape transport components and the amplifier electronics of the deck. The headblock assembly is mounted on the same plane as the operating controls. Among the many operating features and enhancements of this deck are edit and dump editing, synchronous operation (in the record mode, one channel can be switched to play back via the recording head), balanced inputs and outputs, externally accessible audio and bias adjustments, headphone monitoring which is adjustable in level, and level metering using two illuminated VU meters equipped with peak level-indicating LEDs.

A remote control attachment as well as balanced microphone inputs are available as options. Accessories supplied with the unit as standard equipment include the detachable power cord, an operating instructions manual, a set of circuit diagrams, a set of spare fuses, one connector each for remote capstan control, remote tape drive, fader start and monitor

receptacles, and, of course, an empty 10½-inch take-up reel. A block diagram of the PR99 electronics, signal flow, and switching facilities is reproduced in *Figure 1*.

**Control Layout:** The model of the PR99 that we tested is equipped with a tape counter that shows real-time indications for both its operating speeds. This counter, located below the supply reel, has several pushbuttons associated with it. A reset button resets the counter to zero. A "Transfer" button transfers current counter reading into the address memory of the system. Pressing the Z-LOC button automatically fast-winds the tape (in whatever direction is necessary) to a 00:00 counter reading. Pressing the button labeled "A-LOC" winds the tape automatically to any previously defined "Address." The Address refers to playing time (positive or negative) relative to a 00:00 counter reading. When the SET button is pressed, the address currently stored in memory will be displayed. Pressing the SEL (select) button changes the digits to be used in the SET mode. Digits are addressed from left to right. A button labeled STP (step) is used to increment the digit that is flashing. Finally, a RPT (repeat) button is used to continuously replay a pre-defined tape segment.

Channel select buttons for synchronized (SYNC)



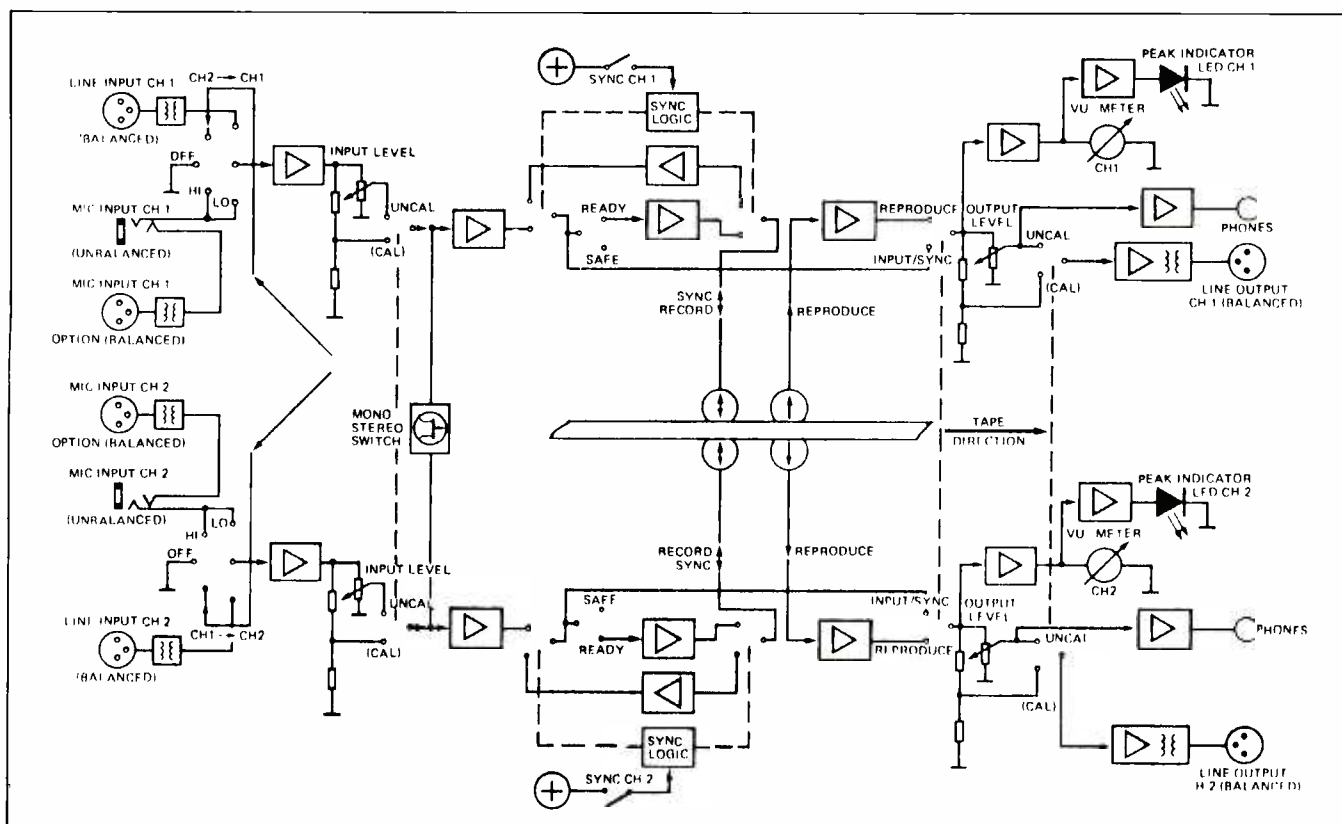


Figure 1. Block diagram of the Revox PR99.

playback are also located in the region below the left-hand supply reel, while a reel-size selector button and a TAPE DUMP button for dump editing are located in the corresponding location beneath the take-up reel. Tape speed selector buttons and the main power On/Off switch are located near the left end of the front panel, as are the Tape/Source monitor switch, the dual playback level controls (concentrically mounted), a mode selector switch, the headphone jack, and a changeover switch for output level (from CALIBRATED to ADJUSTABLE).

Positioned directly below the headblock assembly are input level controls for each channel, input selector switches for each channel, record indicator lamps, record preselector switches, unbalanced microphone input jacks, and an input level changeover switch (from CALIBRATED to ADJUSTABLE).

The two illuminated VU meters are located at the lower right of the front panel, and below them are the tape transport pushbutton switches. Included are buttons for PAUSE, FAST REWIND, FAST FORWARD, PLAY, STOP, and RECORD.

All connections to and from the PR99 are made via connectors located along the top surface of the unit. Here we find female 3-pin XLR connectors for Channel 1 and Channel 2 line inputs, as well as for the balanced MIC inputs, male XLR connectors for line outputs, and various DIN connectors for the remote control attachments and the monitoring cable. A line voltage selector and a fuse post are located at the rear of the deck, as is a connector for the separately supplied power line cord.

**Test Results:** Results of our laboratory measurements are tabulated in the VITAL STATISTICS chart

found at the end of this report. Tests were conducted for all of the relevant operating parameters listed, at both operating speeds. Record/Play frequency response at 15 ips was flat to beyond 20 kHz, both at 0 dB recording levels (250 nWb/m) and at -20 dB levels. Response was down only 2.2 dB at 24 kHz for the 0 record level tests and 2.0 dB at that same frequency for a -20 dB record level. At 7½ ips, response was down 1.5 dB at 24 kHz for a -20 dB record level but, as might be expected, tape saturation resulted in a roll-off at the 0 dB record level, so that response at 24 kHz was down some 8.7 dB at that high frequency, for 0 dB record level, using the slower tape speed. Results of our frequency response tests are shown in the graphic plots of *Figures 2A* and *2B*. Playback via the record head (in the SYNC mode) was also checked; response in this case (at -20 dB record level) extended out beyond 15 kHz for the -3 dB roll-off point.

*Figures 3A* and *3B* illustrate the amount of third-order harmonic distortion as a function of record level. At 0 dB (where the double vertical line is shown) third-order distortion measured only 0.07 percent at the 15 ips speed; 0.25 percent at 7½ ips. A full 13 dB of headroom above 0 dB record level was available at the 15 ips speed before the 3 percent distortion level was reached, and in the 7½ ips mode, 10 dB of headroom above 0 dB reference level was available for the same 3 percent level of third-order harmonic distortion.

A-weighted signal-to-noise referred to 0 dB record level measured 61.8 dB at 15 ips and 63.3 dB at 7½ ips (see *Figures 4A* and *4B*). To these figures must be added the available headroom before reaching the 3 percent saturation level, so that overall signal-to-noise figures are actually 74.8 dB for the 15 ips speed

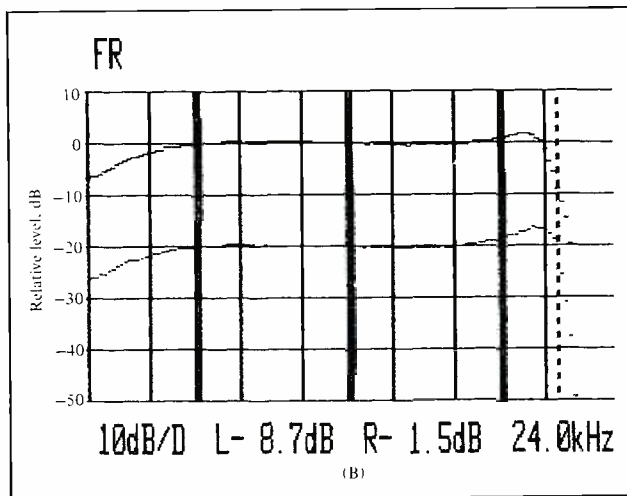
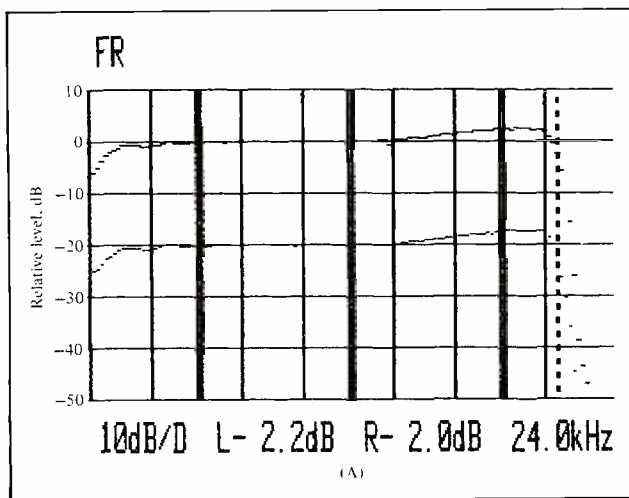


Figure 2. Record/Play frequency response at 0 dB and -20 dB record levels, measured at 15 ips (A) and at 7½ ips (B).

and 73.3 dB for the slower tape speed. Revox quotes S/N referred to 500 nWb/m, or a record level which is 6 dB above 0 dB on the meters. Based upon that reference, the signal-to-noise figures we measured were 67.8 dB at 15 ips and 69.3 dB at 7½ ips, both well above the 66 dB claimed by Revox in their spec sheet.

Figures 5A and 5B illustrate the output-vs.-input linearity of the recorder. In Figure 5A, a 315 Hz signal is recorded at steadily increasing amplitude. The 0 dB record level is represented by the double vertical line. At +10 dB, that signal is reproduced at a level of +10.1 dB. A second reading, this time at a frequency of 10 kHz, was made in the same way, and at +10 dB the output during playback measured +11.1 dB. The deviation, however, was not because of any non-linearity since, as you can see from the two curves, the 10 kHz output was consistently a bit higher than the mid-frequency playback level, even at lower recording levels. This was due to the slight peak in the response at 10 kHz using the tape sample that we chose (Scotch 250 as opposed to Scotch 206, for which the machine had been factory-calibrated). Figure 5B shows the results of the same tests made at a tape speed of 7½ ips. This time, linearity was good for the 315 Hz signal (output for a +10 dB input was

+8.4 dB—a deviation at +10 dB of only 1.6 dB). However, for a 10 kHz signal, tape saturation began to take its toll and, at +10 dB record level, output was only +4.5 dB. Bear in mind, however, that we are talking about +10 dB above 250 nWb/meter. At 0 dB, even at this slow speed, linearity was nearly perfect even at 10 kHz.

Wow-and-flutter measured a very low 0.011 percent (WRMS) at 15 ips, increasing to 0.031 percent at 7½ ips. Analysis of the wow and flutter content is shown in the graphs of Figures 6A (15 ips) and 6B (7½ ips). Input and output levels as well as other specified electrical and mechanical characteristics of the PR99 conformed perfectly with Revox's published specifications. Speed accuracy was better than 0.1 percent at both speeds. Fast rewind for a reel of 2,500 feet of tape took only one minute and 30 seconds.

**Comments:** To my way of thinking, there seems to be very little difference in performance between the PR99 (which is sold under the "non-professional" Revox trade name) and some of the professional Studer machines which are, of course, made by the same Willi Studer AG, in Regensdorf, Switzerland and Loffingen, Germany. Having had the rare opportunity to visit the

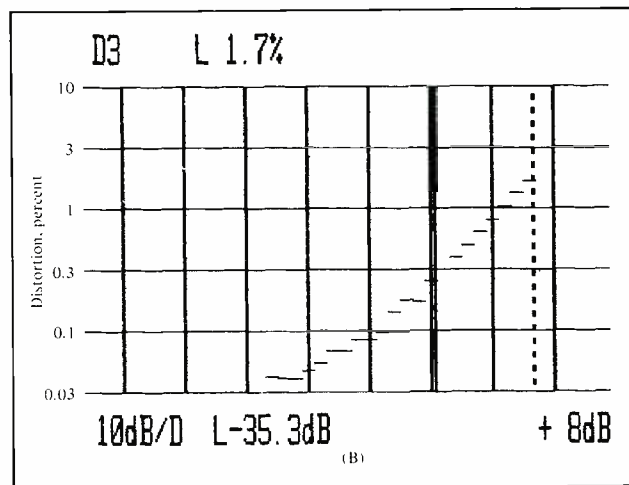
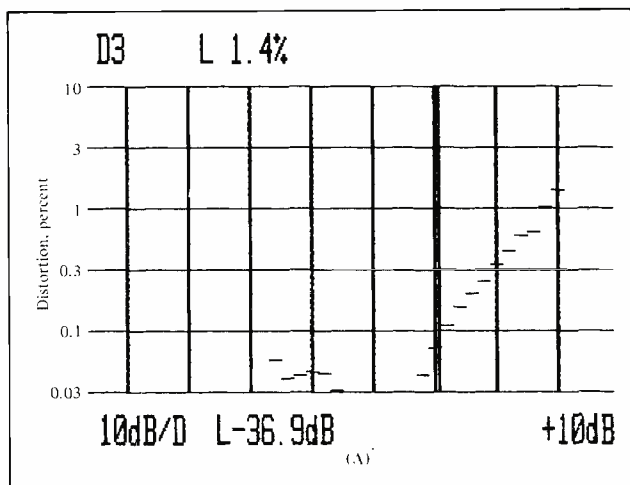


Figure 3. Third order harmonic distortion vs. record level, at 15 ips (A) and at 7½ ips (B). Double vertical

line corresponds to 0 dB (250 nWb/m) record level. Readings are at +10 dB (cursor position).



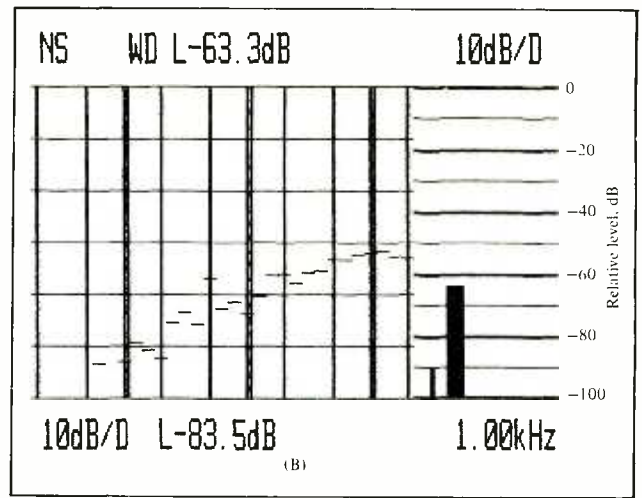
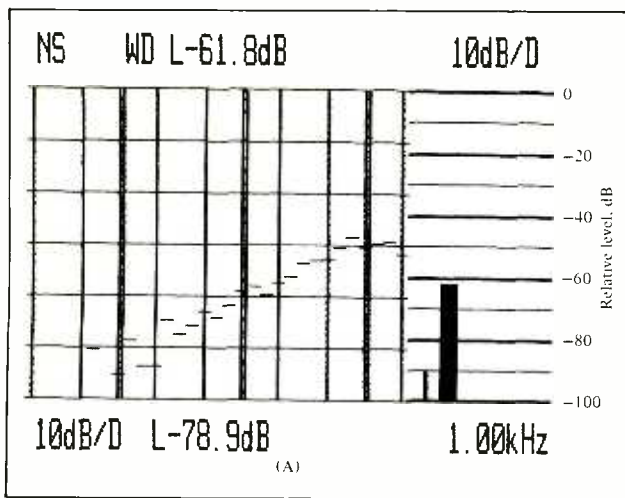


Figure 4. A-weighted signal-to-noise analysis, at 15 ips (A) and at 7½ ips (B). Reference level is 0 dB, to which should be added available headroom (see Figure 3).

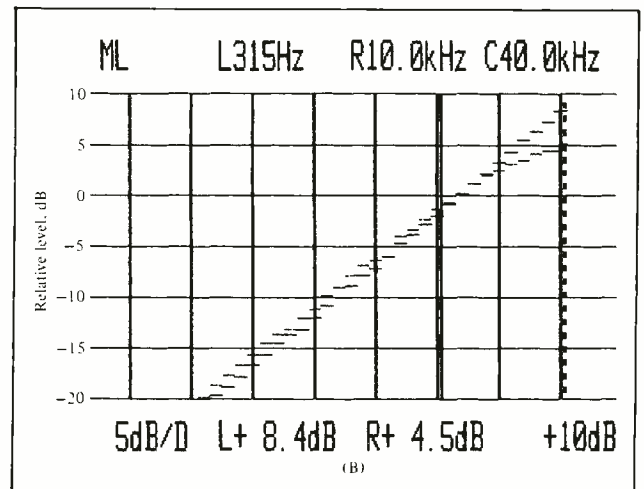
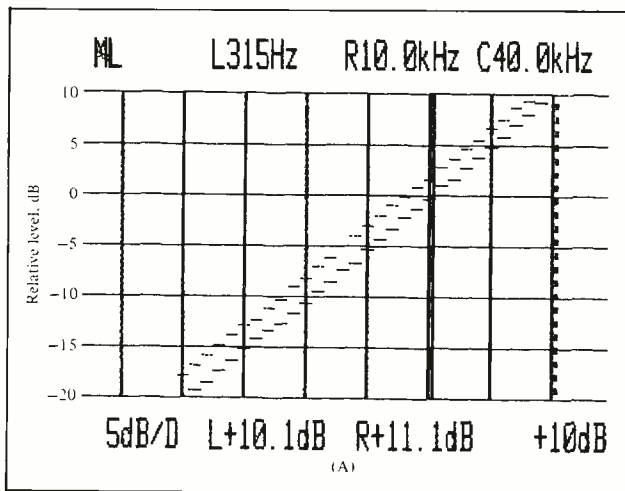


Figure 5. Linearity (output vs. input) measured at 315 Hz and 10 kHz, for 15 ips (A) and 7½ ips (B).

Willi Studer factories in Europe I can personally attest to the care and quality control that goes into every tape deck, be it a Revox or a Studer machine. I have also visited the Studer-Revox facilities in Nashville, Tennessee, where further quality control checks are performed after the machines reach this country. After you have had a chance to see what pains the company goes through to achieve absolute "roundness" on capstans and other critical machined parts which go into the transport mechanism of decks such as this, you begin to appreciate why Revox machines are not the most inexpensive in their class. On the other hand, I personally know of Revox units (and, for that matter, Studer pro units) that have been performing steadily for several years, eight to 12 hours per day, year in and year out, at radio stations and recording studios, with only routine maintenance and calibration needed to keep them in top shape.

As is usual with Revox products, the layout of the PR99's front panel was intelligent. I failed to mention earlier that on the right side panel of the unit there are no fewer than 22 small access holes which allow you to adjust and calibrate just about every item that

you might ever want to adjust and calibrate for this machine. There's never any need to "go inside" the unit. Even the VU meters and the peak LED indicators can be calibrated in this way. Azimuth adjustment of both the record and reproduce heads is also made easy; only a single screw needs to be turned and it is accessible as soon as the head block cover is removed. Using this Revox tape recorder I got the feeling that I was dealing with a well engineered product, designed and built in the land most famous for its precision manufacturing of quality timepieces. Willi Studer, the founder of the company, is still very much in command of operations, I'm told, and the PR99 is, to my mind, another example in the long line of products that have resulted from his insistence on absolute reliability, rugged durable construction, and the ultimate in precision machining and fabrication of the critical parts that go into a product such as this. There are few tape deck manufacturers today who build their own motors, for example. Willi Studer does. I could go on and on about the quality of this product, but you would be better off sampling it for yourself. Once you do, the price may not seem all that high after all.

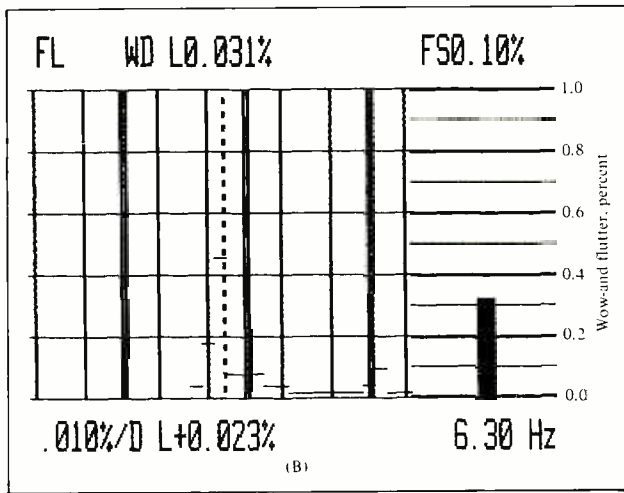
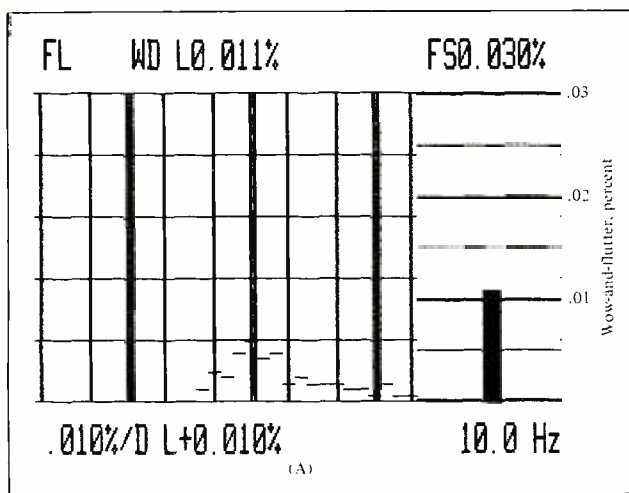


Figure 6. Wow-and-flutter analysis, at 15 ips (A) and at 7½ ips (B). Results printed above each graph are in % WRMS.

### REVOX PR 99 2-TRACK RECORDER/REPRODUCER: Vital Statistics

#### SPECIFICATIONS

##### Tape Speeds

##### Reel Capacity

Wow/Flutter, 15 ips

Wow/Flutter, 7½ ips

3rd Order HD at 0 dB—15/7½ ips

Level for 3% HD (15/7½ ips)

##### Frequency Response:

15 ips (Hz-kHz)

7½ ips (Hz-kHz)

Signal-to-Noise Ratio (Referred to 500 nWb/m, A-weighted)

15 ips

7½ ips

##### Crosstalk:

Stereo

Mono

Erase Depth

Line Input (0 dB)

Line Output (0 dB)

Phones Output

Power Consumption

Weight

Dimensions (W x H x D) inches

Centimeters

Mic/Line Mixing

Sound-on-Sound

Number of Heads

Number of Motors

Price:

#### MANUFACTURER'S CLAIM

15 & 7½ ips

(Comments: ±0.1%)

10½ inch

0.06%

0.08%

0.6/0.6%

N/A

30-22, +2/-3 dB

30-20, +2/-3 dB

More than 66 dB

More than 66 dB

Above 45 dB

Above 60 dB

75 dB, 1 kHz

0.775 V

0.775 V

5.6 V

90 watts max

40 lb. 12 oz.

19 x 15.72 x 9.21

48.3 x 39.9 x 23.4

No

Yes

3

3

\$??????????

#### MR&M MEASURED

Confirmed (Comment: ±0.1%)

Confirmed

0.011%

0.031%

0.07/0.25%

+13 dB/+10 dB

25-24, +2/-3 dB

30-24, +2/-3 dB

67.8 dB [(Comment: 74.8 (re 3% HD)]

69.3 dB [(Comment: 73.3 (re 3% HD)]

52 dB

Confirmed

Confirmed

Confirmed

Confirmed

N/A

83 W.

Confirmed

(incl. reel hubs)

(incl. reel hubs)

Confirmed

Confirmed

Confirmed

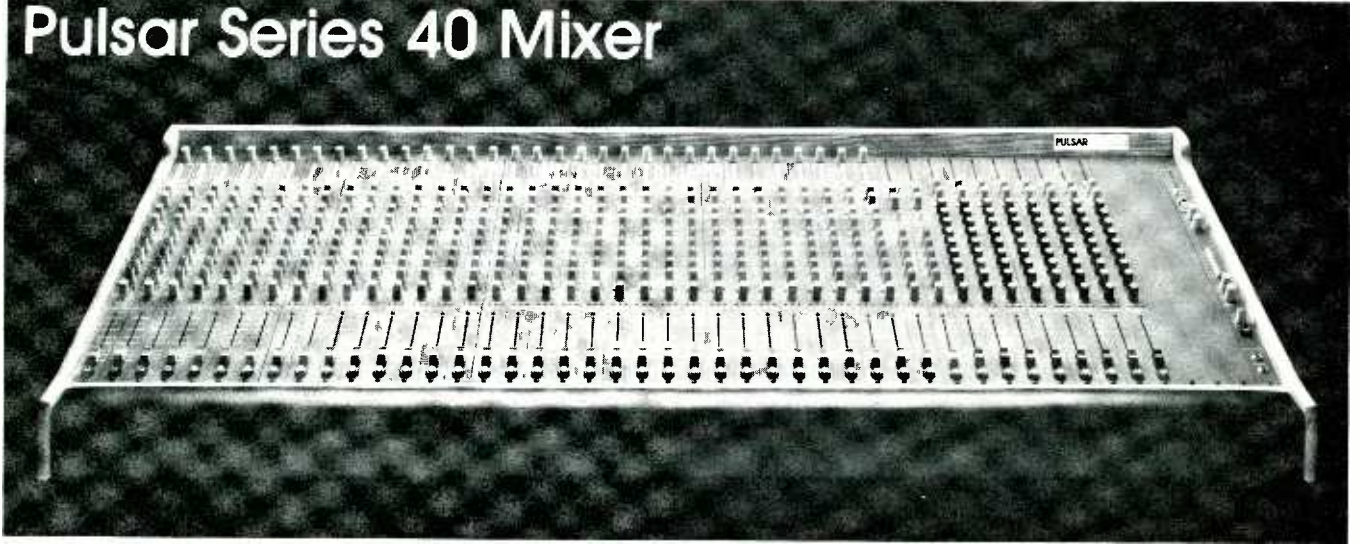
Confirmed

Circle 35 on Reader Service Card



# Musicians Notebook

## Pulsar Series 40 Mixer



Reviewing equipment is great fun...most of the time. This time, though, the Pulsar 40 mixer arrived late one Friday evening and I had to have the unit evaluated, and the review written and proofed, within 48 hours in order to meet *MR&M's* deadline. Talk about a whirlwind tour! I mention this not as a complaint, but as an explanation to those who are expecting the column to reflect my usual applications-oriented approach—simply stated, there was no time to get heavily into applications. What we can do, though, is cover the Pulsar 40's features, and explain some of its more interesting aspects.

**What is It?** The Pulsar 40 is a moderately-priced mixer intended for PA work, but which would also seem at home in any 4-track studio. Therefore, bands that need a mixer for road use and also have a 4-track recorder in their rehearsal studio could easily make the Pulsar do double-duty.

Like most mixers, the Pulsar can be broken down into smaller functional blocks. The model I reviewed had eight input modules, two effects return/monitor modules, four output modules, and a single talkback module, thus making it your basic 8-in, 4-out mixer. Let's look at each of these functional blocks in detail.

**Input Modules.** There are five connectors on the back of each input module. An XLR connector is optimized to handle low impedance (150 to 600 ohms) signal with pin 1 = ground, pin 2 = in-phase, and pin 3 = out-of-phase. A ¼-inch phone jack handles high or low impedance line level signals (for balanced signals, use a stereo plug with tip = in-phase and ring = out-of-phase; plugging in a mono jack automatically converts the input to unbalanced mono). There are two ¼-inch phone jacks for patching in Accessories (compressor, flanger, DDL, etc.); the ACC Out is a low impedance, unbalanced, post-preamp (but pre-EQ) jack that can also serve as a channel output, since plugging into

this jack does not interrupt the signal chain. (This latter feature is particularly useful if you want to bridge one input to two channels so that, say, the same signal can appear in different channels with different EQ; simply patch the ACC Out to the second channel's input.) An ACC In jack re-introduces the signal into the signal chain between the preamp and EQ. (Since this jack does break the signal path, if you have something plugged into the main channel input but want to quickly plug a temporary signal into the same channel, you could simply plug this temporary signal into the ACC In jack.)

The final input module connector is a ¼-inch phone, low impedance, post-EQ and post-fader Direct Out jack. This jack can also be useful for bridging an input across two channels if you want to add, say, delay to the equalized signal and then pan this delayed signal elsewhere in the stereo field without using the effects bus. Since the Direct Out is post-fader, both channels will track the input module fader so that fading out on one channel will cause the other channel to fade out as well.

Now let's move over to the input module front panel, as shown in *Figure 1*. The top control is a panpot that pans between the odd and even buses (pan left for 1 and 3, pan right for 2 and 4). The signal goes to both odd and even buses when panned to the center. Four SEND pushbuttons located below the panpot work independently of each other and let you send the signal to any, if all, of the four output buses (also called "groups").

Next comes a group of three switches, the first of which is a PHASE REVERSAL switch. Thankfully, this affects line as well as mic signals; for those of us who are into using special effects, especially effects which invert phase, this switch can come in quite handy. A LINE/MIC switch sets the channel up for either line-level high impedance signals or low-level low impedance signals, and a LO-CUT switch attenuates

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Produced by David Karr for Notch Productions.



signals below 100 Hz at 12 dB/octave to reduce room rumble, hum, and other low frequency garbage.

The next two controls send pre-EQ, pre-fader signals to the two monitor buses (MON 1 and MON 2). Additionally, MON 2 includes a switch so that you can change this signal from pre-EQ to post-fader. Right below this switch, there are two EFFECTS SEND controls that route the input signal to two effects buses (EFF 1 and EFF 2). These are post-EQ, post-fader signals.

A five-band equalizer (which does not use inductors, so it will not pick up hum) boosts or cuts at 80 Hz, 300 Hz, 1 kHz, 3 kHz, and 10 kHz. All five knobs have a center detent so that it's easy to find the flat response point. Although there are no provisions for altering these frequencies or changing the Q (resonance), for most applications this EQ will be more than sufficient. For problem cases, you could always patch a parametric or other EQ into the accessory jacks. The EQ section also includes an IN/OUT switch, although it is not entirely clickless—if you're going to switch EQ in or out, do so on the beat.

Enabling the MUTE switch located right below the EQ mutes the signal going to the four main output buses and the effects buses, but does not affect any sends going to the monitor buses or cue bus. Thus, you could monitor a signal without having this go out over the main buses, and when appropriate, release MUTE to add the signal into the main mix.

We're almost finished with the input module. An INPUT GAIN control sets the preamp gain from 6 to 50 dB, and includes three LEDs (-15 dB, 0 dB, and +15 dB) to aid in level-setting. These LEDs are connected post-preamp, post-EQ, and post-fader so that even if your mic preamp is not distorting, if there's an overload elsewhere in the input module (say, from boosting an EQ band too heavily), this will show up on the LEDs. Note that you must add about 24 dB of gain when feeding in line level signals, as the line signal is attenuated before hitting the mic preamp and the input gain brings it back up to its initial level. I prefer bypassing the mic preamp when using line level signals. However, Pulsar's approach does let you compensate for line signals with varying nominal levels.

Finally, there's a linear slide fader and CUE button. The fader sends the signal into the main output buses selected with the four SEND pushbuttons and panpot. Pushing the CUE button sends a post-EQ, pre-fader cue signal to a mixer in the talkback module (described later), and switches the cue bus signal into the headphone output (also located in the talkback module).

**Effects/monitor Modules.** Each back panel effects/monitor section includes a 600-ohm, balanced XLR output controlled by the main effects fader, along with two accessory jacks if you want to add processing to the overall effects bus signal (for example, if the effects bus is set up for reverb you could patch in a digital delay line to create pre-delay effects). An additional XLR connector carries the monitor bus signal and is controlled by the monitor level master. The monitor signal path also includes a pair of accessory jacks.

Looking at this section's front panel (see *Figure 2*), at the top there is a 10-LED VU meter which can monitor either the MONITOR OUT or EFFECTS RETURN

signals. The monitoring occurs post-accessory loop, and therefore reflects any level changes caused by patching in additional processors.

Next come two monitor controls, MONITOR OUT (sets the amount of monitor signal appearing at the rear panel output jack) and MONITOR BUS (sets the monitor signal going to the headphone bus on the talkback module). Since there are two effects/monitor modules, each module handles the functions for one channel of the stereo pair.

These controls are followed by an EFFECT IN/OUT switch. With this switch out, the pre-EQ, pre-fader mix appearing at the Effect Out jack is determined solely by the input module EFFECT SEND control settings and includes no processing. When in, whichever effect is patched into the effects bus will now affect the effects mix. If no effect is patched into the effects bus accessory jacks, then flipping the EFFECT switch to IN will mute the effects bus signal.

Next there's another five-band EQ, which is identical to the one used for the input module except that it has no IN/OUT switch. EQ can really tighten up a reverb sound by attenuating the very lowest frequencies (where "muddiness" occurs) and the treble frequencies (where noise is most noticeable). Also like the input module, there is a master slide fader and below each fader, there is a CUE button which feeds a post-EQ, pre-fader signal to the cue bus and also switches this cue signal into the headphones. The fader controls the amount of EFFECTS RETURN being sent to the matrix mix (described next).

**Output Module.** The output stage is somewhat unusual in that it includes two submixing functions, one called *group* and the other *matrix*. Each has its own rear panel XLR output jack (with group output controlled by the module's main fader, and matrix by the matrix master level control). Each also has ¼-inch phone accessory jacks (unbalanced, low impedance). The main way these two submixes differ is in the way signals are sent to them via the front panel controls.

Looking at the output module front panel (see *Figure 3*), the first feature you encounter is a 10-LED meter which can monitor either the group or matrix output. Next comes two monitor controls (MON REC 1 and MON REC 2); these set the amount of the monitor 1 and 2 bus signals (sent from the monitor bus controls on the effect 1 and 2 modules) to be added to the mix. Two more controls (EFFECT REC 1 and EFFECT REC 2) perform a similar function for the two effects bus outputs, as sent by the effects module master faders.

Below these four controls is a GROUP/MATRIX switch which determines whether the monitor and effects signals will be summed into the group or matrix output. With GROUP selected, the monitor and effects signal will be controlled by this module's main group fader. With MATRIX selected, the monitor and effects signals will be controlled by a separate MATRIX MASTER control (located just above the three-LED meter, which in turn is located above the main group fader).

Next we encounter four more controls, GROUP REC 1-4. These send variable amounts of the four group mixes (from the four main group faders on the four output modules) to the matrix mix. Finally, there's the MATRIX MASTER control (mentioned in the previous paragraph) that varies the level of the matrix mix signal, a three-LED meter that monitors this signal (remember, the



LED meter at the top of each output module can also monitor this signal), and a main group fader. This fader drives the back panel Group Output jack as well as the GROUP REC 1-4 controls (for all four output modules) mentioned above.

The key to getting the most out of this mixer is the matrix mix, which can contain quite a bit of audio information. For example, channel 1's matrix output will contain a mono mix of each of the four group outputs, and if the GROUP/MATRIX switch is in the MATRIX position, any desired amount of the monitor and effect bus signals. Channels 2, 3, and 4 can also contain a mix of the group outputs and, if desired, monitor and effects bus signals. Although it seems that Pulsar sees the major advantage of matrix mixing as a way to separate subgroups of instruments live, I should add that for small studios, this kind of arrangement makes it easy to add creative stereo processing effects to the overall sound. (For example, the effects bus outputs, as well as the group outputs, could be mixed through a matrix output, re-processed through additional delay, and sent back into a spare channel.)

**Talkback Module.** All that's left now is the talkback module. The back panel has only one connector, which accepts power from a remote power supply; unfortunately, this supply uses a ventilation fan which is by no means whisper-quiet. I was sorely tempted to disconnect it (I like low ambient noise levels) but the manual specifically warned against this.

Moving along to the front panel (*Figure 4*), there's a 10-LED meter to indicate the cue bus level. Right below this, a PHANTOM POWER switch, when on, sends +48V through two resistors to pins 2 and 3 of the input module XLR connectors.

Next, an XLR connector accepts a mic output that can be mixed into the monitor bus for talkback purposes. Remember that the monitor signals can be mixed into the monitor, group, or matrix outputs; therefore, the operator can talkback through any or all of these outputs. Two associated controls, MON 1 SEND and MON 2 SEND, control the talkback signal level being sent to the two monitor buses. The next switch below these two controls provides the PUSH-TO-TALK function.

Five more pushbutton switches send different outputs into the headphones. The first button sends GROUP 1 and GROUP 2 signals to the left and right headphones respectively; the second button acts similarly for GROUP 3 and GROUP 4; the third button acts similarly for MATRIX 1 and MATRIX 2; the fourth button affects MATRIX 3 and MATRIX 4; the fifth button affects the MON 1 and MON 2 outputs. A sixth and final button selects MONO or STEREO for the headphones. This multiple button approach makes it easy to instantly monitor individual bus outputs or combinations of buses.

The next control, PAN, is used with the various buttons to select mono or stereo versions of various bus outputs in the phones. For example, if you wanted to listen to MON 1 only, you would press the fifth pushbutton, rotate the panpot to the left so that you heard only the MON 1 signal, then set the STEREO/MONOSwitch to MONO so that you would hear the signal equally in both headphones.

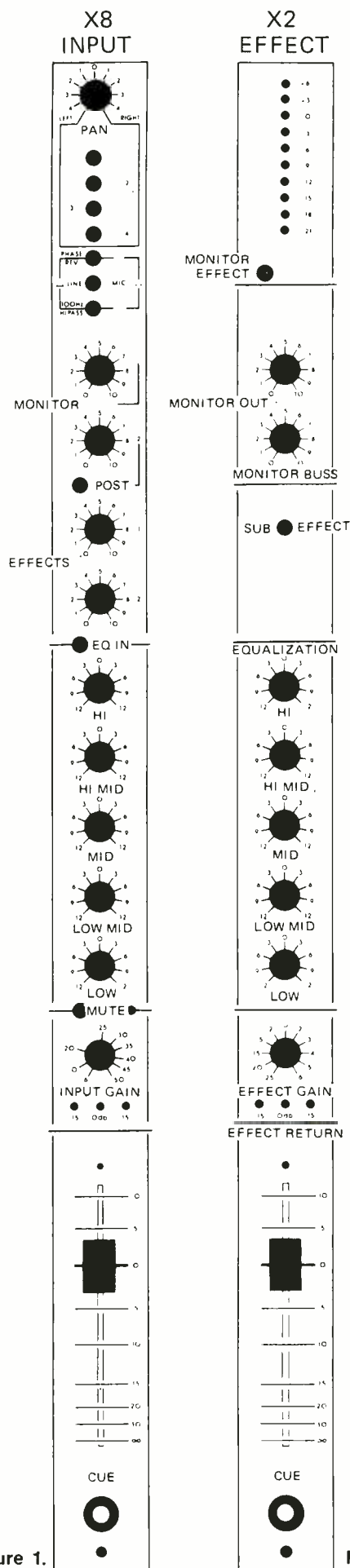


Figure 1.

Figure 2.



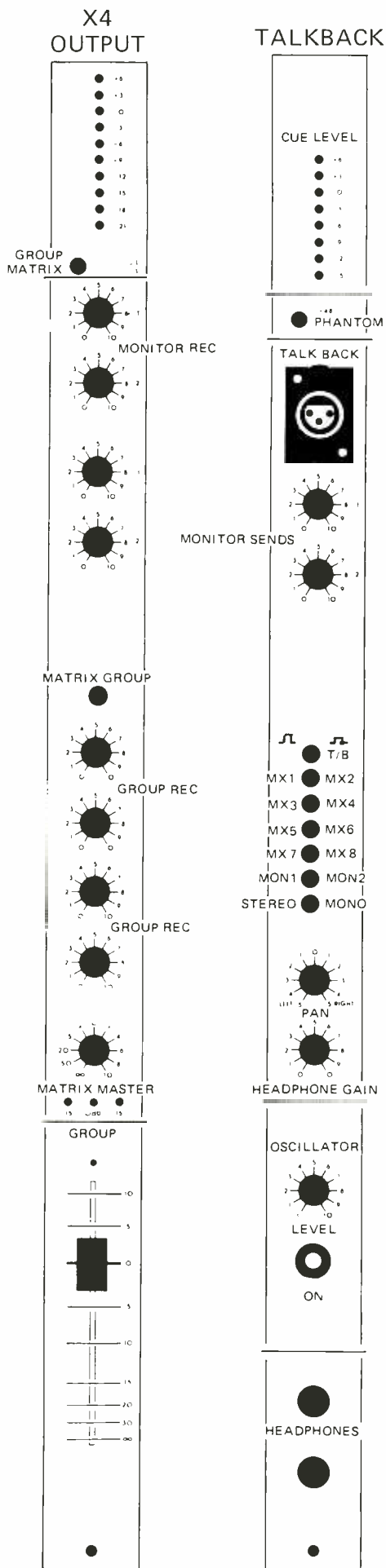


Figure 3.

Figure 4.

There are two headphone jacks available on the front panel, as well as a headphone gain control. If you press any of the input module CUE buttons, that signal will override any signals already being sent to the headphones. Thus, if you want to audition each channel to check on EQ, distortion, etc., simply press the appropriate CUE buttons. To hear the channel in the context of the mix, simply release the button.

**Overall Evaluation.** Okay, so you've got a pretty quiet mixer, a bunch of LEDs to monitor what's going on, lots of patch points, and a variety of ways to do sub-mixes. For live use, this mixer can provide a number of monitor mixes to different musicians as well as a mix to the house and maybe even some direct tracks if you're recording the event live. Of course, an 8-in, 4-out mixer might not be enough, but Pulsar does make models with more channels if you need something bigger.

Concerning reliability, the Pulsar 40 generally seems well-made. Unlike most review units I receive that are shipped brand-new off the assembly line, the mixer I checked out had reputedly travelled thousands of miles and had even been sitting in 1/4 inch of water at one point. Perhaps that explains why there were some seemingly random transients that created popping sounds strong enough to register on the output LED meters; my guess is that this problem was not related to the mixer itself, but rather, to an intermittent connection in the power supply (however, I was unable to confirm this). These clicks were only audible with the master group faders up a fair amount. The only other problem I encountered was a scratchy pot or two.

The manual is reasonably helpful in describing functions, but somewhat deficient in telling you how to apply these functions in a real-world context. Although examples are supplied of how to use the matrix mixing function to separate instruments into numerous sub-mixes, it never quite explains why you would want all these sub-mixes in the first place. Sure, most of the people who are in the market for a mixer will probably be familiar with general mixing techniques, but I always feel companies are much better off if they assume minimal knowledge on the part of the user. Also, there is no block diagram of the mixer, although there are complete schematics. I greatly appreciated seeing the schematics; they helped settle several questions I had that were not fully answered by the text. However, many musicians are intimidated by schematics, and I think that a block diagram—perhaps a fold-out or tear-out sheet that could be referred to while reading the manual—would be most helpful.

One more thing: If you've got a 4-track studio, there's a lot you can do with the Pulsar with respect to sweetening and adding ambience via the various submixes. Again, this is something which is barely touched on in the manual, but if you have a creative bent there are enough patch points and controls to accommodate you.

All in all, the Pulsar 40 offers flexibility in a reasonably small package. If you'd like a good mixer for the road that also allows for experimentation in a small studio, the Pulsar 40 just might be the mixer that you've been seeking.

# Sound Advice

## The Declaration of Equalization

Today, multiband equalization is a standard unit in any sound system. The concept goes back to the 1950s, when switchable frequency controls appeared on some pre-amps used in high fidelity equipment for consumer use. In the '60s, Shure brought out the M-67 preamp, an affordable unit with sweepable frequency controls. It wasn't until solid-state technology revolutionized the pro sound industry in the late '60s and early '70s that graphic equalizers became affordable and available.

Multiband equalization provides many important capabilities to sound technicians. It allows you to clean up uneven response of the speaker system, eliminate or minimize feedback, roll off high-end hiss or low-end hiss or low-end rumble, and create specific tonalities for special effects.

In club PA systems, the most common application of equalizers deals with smoothing out the frequency response of the main system and monitors. While even the best equalizer cannot save a poor sound system, a good equalizer, used properly, can do wonders for a mediocre one. Mismatched components or a mismatched crossover in a speaker system can cause an imbalance between the highs, mids and lows, and an equalizer can help correct this. Sensitive equalization will also control the smaller aberrations, those little "bumps," "nodes," or peaks in the response of any component or the complete system.

Equalization is available in several forms and from many manufacturers. The most common form is the graphic EQ, available in different band numbers, usually 10, 15, or 31. The number of bands relates to the frac-

tions of sound frequency octaves being controlled. It's important to remember that each time a frequency is doubled, it constitutes an octave. The frequency mark on an octave EQ will be approximately 31, 63, 125, 250, 500, 1K (1 kHz), 2K, 4K, 8K, and 16K. That works out to 10 frequency bands. A 2/3-octave unit has 15 bands and a 1/3-octave unit has 31, marked at 20, 25, 31.5, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1K, 1.25K, 1.6K, 2K, 2.5K, 3.15K, 4K, 5K, 6.3K, 8K, 10K, 12.5K, 16K, and 20K.

You can see that the audio spectrum can be divided into rather small segments, the levels of which can be controlled plus or minus 10, 12, or 15 dB, depending on how the unit is designed. Obviously it is to your advantage to have as much boost or cut as possible, so most professional EQ manufacturers design for 15 dB.

There is another kind of EQ we should mention, the parametric equalizer. This type divides the audio spectrum only two or three times, but it allows you to move the point of control to an exact frequency via a frequency sweep control. Let's say you need a level boost of 720 Hz. No graphic EQ has a control at that spot, but with a parametric EQ you can move the point of adjustment to that exact frequency and boost or cut as needed. The parametric also has a "width" control which varies the distance the adjustment point spreads. For instance, if you are boosting at 720 Hz, you will always be boosting adjacent frequencies on a graphic EQ. How far above or below 720 Hz do you really need to go? The width control allows you to choose. The

main advantage to the parametric EQ is the ability to make adjustments at any exact frequency; the drawback is that you are limited to two or three sections of the EQ to work with, whereas a graphic gives you 10, 15, or 31.

There are also some paragraphic EQs on the market that combine the advantages of multiband and sweepable frequency, but their use in club-style PA work is by no means extensive at present.

A 31-band EQ divides the audio spectrum so finely that it is very unlikely that you would have a problem making a correction anywhere, and that is why it is the most popular for sound systems. The graphic EQ is so named because the controls slide up and down and, when set, form a visual graph of what the EQ unit is doing to the input signal. If you set your graphic EQ to make the sound system output signal look like the input (ideally they should match equally), you will see a graph that is the inverse of your system's.

The idea, of course, is that every boost or cut of the EQ counteracts a dip or peak in your system or the effects of the facility in which you're set up. There is usually a basic EQ curve for a given set-up that makes corrections for that system's inherent flaws, and also a house curve that is superimposed for each venue you work in. It is impossible to know exactly what the house curve is, but you can make educated guesses based on your knowledge of acoustics and how shapes and surfaces create effects with sound.

Most of you are probably familiar with equalization analyzers and know that they are one of the best



tools for setting an EQ unit. An EQ analyzer is really two calibrated units: a noise generator and a microphone/analyzer unit. The noise generator creates either "white noise" or "pink noise," which are equal generations of all the frequencies in the audio spectrum. Pink noise is most commonly used with audio analysis since it resembles music more closely. If you plug the generator directly into the analyzer you would see a flat line on the LED display, indicating that there are equal levels of all frequencies coming from the generator. The analyzer's LED readout is calibrated the same as an octave or 1/3-octave EQ unit so that the frequencies match on both units. This way, if the analyzer indicates a peak level at a certain frequency, it is easy to adjust the EQ by using the matching control.

The first step in using the EQ analyzer would be to plug the generator into your mixing board input (any channel), making sure the channel's own EQ controls are set flat, and that your main EQ is flat as well. Bring the level up and you will hear the pink noise; it will sound like Niagara Falls. The analyzer's mic will pick up the sound and display it. You will want this to end up close to being flat, like when the generator was plugged directly into the analyzer. The difference is that your sound system and the room acoustics are now inserted in the signal path from generator to analyzer. Ideally, neither should have any effect on any signal entering the system. In reality, of course, there are lots of effects, and these will show up on the analyzer's display. You can then set your graphic EQ to counteract whatever "coloration" occurs between the sound entering the system and the audience's ears.

When taking a reading, you will want to be in typical listening locations in the venue; there's no sense in tuning a system to sound good in a location no one will be occupying. Many analyzers have memory storage which enables you to check two locations and compare readings. If your two readings have very different shapes on the readout, you have an unevenness which could be caused by several factors; poor directivity of speaker system, bad driver or speaker, poor aiming of speakers, effects of the house, or some other factors.

The analyzer and pink noise allow you to find abnormalities easier than

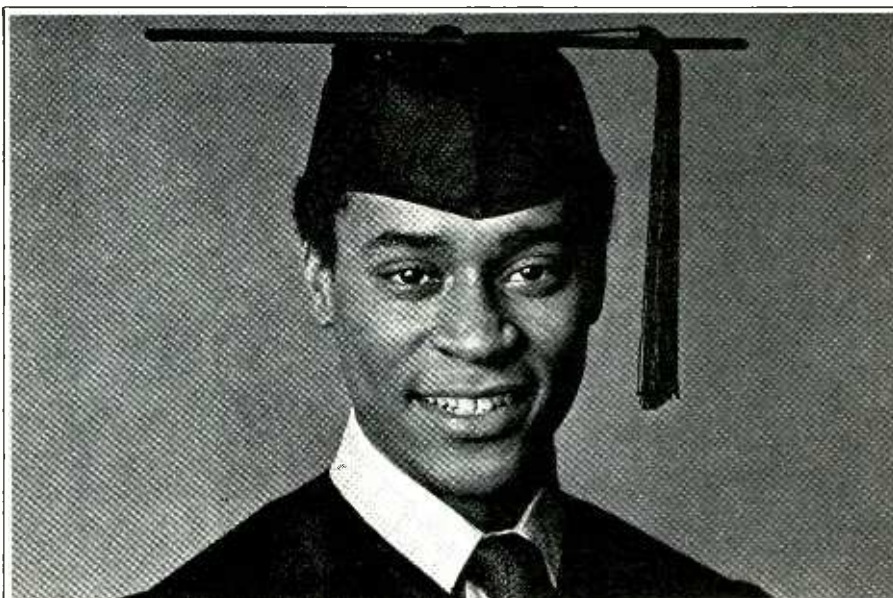
playing music and trying to hear the unevenness in various locations in the room. It is a valuable tool. However, an audio analyzer can be as expensive as a good used Buick. There are several manufacturers marketing them, including Ivie, Shure, Gold Line, and Crown. Some are battery-powered and portable (preferred); others are rack-mounted and you must use a mic on a cord, which may limit your range of test area.

What if an EQ analyzer is out of your budget? How do you set up your EQ unit? One of the most common methods is to use a test tape of music that you are familiar with and have heard on a good stereo several times. The music should contain many sounds and have good dynamic range. You can use whatever you like, but it is worthwhile to use music that challenges the tonal response of your system. Once you have memorized the sound of that tape, you can play it through the system and adjust your EQ to get close to the sound you remember. Obviously, your hearing and your memory are not always perfect.

Another method involves using feedback. Using a mic with flat re-

sponse (check the response curve supplied by the manufacturer), position it in the audience area and turn its channel up to the point where feedback begins. Usually one frequency will begin to feed back first. Find that frequency on your EQ and back it down slightly. Bring the level up some more on the test mic's channel until feedback begins again. Find that frequency on your EQ once again and back it down. Continue this several times and you will get to the point where several frequencies are feeding back simultaneously and it is impossible to make corrections any further. Your system will be fairly tuned for that mic location and you can test it in some other locations. This process can be time consuming; it is necessary to have relative silence when you use this method, because other sounds can induce feedback. You want the system itself to generate the feedback levels that are peaks in your response.

Whether you can afford an analyzer or must use one of the alternative methods we have outlined, careful setting of a good EQ unit will do any sound system a world of good.



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# Practical Music Video Production

## Part 2: Video Switcher Operation

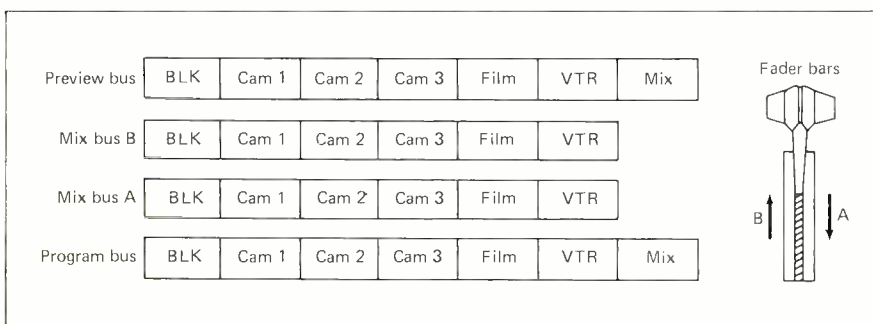


Figure 1. A simple production switcher.

Last month we took you through the technical fundamentals of video recording. This month we'll go into the studio and begin covering the actual hands-on operation of the gear.

### The Video Production Studio

A typical video production studio consists of a small, isolated control

room and a larger, open soundstage where the shooting itself takes place. As with audio recording studios, the exact layout and room design will vary from studio to studio, but the basic features remain standard.

You can figure the soundstage will have a lighting system overhead, room for the cameras to move around freely on a hard, smooth floor, and a cyclorama or backdrop of some kind.

In the control room, the prominent feature is a bank of television monitors arrayed over a console which houses the video switcher. There will be some kind of audio mixer available, along with an audio monitor system. The videotape machines and equipment racks will either be in the control room or in an adjoining "engineering" bay.

The switcher console is the main control center in the video studio, much like the audio mixer is the main control center in a recording studio. Just as an audio mixer lets you combine signals from several different sources, add effects, and send the output to your tape recorder, the video switcher lets you take signals from several different cameras or VTRs, select one individually or combine them together for special effects, and then send the output to a videotape recorder.

In practical operation, then, the switcher allows you to set up several cameras and switch back and forth





guitar solo is coming in order to get his shot set up and be ready on cue when the solo begins.

For this reason the director and his crew are in constant communication via intercom headsets. If you were to listen in during a shoot, you'd hear a running stream of camera directions and switching cues from the director: "Ready to take 1, and... take 1. Camera 2, I need a close-up of the guitar player. A little tighter, Camera 2. That's good. Hold your shot, 1. Standby, here comes the solo. Ready 2, and...take 2. Great. Camera 1, get me a medium shot of the keyboards..." And so on. (We'll cover camera directions and director's commands in future installments.)

We'll assume you've managed to juggle your two cameras well enough to cover the action and that the band is coming to the end of their song. When they finish, you push "Black" in order to wind up with a blank screen again, then shut off the recorder.

That's the way switching works, in a simplified nutshell. Real video switchers can do a lot more for you, as we'll see.

## Basic Switcher Operation

Figure 1 shows the layout for a simple production switcher like the ones you're likely to encounter in a small-format studio. Switchers vary greatly in complexity and configuration, but this is a typical arrangement. Note that there are four rows of buttons, called "buses." There's the program bus, two mix buses (with fader bars), and a preview bus.

## The Program Bus

The program bus works exactly like our imaginary three-button switcher did—whichever button we select on the program bus will determine which signal is sent to the tape. The only difference is that now we have more video sources to choose from: three cameras, a VTR, and a "film chain" (a special projection system which allows us to transfer movies or slides onto videotape).

Each video source has its own monitor, as before. Thus we have separate monitors for cameras 1, 2, and 3, plus monitors labeled "VTR" and "Film." We have a "Program monitor, as before, which shows us the signal we're sending to tape, and finally a monitor labeled "Preview." (No wonder video control consoles resemble a showroom for Bob's TV Heaven!)

Pushing the camera buttons will send the selected camera output to the tape, as before. The VTR button will send the output of a playback VTR to the tape (perhaps a pre-recorded backstage interview segment, or a clip from an old episode of *Mister Ed*). The FILM button will send the output of the film chain (slides? 8mm movies?) to tape. The MIX button sends the output of the mix buses to the tape. Let's go ahead and punch up MIX on the program bus, so we can see what the mix buses do.

## The Mix Buses

The A and B mix buses allow you to combine images from two sources to create fades, dissolves, and supers. In a fade, the picture either appears gradually on the screen from black (a fade-in) or darkens gradually into black (a fade-out). A dissolve is a smooth transition between shots wherein one picture gradually blends into the other. In a super (as in "superimposed"), both shots appear at the same time, like a double exposure. All of these effects can be accomplished on the mix buses with their accompanying fader bars.

The fader bars gradually activate either bus A or bus B, depending on how far you move them toward the A or B position. With the fader bars in the A position, you get whatever is punched up on mix bus A; with the fader bars in the B position, you get whatever is punched up on mix bus B. With the faders in the middle, between A and B, you get a blend of both.

To do a fade-in from black to camera 1, you punch up BLACK on mix bus A and CAMERA 1 on mix bus B. As you push the fader bars from position A to position B, the screen gradually changes from black into the picture from camera 1.

Now let's try a dissolve from camera 1 to camera 2. Camera 1 is already "on the air," punched up on mix bus B, so we'll punch up CAMERA 2 on mix bus A. (Since the fader bars are still in B position, bus A is deactivated; any changes we make on A will not affect our tape until we move the fader.) Now as you pull the fader bars from position B to position A, the picture gradually changes from camera 1 to camera 2. If you stop in the middle, both camera's shots appear, overlapped, and you have a super. If you push the bars back into the B position, the picture gradually changes back to camera 1 again.


Let's fade to black. Should you punch BLACK on mix bus A, or on mix bus B? It depends on which bus is currently activated by the fader bars. If you punch BLACK on the activated bus, the picture will instantly cut to black, just as if you'd punched BLACK on the program bus. This is handy if we want an instant cut, but we don't want that; we want to fade out gradually. To set up the fade, punch up BLACK on the *deactivated* bus. (The picture from the activated bus will remain unaffected until you move the fader bars.) Then when you're ready for the fade-out, pulling the bars will gradually deactivate the bus with the picture, and activate the bus punched BLACK. The result is a nice smooth fade-out.

Note that you can do fades, dissolves, or supers with any of your video sources, not just cameras. You could fade in on a cheesy Japanese horror movie, for example, cut to a pre-recorded videotape segment of the band fleeing through the streets, super a title slide as they duck into the studio to escape the monster, then dissolve to live action cameras for their performance, complete with camera-jarring footsteps and chunks of falling plaster. (Hey, where else can a band survive the destruction of Tokyo for \$27.50?)

Note also that you must have MIX punched up on the *program bus* in order to be sending the mix bus output to the tape. Any other selection on the program bus will override the mix bus output and go to the tape instead. Why this extra complication? Because it allows you to pull the mix buses off-line and use them to set up effects in advance while something else is going to the tape. That's where the preview bus comes into play.

## The Preview Bus

The preview bus works exactly like the program bus, except that its output goes only to the "preview" monitor—not to the tape. You can punch up MIX on the preview bus and use the preview monitor to set up a super (or some other effect) without having all your set-up adjustments going onto the tape. Then at the right moment, you simply punch MIX on the program bus, and the super is right there, pre-arranged and ready. As we get into more complex special effects, the preview bus will become increasingly useful in this regard.

Next month we'll head out onto the soundstage and show you how to operate the big studio cameras. 



# Hacker's Digest

Two months ago we examined some of the design features inherent in most microprocessors, concentrating mainly on a hypothetical description of their functioning subsystems and the micro-programming which manipulates them. That architecture overview illustrated the microprocessor's role as a programmable logic unit, able to process information according to its instructions. This month I would like to bring that conceptual discussion down to earth with two microprocessor examples. First we will take a look at the Intel 8085A, one of the most powerful and popular microprocessor chips on the market. Secondly, we will briefly check out an applications example: the microprocessor system commonly found in Compact Disc players, as exemplified by the Hitachi DA-1000.

## A Very Popular Chip

The first 8-bit microprocessor was the Intel 8008, introduced way back in 1971 (the Dark Ages of Digital). By today's standards it was a pretty miserable chip, but it was the forerunner of the Intel 8080, introduced in 1973, which went on to become the single most popular microprocessor, used in more applications than all other microprocessors combined. Its offsprings, the Z-80A and the 8085A, are two thoroughbreds in their own right. The 8085A is especially notable in its faster memory access times, and more total consolidations of system parts inside the chip itself. It is thus faster and needs fewer external components, things that every design engineer dreams of. The engineer's opinion is important in the world of microprocessor marketing. Design engineers are the people who design products, and they are anxious to make the design as simple as possible both to lower manufacturing costs, and save themselves a little work (I speak from experience). Thus they're attracted to parts which automatically carry much of the load. Believe me, the 8085A is a popular chip.

The internal architecture of the 8085A is shown in *Figure 1*; the four microprocessor subsystems (arithmetic logic unit, working registers, control unit, and internal data bus) are clearly represented. The wide variety of registers is especially important; this greatly expands the microprocessor's ability to handle data efficiently. The 8085A has a register array with both dedicated and general purpose registers. The dedicated registers are already spoken for by the microprocessor, but the general purpose registers are available for programming. There are six addressable, 8-bit general purpose registers which are grouped as three 16-bit pairs: BC, DE, and HL. An instruction such as 'ADD M' takes the contents of the memory location whose address is

to our example last month; the bus which brings in the instructions first encounters the instruction register and the decoder which interprets the instructions. The decoder output coordinates the control unit's operation, which in turn activates the registers, ALU, and data and address bus. Many of the status lines such as READY and RESETOUT appear at the chip's output pins.

There are other features of the 8085A such as memory-mapping and multiplexed data/address lines which further enhance its utility, but the point is that the chip is a very nicely configured package. Speaking of packages, the user sees the 8085A in its standard dual-in-line 40-pin package; the chip's footprint is shown in *Figure 2*. Since there is an on-board clock, only a crystal connected across

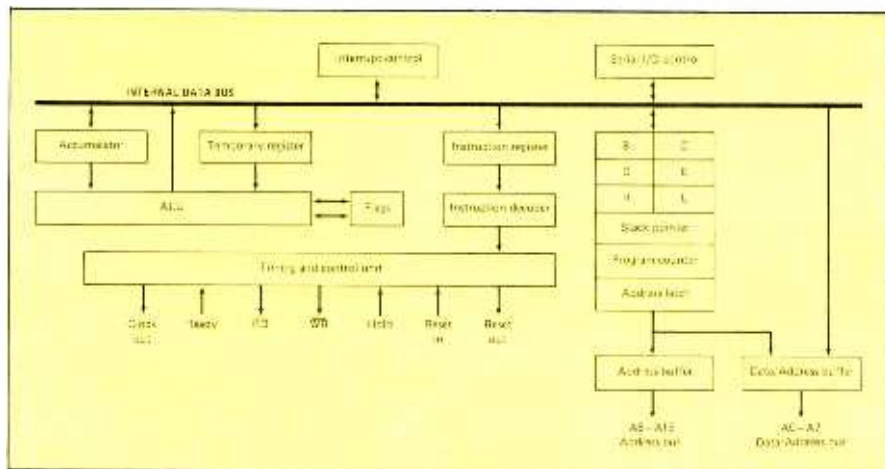


Figure 1. Functional block diagram of the 8085A CPU.

contained in the H and L registers and adds it to the contents of the accumulator; this pairing of registers makes for very efficient programming. Other registers are those we discussed last month—a 16-bit program counter (PC), a 16-bit stack pointer (SP), an 8-bit accumulator, and a flag register. The accumulator and flag registers are actually located inside the ALU to speed up processing.

The control unit, with its flock of status lines, is also closely configured

pins X1 and X2 is needed to set the chip's oscillator going. A 6.25 MHz crystal would typically be used to yield an internal 3.125 MHz clock pulse. CLK (OUT) is derived from one phase of the clock and is used to run synchronous external devices. Eight of the chip's 16 address lines appear on address pins A8-A15. The other eight, as I mentioned, are shared with eight data bits on ADO-AD7. Other chip pins provide control signals for operations such as system bus control, READ, WRITE, and mem-

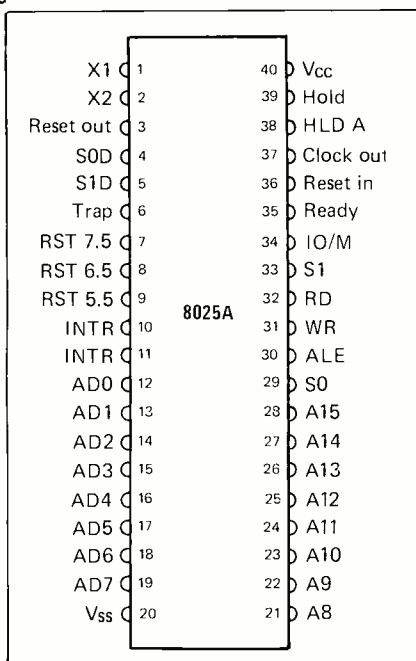


Figure 2. Pinout diagram of the 8085A—"footprint."

ory or I/O port selection.

The 8085A thus satisfies several important criteria; for example, it runs at a faster rate than its predecessors, and the use of multiplexed address/data lines frees seven lines

under the cover are revealed, the system becomes even more impressive. We owe much of that sophistication to the fact that all CD players have one or more microprocessors in command of the situation. Consider some of the aspects of a player's operation: the laser beam must be automatically focused on the disc surface; the beam must maintain optical tracking of the pit track; errors must be detected and corrected; the pick-up and disc drive motors must be regulated; User-programmable features and features such as jump-forward and jump-reverse must be provided for, and, of course, the entire flow of digital audio data must be governed. Microprocessors can manage all of this. Without microprocessors, a Compact Disc player would probably be the size of a Samsonite suitcase and cost as much as a month's vacation in Tahiti.

The Hitachi DA-1000 Compact Disc player has three microprocessor chips, each managing part of the player's operation; a block diagram of the microprocessor system is shown in Figure 3. The system microcomputer (HD44820A75) is a 54-pin chip which is master control for the

focus and compensates if necessary, activates the laser diode, checks and compensates for tracking, makes jump forward and reverse, accomplishes digital and audio muting, regulates the digital-to-analog converter, controls the drive motor, reads disc table of contents, monitors the error flag status, etc.

The third microcomputer, the gain control chip, has 28 pins; it is slaved exclusively to the system and access computers. It independently receives error flags, gain control signals, and jump commands. With this microcomputer, during the initial read, the tracking gain may be varied to correspond to various disc characteristics; this is important because disc reflectivity differs, so the amount of laser light reflected varies too. Each player must automatically adjust its circuitry to provide the best signal for each disc. In particular, the gain control microprocessor sets the best voltage level for the tracking actuator to keep the laser beam precisely aligned with the pit track as the disc is played.

Working together, these chips control most of the operation of the Compact Disc player. They provide a prime example of the cost-effectiveness of using microprogrammable chips. One of the great advantages of digital audio (aside from its great sound) is the opportunity it provides for employing microprocessors in the circuit design. While analog audio equipment might use digital control of transport and display in a hybrid fashion, only digital audio equipment can fully realize the potential of a microcomputer system controlling all aspects of both the control data and audio data. The bottom line, as we have seen, is higher technology at a lower cost.

There you have it. These microprocessor discussions have taken you from inside the chip itself, through the pin-outs to the real world, and finally to the interconnections comprising an entire system. I hope this has helped you to better understand the nature of microprocessors, and be able to deal with the many applications in which they'll be appearing. As audio and other technologies go digital, you'll be seeing more and more of the microprocessor. A final word: The price of all that high technology crammed on a tiny chip is about as tiny as the chip itself. A microprocessor typically sells for less than 10 bucks. Is that a good deal? You better believe it is.

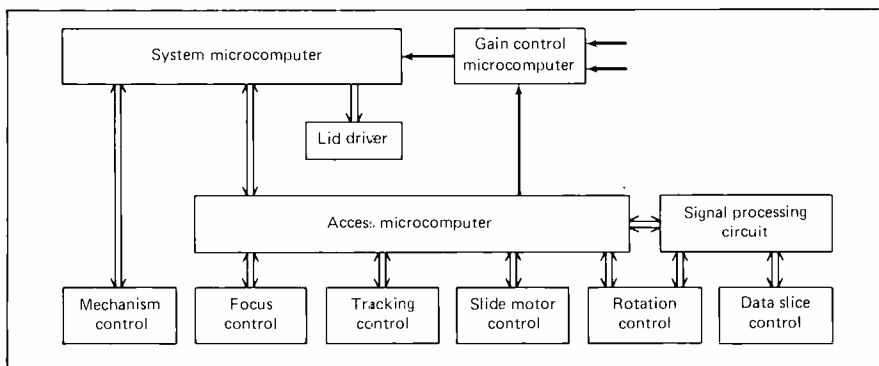


Figure 3. Microprocessor control of the Hitachi DA-1000 Compact Disc player.

per 40-pin package so that other features such as an internal clock may be included on the chip. When you include more on the chip, the total parts count of a system is smaller. And that means lower cost and a more compact package. Speaking of compact things...

### The CD Secret

Even at first glance, a Compact Disc player is a pretty amazing device. The sonic fidelity delivered by a player can be remarkable, and the longevity of the discs is astounding. When the engineering feats

other micros, and controls all signals and such as lid opening or closing and pickup location, as well as all input and output to the human user such as fluorescent and LED displays and user control inputs. The access microcomputer (HD44801A95) is a 42-pin chip controlled by the system computer that in turn handles all of the logic signal processing used for error detection and correction, and controls all of the servo systems in the player. The focus actuator coil, tracking actuator coil, slide motor, and disc motor are all controlled by the access computer; it checks for



# The Market Place

what's new in sound and music



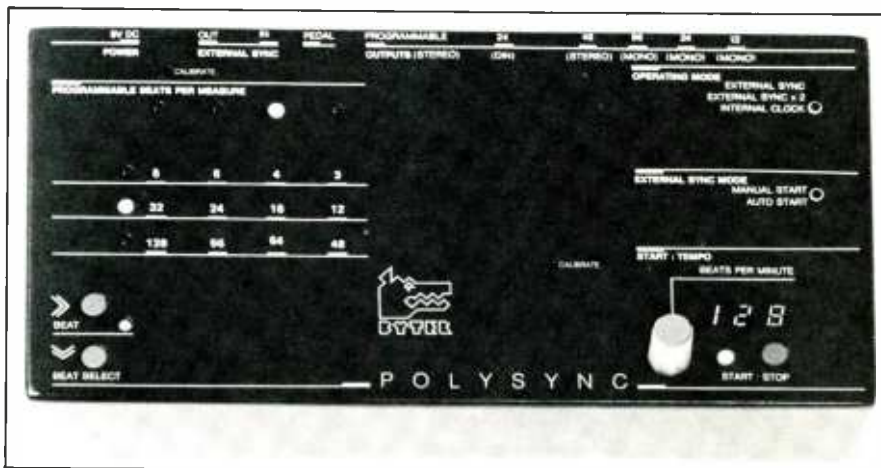
## CARVIN STUDIO GUITAR AMPS

The new Carvin X-30 and X-60 compact studio guitar amps evolved from their widely acclaimed 100-watt X-amps. The new tube amps deliver the same rich sustaining qualities and versatility at an even more affordable price. Their 18-inch width by 18-inch height offers easy portability while enclosing a powerful 12-inch Celestion G12M-70 or EVM-12L speaker. Featured in a 30- or 60-

watt RMS model, these amps incorporate state-of-the-art FET channel switching, active bass, mid, treble, and presence controls, and the Hammond reverb system. The 30-watt X-30 sells for \$329.00; the 60-watt X-60 for \$399.00.

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## BYTER RHYTHM CONTROLLER



## EDCOR POWER AMPLIFIER



Edcor's new GLA 60B is a 60 watt booster (power) amplifier with auxiliary level input. The outputs are 4-, 8-, and 16-ohm voice coil, and 25/70-volt constant voltage line. The GLA 60B has an effective logic protection circuit to assure long and reliable performance. Frequency response is 30 Hz to 20 Hz  $\pm$ 1 dB, and THD is less than 1 percent at full rated power.

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Byter's new Polysync rhythm controller makes it possible to synchronize the various clock rates of the different manufacturers' synthesizers, sequencers, arpeggiators, and drum machines. It is a valuable tool in performing, recording, and compositional and orchestration work. The unit operates as both a master clock and a clock processor, has a pulse shaper, and can sync to tape. Its features include an internal clock,

a beat meter with LED display, and complete portability. In addition, it has six fixed clock outputs, dual polarity variable clock outputs, auto reset, two external clock modes, and a foot pedal switch. Dimensions of the unit are 11 by 6 by 2 inches; it comes with a one-year warranty, and costs \$595.00.

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**FURMAN QUAD  
NOISE GATE**



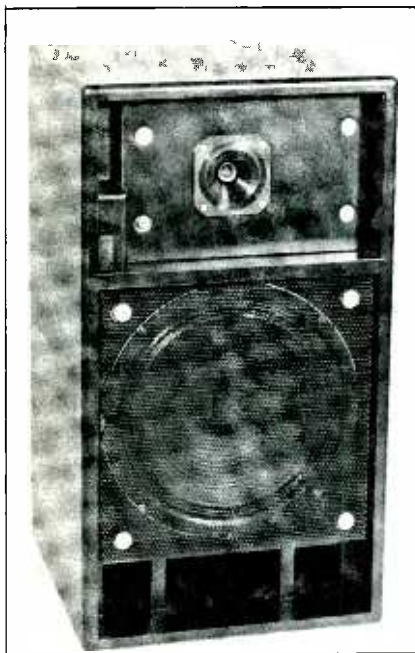
Furman Sound's newest product, the QN-4 Quad Noise Gate, employs sophisticated variable pulse-width modulation technology, providing

extremely low noise and superb frequency response specifications. The QN-4 features a fade time control for each of its four independent channels,

which allows the user to set the slope of the muting action—from a fast drop off to a gentle unobtrusive fade—to suit the program material. The device also contains extremely wide range threshold controls that enable it to function in a wide variety of applications and with almost any audio source. The unit carries a suggested retail price of \$395.00.

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**JOE'S SOUND &  
SALAMI CO.'S NEW  
MINI-MONITOR**



Joe's Sound & Salami Co.'s new Mini-monitor is a compact, highly efficient PA Monitor that combines precise acoustical alignment, remarkably small size, and the lowest cost in the company's line of monitors. The 12-MM can be retrofitted with the same components as the acclaimed 12SE Stage Eliminator. When you are ready to upgrade, cabinet replacement costs can be avoided with no sacrifice in quality.

*Circle 42 on Reader Service Card*

**SLM'S NEW  
ELECTRA PEDALS**

The Omni Division of St. Louis Music Supply Company is now offering its new second generation line of Electra Professional Effects Pedals. These new pedals contain improved, ultra quiet electronics for studio quality sound processing. Other notable features include an enlarged switch/trigger plate, easy access battery compartment, and a slightly larger base for improved stability. In addition, each pedal comes com-

plete with its own durable, padded storage pouch to protect the unit when not in use. Initially, seven models are available including a Stereo Chorus (Model #604CH), Stereo Flanger (Model #605F), and Distortion/Overdrive pedal (Model #600D). Suggested retail prices start at \$80.00.

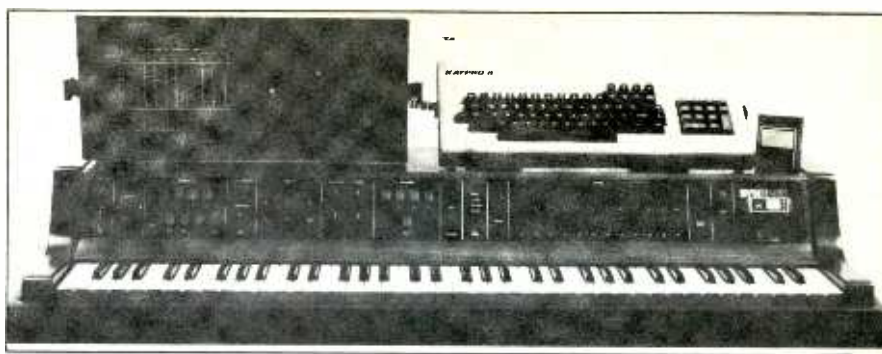
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## DIGITAL KEYBOARDS' NEW SYNTHESIZER

Digital Keyboards' new Synergy II Plus/GDS uses the same panel of controls as Synergy I, but has an additional set of hardware and software changes that provides the following new features: complete programmability and generation of sounds with the voicing software from the GDS and a recommended computer using CPM 2.2 operating systems; cartridge-arranging from the 600 sounds provided on disk; voice documentation software; RS-232C and programmable outputs to other devices like digital drum machines, light switches, etc.; MIDI In, Out, and Through; and Extended Programmer, which allows for on-stage call-up of 12 sets of four combined programs, and 12 4-track sequences. All are called up in real time from



the front panel, using a computer. Additionally, hundreds of musical features have been added, such as the ability to record both digital and analog information into the Synergy sequencer, multiple forms of compound transposition, and musician-oriented manipulation of the synthesis programs from the front panel. The Synergy II Plus/GDS is now the once \$30,000 General Development

System, brought into an expanded system for under \$7,500, including computer, a Kaypro II. Owners of earlier Synergy products can upgrade their instruments, as promised by the company, for appropriate costs. Cartridges are still available, along with other options.

*Circle 43 on Reader Service Card*

## ULTIMATE SUPPORT STANDS



Ultimate Support Systems' ProLine™ is a new series of black anodized aluminum support stands which includes tripods, keyboard stands, tables, and lighting trees for music and stage equipment. The black ProLine provides professional musicians with an attractive alternate to Ultimate Support Systems' popular silver stands. Like all Ultimate Support stands, ProLine products are constructed of aluminum alloy tubing with glass-reinforced polycarbonate parts for strong, lightweight support. Unique design features allow stands to be broken down and assembled quickly for true portability; adapters and options enable the same stand to accommodate a variety of equipment, for unmatched versatility.

*Circle 44 on Reader Service Card*

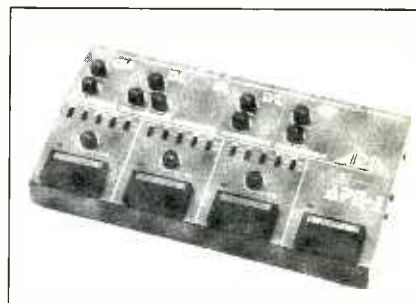
## PIGNOSE LEGENDARY



Pignose Industries' battery-operated Legendary is the first Pignose product available to the music and pro-sound industries. The Legendary is a practice amp, a studio amp, and a performing amp. Any instrument that can be amplified can be played through a Pignose, including your voice. This re-introduced Legendary Amp is as good as its ever been. Its looks and electronics (a thoroughly tested combination) have not been changed, and the cabinet is covered with the famous brown pigskin vinyl. Best of all, the original pig's nose is still used as the On/Off and Volume knob. The suggested retail price of the Legendary Pignose is \$99.95.

*Circle 45 on Reader Service Card*

## ARIA EFFECTS UNIT



Aria's new APE-1 is a programmable effects unit incorporating Compressor, Distortion, Delay, and Chorus. Unlike conventional multi-effects units, the APE-1 is equipped with three program channels that provide you with easy, one-touch selection. Each of the program channels contains an output level control. The APE-1 is equipped with an external effects loop that enables you to add existing effects to the APE-1 system. The Delay and Chorus are both enhanced with stereo outputs. Stable operation is achieved through an AC power source. Its compact size (13.4-in. wide by 2.8 in. high by 7.1-in. deep) and 5.1 lb. weight make it a valuable tool for the working musician. The unit carries a suggested retail price of \$369.00.

*Circle 46 on Reader Service Card*

# 1/4 Notes

## MAKING TRACKS

**George Benson** was recently at Grandslam laying tracks for his next Warner Brothers LP, with **Russ Titelman** producing and Elliot Scheiner at the board... **Let's Active** has finished their first full length LP, *Cypress*, for IRS at **Mitch Easter's** Drive-In Studios. Easter co-produced the album with **Faye Hunter**, **Sara Romweber**, and **Don Dixon**... **Roy Ayers** was at Unique Recording in New York laying tracks with **Grover Washington, Jr.** and **Tom Browne**, and mixing his debut album for CBS. **Stanley Clarke** produced the project with Jerry Solomon at the board. Steve Griffin and Kennan Keating assisted... At TNA Studios: **Cub Koda**, formerly of **Brownsville Station**, was in with his band recording three songs live onto two-track for his video presentation... **Plan 9** remixed several cuts and recorded a new song for their LP to be released on the New Rose label... **Teena Marie** was in laying down tracks and producing her next Epic record at Mad Hatter with Bobby Brooks co-producing and Gary Wagner at the board... **Steve Miller** was recently at Capitol Studios doing overdubs for his next record... **George Duke** and David Wolinski are producing **Shalamar's** next album for Solar... Madam X has been laying tracks at Cherokee with **Rick Derringer** producing and George Tutko engineering... **Triumph** was in working on their next RCA project at Metal Works in Toronto with co-producer Eddie Kramer and engineer Ed Stone... **Michael Urbaniak** recently recorded an LP at Dimensional Sound with Don Doyle producing... **The Reddings** were in recording at Bearsville Studios. Hubert Eaves produced the project with Mark McKenna at the board and Caryl Wheeler assisting... **Shelly Palmer** has completed a musical production for Pan Am's Europe/London campaign... At Bullet Recording in Nashville: **Shelley West** and **David Frizzel** have teamed up on a project for Warner Brothers. **Anne Murray** was in working on overdubs for her next album. Jim Ed Norman produced both projects with Scott Hendricks at the board. **Gail Davies** co-produced her upcoming album with **Lee Sklar**. **Bill Schnee** and Bob Sullock were at the board... **Barry Manilow** recently produced **Dionne Warwick's** next album for Artista Records at Sunset Sound in Los Angeles... **The Nails** were at Long Island's Boogie Hotel recording for RCA Records with Greg Winter producing and Michael Frondelli at the board... **Don Covay** recorded and produced his solo LP with Horace Ott. Steven Bramberg and Jeffrey Kawalek were associate producers of the project with Jim Sparling at the board... John Robie was recently at Greene Street producing a cut for **Laura Branigan**... **Joe South** finished mixing his latest album at Quadrasonic Sound in New York. Producers were John Hanti, Sandy Brown, and Matthew Kasha... **John Cale** mixed his new single at Planet Sound with Andy Heermans at the board and Tom Durack assisting... **Tina B of Rockers Revenge** has released the final tracks of her first LP for Elektra Records... Producer **Ivan Ivan** was recently at Unique remixing **Wire Train's** "Chamber Of Hellos" for CBS with Jay Burnett and Steve Pecorella engineering...

## ON THE ROAD

Let's Active left in early September with **Echo and the Bunnymen** for their fall tour of England and Scotland. When the two bands return, they will embark upon the first leg of their American tour... **Elton John** is currently in the midst of his "Breaking Hearts Tour" which covers 44 major cities in the U.S. and Canada... **Lee Ritenour** recently went on tour to promote his *Banded Together* album. His equipment for the stage monitor set-up is almost exclusively Fender Pro Sound...

## MISCELLANY

The **National Down Home Blues Festival** is scheduled for October 19 to 21 at the Moon Shadow Saloon in Atlanta, Georgia. The show will feature 25 acts, making it the largest country blues festival ever staged... "**Rock In Rio**," a 10 day musical festival featuring 14 major music groups, is to take place in January '85 in Rio De Janeiro... Guild Musical Instruments recently announced their newly formed association with **Queen** guitarist **Brian May**. The Brian May model #BHM-1 was introduced at the NAMM (National Association of Music Merchants) Show in Chicago...





**BRUCE SPRINGSTEEN: *Born In The U.S.A.*** [Produced by Bruce Springsteen, Jon Landau, Chuck Plotkin and Steve Van Zandt; recorded by Toby Scott; mixed by Bob Clearmountain; recorded at the Power Station and The Hit Factory; mixed at the Power Station; assistant engineers, John Davenport, Jeff Hendrickson, Bruce Lampcov, Billy Straus, and Zoe Yanakas; mastered by Bob Ludwig at Masterdisk.] Columbia QC 38653.

Performance: **Indelible**  
Recording: **Welded together**

After an acclaimed sojourn with a 4-track that produced the darkly introspective *Nebraska*, Bruce Springsteen returns to a larger sound without really relaxing into the comforts of a lush one. The dark cloud has lightened, but the tension that obscures a lighter-hearted sunniness with a lyric tone that ranges between grim nostalgia and despair takes the reins in simple arrangements and sparse instrumentation sporting only a few glimmering ornaments.

Reportedly gleaned from over 90 cuts, the 12 songs on *Born In The U.S.A.* reflect a purist's Americana—a “hey, baby” machismo that can't strut too far without revealing a potentially crippling vulnerability. The music, stalwart and straight-ahead rock 'n' roll, is for the most part subservient to Springsteen's semi-hoarse voice. The title cut is the most spacious, with a panoramic keyboard riff that doesn't let up and a thunderously full drum sound. The other accompaniments quickly slip into the background, are appropriately rollicking or delicate when necessary, and during breaks seem content to cover an open space without solos.

The two ballads are soft but hard-edged, portraying personal desperation and economic depression amid sweeter images, and yield the most unusual mixing techniques. In “I'm

On Fire,” the percussion is the property of one side of the mix, the finger-picked guitar belongs to the other. The synthesized strings of “My Hometown” come up verse by verse and gradually change from an embellishment to an entreating demand for contemplation. The strings finally rush up to cover the husband and wife who lay in bed and, like many of the characters of *Born In The U.S.A.*, half heartedly scheme to escape.

susan borey

**TINA TURNER: *Private Dancer.*** [Various producers, engineers, studios.] Capitol ST 12330.

Performance: **Seasoned**  
Recording: **Smart**

neer fails to understand and underscores the singer's strengths. For all of the factors to click, a recording demands an extreme amount of focus from all involved.

Focus is the last thing to be expected from *Private Dancer*. There are five producers, 18 songwriters, and a conglomeration of musical styles. To top that off, Turner's voice cracks and wavers throughout much of the LP. Yet, *Private Dancer* is still a first-class singer's album because of its sheer intelligence—in selection of material and producers—and in a new vocal display that alleviates any musical shortcomings.

Though Turner wants to emphasize rock 'n' roll at this point in her career, it was a cover of Al Green's soul classic, “Let's Stay Together,” that brought her back to the charts and made this album possible; vocally that tune is still the focal point of the



Sometimes singers' albums are the most difficult to make. If the voice is in shape, then the material doesn't challenge it enough. The producer doesn't always provide enough support, or he smothers the singer with support. Or possibly the engi-

album. Turner sings it exactly the way Green did, only when she hits some of the high notes a bit beyond her range, the engineer saves her by distancing her voice in the mix, then brings it back again to regain the intimacy of her lower range. Even

more infectious is the old Ann Peebles hit, "I Can't Stand The Rain," which sounds more modern, with synthesizers layered in short riffs. But when Turner warms to the infallible lyric and melody, she sings with just as much passion as Peebles did on the original. Turner deserves credit just for recording this song, which never got the attention it deserved when it came out in 1973.

Turner displays the same level-headedness in her choice and interpretation of rock material, which includes Bowie's "1984" and Chapman and Chinn's "Better Be Good To Me." Many of her previous rock outings have been marred by a manic pace that emphasized her hot-to-trot persona. Now Turner's voice is still as stinging, only producers Rupert Hine and Martyn Ware integrate it more into the rhythm tracks. On "I Might Have Been Queen," for example, she cuts into some tough, fast hooks, while just below the surface the bass sustains the momentum. Then, on the album's biggest surprise, Mark Knopfler's smoky, seven-minute title cut, Turner exposes some wistful, cynical phrasing, with the ripeness of a jazz singer who's sung in every cheap pub and cabaret on both sides of the Atlantic.

Turner scores points on every cut of *Private Dancer* because each one is contemporary and yet uncompromising. More importantly, her well-fought victory provides a lesson for the other great voices floundering of late, because she proves that the material, the producers and the engineers, are still there if you look hard enough.

rob hoerbarger

**PRINCE AND THE REVOLUTION: *Purple Rain*.** [Produced by Prince; assisted by David Leonard and Susan Rogers at the Warehouse, and by Peggy Mac and David Leonard at Sunset Sound; some cuts recorded live at 1st Avenue by David Rivkin, David Leonard and Record Plant, New York; originally mastered by Bernie Grundman.] Warner Bros. 25110-1.

Performance: **Sizzling**  
Recording: **Well done**

The soundtrack to Prince's ambitious venture into the rock movie field provides a convincing musical backdrop to the cinematic fleshing out of his psyche, and also offers

documentation of the artist's maturation—personally, musically and at the controls of the studio.

Perhaps with a film score in mind, Prince has pursued his most spacious musical seascape to date. With danceable beats, oh-so-catchy hooks and giddy energy, the territory he's won as pop-funk royalty hasn't shrunk; the view has just been broadened by more complex chord structures, drawn out endings, clever segues that insure continuity and a quantum leap in his skill at arranging strings.

The staple sound that holds most movie music together, strings, have become, in Prince's hand, tools wielded with a new confidence that permits a recessed, and thus more powerful position. On "Take Me With U," the strings are pulled back to atmospherocity to give the tambourine and acoustic guitar the aural limelight, but their smooth counter melody leaves the stronger impression. Complex melodies and dynamics characterize Prince's grasp on strings; he uses them as coy accessories, as in the strange tale of "Darling Nikki," and as heavy main material, as in the darkly pensive recession that closes the album.

With guitar parts that have developed past flashy spritz into orchestrated, harmonizing melodic breaks, Prince's musical development is also evident in his voice. The falsetto scream can still peel paint, but the voice is more controlled and lets the ornaments out of the bag more sparingly with heightened effect.

Recognition of techno-gimmickry is given little more than a nod. Loads of delay on "Computer Blue" turns the lead vocal into a duet, and backwards vocals appear un-Satanically on three songs.

A most interesting development on *Purple Rain* shows in Prince's attitude toward his trademark theme of sexuality. Of course there's the scandalous episode with a castle-couched queen of lust, Nikki, but generally the songs seem to delve into the pitfalls of love more than the pits of sensuality. "The beautiful ones hurt you every time," Prince has discovered; he entertains notions of marriage while dissecting unhappy unions into crying doves.

Known in his film as "The Kid," it looks as if Prince has grown enough to wear the title for the stylings of plot, not for the evidences of immaturity.

susan borey

**ELVIS COSTELLO: *Goodbye Cruel World*.** [Produced by Clive Langer and Alan Winstanley; recorded at Sarm West, London; mixed at Genetic Studios, Streatley.] Columbia FC 39429.

Performance: **Peerless**  
Recording: **Shiny**

With saucy sax and syncopation, *Goodbye Cruel World* is off to a misleading start, threatening to present more of the musically disjointed moodiness that offended Costello's last two releases. It changes key with the next cut, however, and returns to the kind of adulterated pop that elevated Elvis to his cynical yet sapient cloud above the other contenders.

The melodies are relentlessly persuasive here; their fluidity is accentuated by a usually dry treatment of Costello's voice that allows every nuance of genuine sweetness as well as the sung sneer to poke through the mix. On "Worthless Thing," the last phrase is delivered up close to the mic in a final sarcastic intimacy, like a signature on hate mail. Pushed by a crisp high hat, this song also is punctuated by an occasional dash of clean tambourine.

Costello calmly runs a gauntlet of emotions and musical styles, rocking back to the roots in "Sour Milk Cow Blues," doing rhythmic double-takes in the eerie reggae of "Room With No Number," spewing a calculated stutter in the barreling "Deportee's Club," and crooning with mournful sweetness through the droning "Love Field."

Costello always seems concerned with making his view fit into neat packages; excessive breaks and drawn out endings are rare. The man wants to get onstage, shoot the laser tongue through the velvet lips and jump out of the spotlight unscathed by vagrant vamps. A curious (and sole) exception on the album is found on "Room With No Number's" bouncy extended ending. Snatches of frantic silent movie piano run through the chorus with no less than 30 bars.

Taking aim at everything from the dirty politics of romance ("The Only Flame In Town," "Home Truth") to the dirty romance of politics ("Peace In Our Time"), this series of concise musical and moral statements is surely one of Costello's most appreciable efforts to date.

susan borey



**ELTON JOHN: *Breaking Hearts*.**

[Produced by Chris Thomas; engineered by Renate; mastered by Tim Young; recorded at Air Studios, Montserrat; 301 Studios, Sydney, Australia; and Air Studios, London, England.] Geffen 24031.

Performance: **Polished**

Recording: **Crisp**

Following *Too Low For Zero*, his first album since his most successful band reunited, Elton John's latest effort, *Breaking Hearts*, finds the artist contributing 10 new songs that prove he and Bernie Taupin still possess the chemistry to be tastefully innovative. With Davey Johnstone on guitar, Dee Murray on bass and Nigel Olsson on drums, John performs with the confidence and enthusiasm that was apparent on earlier efforts such as *Madman Across The Water* and *Captain Fantastic (And The Brown Dirt Cowboy)*.

Although the album lacks a great deal of orchestration and is far from being overproduced, it is not two-dimensional; many textures are audible under the production of Chris Thomas. In places where strings or organ would be used, the back-up vocals of Dee Murray, Davey Johnstone and Nigel Olsson add depth and a gospel feel, exemplified on the cuts "Burning Buildings," "Breaking Hearts" and the hit "Sad Songs." John's lead vocals are placed up front throughout the album, with a slight delay and very little reverb added, keeping them clean and uncrowded.

As a dominant instrument, the piano takes the spotlight at some point in about half the songs on this album. Where it appears as a solo instrument, it is used to its fullest dynamic capabilities and recorded with a bright yet full timbre. Where the piano is not the main instrument, it blends well with the others but lacks depth. Throughout the rest of the album the guitar is John's main accompaniment. Here Davey Johnstone's licks are clearly audible, with any added effects accenting his leads and harmonies. Besides electric guitar, a very expressive, clearly recorded acoustic guitar cuts through the mix in "Slow Down Georgie (She's Poison)."

Although the concept suggested by the title *Breaking Hearts* seems best expressed in the ballads on this disc, the cruelty and anger that accompany this theme are ade-



quately explored in the rockers that occupy the remainder of the album. The driving rhythms of Dee Murray and Nigel Olsson help achieve this, although in some spots the drums seem too laid back and lack the power achieved on earlier John recordings such as "Saturday Night's Alright For Fighting." *Breaking Hearts* is ample indication that the captain is still fantastic.

daniel schnatter

**JACKSONS: *Victory*.** [Produced by the Jacksons, David Paich and Steve Porcaro; various engineers and studios.] Epic QE 38946.

Performance: **Fragmented**

Recording: **Sterile**

The Jacksons as a group probably ceased to exist sometime after the *Triumph* album and tour in 1980-81. That was supposed to be the grand finale, before Michael went off on his own for good. But in the wake of *Thriller*, the brothers, including Michael and Jermaine, decided to get together one more time.

Except that the group never really comes together on *Victory*, whose eight songs each emphasize the singing and/or songwriting talents of a single brother. The problem is that beyond Michael, who whimpers

through one song and grunts through another, and Jermaine, who sings lead on half of one, the Jacksons individually are very average musicians. Gone from this album are the cohesive group harmonies, the playful exchange of leads, and the maturing songwriting that marked the group's work through *Triumph*.

The biggest waste on the album, musically and technically, is Michael's amorphous duet with Mick Jagger, "State Of Shock." The drums, which are meant to give the song its rock pulse, have neither a rim-shot edge nor an ambient snare sound; instead, they just lay there, with no spontaneity, and probably could have been recorded in several different parts and edited together. The two clashing voices eventually lead to a cacophonous mix. Michael's other song, "Be Not Always," is a treacly sermon that does have one brilliant engineering moment: the long silence toward the end that makes the song seem over before it actually is.

On "Torture," the bass takes the lead part, but it's just as languid as the drums on "State Of Shock." Michael and Jermaine share lead vocals, but the separatism of the album again takes precedence, as there is no vocal interplay between the two, and the harmonies are far too uniform. The bass bubbles a bit more on "Wait," with those famed

R&B veterans Toto chipping in, enough to make for a good Hall & Oates imitation. That Hall and Oates usually imitate groups like the Jacksons only makes "Wait" seem to be third generation soul.

The Jacksons sound like the old Jacksons only once—on Marlon's "Body," in which the call-and-response harmonies inject some spunk into the slightly tentative lead. But the song is just a musical rehash of "Wanna Be Startin' Somethin'" without the urgency. "One More Chance," a lightweight ballad by Randy, reveals some unpretentious charm, but overall *Victory* is just an expensive indulgence of six egos. There's probably no way the Jacksons could have lived up to the hype after the ridiculous success of *Thriller*. But once before they followed a monster album by Michael (*Off The Wall*) with a superlative album of their own (*Triumph*). That's the album that defines the Jacksons' sound of the '80s. *Victory* is just a reunion of name and album covers only.

rob hoerbuerger

**PETER CHEMIST VS. SCIENTIST:** *1999 Dub*. [Produced by Lincoln "Sugar" Minott and Peter Chemist; engineered by Soljje Hamilton; recorded at Channel One, Kingston, Jamaica.] Heartbeat 27.

**SCIENTIST:** *Scientist Encounters Pac-Man*. [Produced by Linval Thompson; engineered by Scientist; recorded at Channel One, Kingston, Jamaica.] Greensleeves GREL 46.

Performance: **Both LPs glide along smoothly**  
Recording: **World-class reggae engineering**

Very basically, dub is a process used in reggae music whereby the recorded tracks are stripped to basics, often leaving just the bass and drums, and then restructured with lots of reverb, additional rhythms and bits of voice, guitar, keyboards, and whatever. Admittedly, one must be totally enamored of reggae to enjoy intensive listening to dub recordings, but they also serve as fine dance music and harmless background music—those who don't particularly care for reggae's message might even prefer dub.

More importantly, dub is the art of reggae engineering taken to its limit.

The engineers who specialize in making dub recordings are stars in their own right, and none is held in higher regard than Scientist, a.k.a. Overton Brown. On these two recordings, Scientist's craft is presented at its best.

The Heartbeat album, *1999 Dub*, pits Scientist vs. newcomer Peter Chemist, but there is truly no contest. While Chemist (Peter Thompson) creates an enjoyable and mellow mix, his talent at this stage is rudimentary compared to Scientist's. The latter artist's mixes here are vibrant and melodic. Double-tracked drums and pulsating bass (courtesy of riddim masters Sly and Robbie) anchor the entire project, with occasional booms and buildups so powerful that one can literally be jolted by their arrival. Scientist knows enough about dub to avoid repetition (a common pitfall of this style), and where other dubmasters might allow the bass and drums to go on unaided for too long, Scientist always jumps to the rescue with a biting rhythm guitar passage or intensified percussion. The only unfortunate aspect of this recording is a disturbing amount of surface noise that detracts from the purity of the production.

Such is not the problem on the Greensleeves album (a division of Shanachie Records), which, like many other Scientist records, supposedly places the engineer in a mythical, comic-book-like battle against some other icon of the computer age, in this case Pac-Man. What that all has to do with the tracks themselves is debatable, because other than the occasional Pac-Man-like electronic noises Scientist throws in, this is reggae in its most organic state, with every little tick of the hi-hat and chunka-chunka of the guitar bouncing from left to right, recorded as crisply and fully as one could hope for. There are truly exciting moments on both of these records, and even non-fans of vocal reggae will want to give a listen to these largely instrumental works to check in on the advanced production and engineering techniques that are utilized every day in Kingston.

jeff tamarkin

**SONNY ROLLINS:** *Sunny Days Starry Nights*. [Produced by Sonny and Lucille Rollins; engineered by Richard Corsello; recorded at Fantasy Studios in Berkeley, CA.] Milestone M-9122.

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## The Infinite Varieties of Thelonious Monk

In all of jazz history, there has never been a tribute to a departed legend like *That's The Way I Feel Now* (A&M). Assembled by Hal Willner, the two-LP set includes singular versions of Thelonious Monk's originals not only by jazz players but also by an enthusiastic range of rock musicians who have been influenced by Monk.

The result is a wondrously heterogeneous, high-energy mosaic. Among the jazz contributors are such Monk friends and alumni as Steve Lacy, Charlie Rouse and Randy Weston, while, from the rock perspective, there are equally respectful and rollicking contributions by Dr. John, Todd Rundgren, Donald Fagen, Peter Frampton and Chris Spedding.

The instrumentations are intriguingly assorted—five French horns on one track; NRBQ and the Whole Wheat Horns on another; just a soprano and a tenor saxophone on yet another. The rock players here clearly understood what Monk was about because they clearly know how to play his tunes, and the jazz players extend themselves because that's what Monk's music does to you.

Hal Willner, who merits much credit for getting all these distinctive spirits together, says that

he never invited any musician twice. If the first response was not an immediate yes, Willner did not call back because he wanted everyone involved in this tribute to be delighted to be part of it. Including the engineer. And it all sounds just like that. All the colors—and there is an abundance of them—come through with equal clarity.

Meanwhile, as Willner's and other tributes to Monk are released, more and more of his own previously unissued performances are being made available. On Milestone, for instance, there is now *Thelonious Monk/Blues Five Spot*, eight previously unreleased club, studio, and concert performances.

The Five Spot was a club on New York's East Side where Monk flourished in the late 1950s. In addition to performances from there, there are two tracks from a Paris concert in 1961, and two studio sessions ("Coming On The Hudson" and "Played Twice"). It's all very much worth having. I have heard just about everything released by Monk; I spent many nights listening to him at the Five Spot; I worked with him during the rehearsals of the CBS-TV program *The Sound Of Jazz*. And I have never heard an

uninteresting Monk performance. Some may have been rather opaque, but none were dull.

As the music in this album makes clear, Monk, firmly rooted in stride piano and the blues, was one of the truly original jazz composers, building a body of work that was so unmistakably his own that for a long time, most musicians were afraid to try to put themselves into his tunes because they seemed so elusive, except to Monk. But now, younger players see his originals as among the universal classics of jazz, along with Ellington's and those of Charles Mingus. But Monk always knew his work was classic. The recorded sound throughout is good, sometimes better than that.

**CARLA BLEY, STEVE LACY, JOE JACKSON, PETER FRAMPTON, et. al.: *That's The Way I Feel Now/ A Tribute to Thelonious Monk*.** [Hal Willner, producer; engineer, Doug Epstein.] A&M SP-6600.

**THELONIOUS MONK: *Blues Five Spot*.** [Orrin Keepnews, producer; various engineers.] Milestone M-9124, distributed by Fantasy.

Performance: **The Sound Of Joy**  
Recording: **Muscular**

Saxophone colossus Sonny Rollins has had an ongoing love affair with Caribbean rhythms. Spirited, catchy calypso-flavored romps such as "St. Thomas," "Coconut Bread," "Little Lu" and "Don't Stop The Carnival" have become staples in the Rollins repertoire.

On his last Milestone album, *Reel Life*, recorded in 1982, Rollins continued that tradition with "Rosita's Best Friend," another islands-influenced number. In this latest Milestone release, the preeminent tenor voice of our time goes further into that idiom, lending his lusty, rough-edged sax sound to three more upbeat calypso numbers.

"Mava Mava," "Kilauea" and "Tell Me You Love Me" all carry the same buoyant, sprightly power of "Carnival," a classic set closer that Rollins

has relied on for some time. In the course of dishing out his catalog of trills, scalar runs, deep honks, slips, slides and squeals, the tenor man also serves up some irresistible good-time party music, making it both admirable and accessible. What comes across besides the sheer command of technique is a feeling of joy and an undeniable sense of humor in his playing. That is Sonny Rollins' legacy, not the lexicon of idiosyncratic sax tricks he has cultivated over the years.

The lovely ballad "Wynton," no doubt a tribute to the young trumpet sensation with whom Rollins toured last year, has a memorable melodic signature somewhat reminiscent of "I Can't Get Started." This gentle tune shows Rollins in a subdued mood, blowing sighs that blend beautifully with Clifton Anderson's melancholy trombone and Mark Soskin's tinkling celeste.

Demonstrating his seemingly inexhaustible store of ideas and his wide range of expression, Rollins moves into a straight-ahead affair on "I'll See You Again," overdubbing a second sax to create effective harmony lines. "I'm Old Fashioned" is another straight-ahead number featuring Sonny riding high over an uptempo groove supplied by drummer Tommy Campbell and bassist Russel Blake.

Rollins has shown that he's even at home with rock music, having played some fiery signature lines over the Rolling Stones' *Tattoo You* album. But whether it's rock, reggae, calypso, funk, ballad or an uptempo cooker, Rollins' fierceness and muscular determination cuts through, giving him perhaps the most distinctive and immediately recognizable voices in jazz today.

bill milkowski

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