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JULY 1984 VOL. 10-NO. 7 \$2.25

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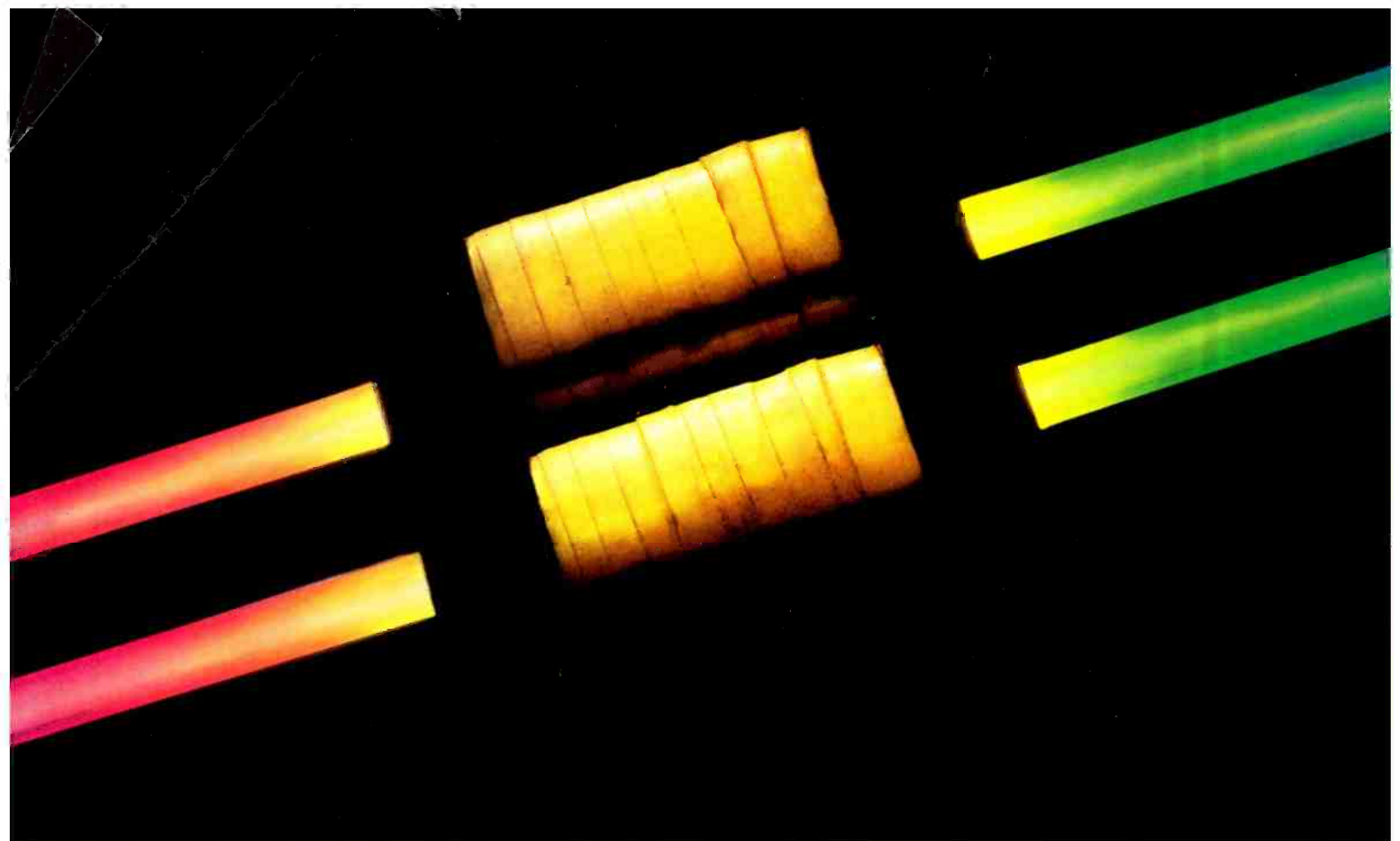
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Anthony Davis cover and inside color photo
Collis Davis
Bongos photo: Courtesy of RCA Records
Shelly Palmer photo: Cathy Miller
Band Next Door: Stephanie Berger



Round Two

In the January issue of *Modern Recording & Music*, Phil Cohen of Bay Harbor, Florida, took issue with several points I raised in my review, "The Beatles: Releases by Mobile Fidelity and Others" (September 1983), and undertook to "set Mr. Kozinn and readers straight about why there are no LPs of new EMI Beatles material." Unfortunately, while Mr. Cohen raised some interesting points, he not only failed to set the record straight, but contributed a good deal of misinformation to the argument.

Mr. Cohen's main point—that EMI would not issue anything that has not been published by a publishing company, partly because of contractual tangles that would obligate the Beatles and heirs to increase the value of a catalogue that they do not own but which they are currently seeking to buy—makes a great deal of sense, and tallies with other reports I've heard. But complicated as all that sounds, I have to say that, ironically, it's not that simple: Every year, EMI admits to having "just discovered" a number of finished Beatles tracks. Most recently, these discoveries included four tracks: "How Do You Do It," "Leave My Kitten Alone," "That Means A Lot" and "If You've Got Troubles." The first two, it should be noted, were also "just discovered" in 1980, as was an early (1963) version of "One After 909," a track the group remade during the *Let It Be* sessions, six years later. In announcing its most recent find last summer, EMI dropped "One After 909" from the list—although it did include the track of its special Beatles presentation at the Abbey Road studios.

As Mr. Cohen points out, two of these five finished studio productions were not Lennon-McCartney originals ("Kitten" and "How Do You Do It") and could therefore be released without any problem. Indeed, those two tracks were scheduled for release as a single in December 1980, but when John Lennon was shot, EMI decided to shelve the single so as not to appear mercenary. Similarly, the release of "One After 909"—a tight, hard-rocking version that nicely complements the later one and shows something of the band's stylistic development over the years—would not add a new title to the Northern Songs publishing catalogue.

Nor, for that matter, would the release of "That Means A Lot," or indeed, many other unreleased Lennon-McCartney gems; contrary to Mr. Cohen's belief, those songs *were* published by Northern Songs. "That Means A Lot" was published in 1965, when P. J. Proby released his recording of it. I've heard the Beatles' original: It is a finished studio recording, with vocal harmonies typical of the period and a rhythm track similar in some respects to that of "Ticket To Ride." It is infinitely superior to Proby's, and even in terms of the Beatles' "official" output, it is by no means an embarrassment.

"If You've Got Troubles," on the other hand, is less than top-drawer Beatles material. Dating from the *Rubber Soul* sessions, it would seem to be a Ringo Starr original. At any rate, Starr sings it, and the lyrics—which include the couplet, "You think I'm soft in the head/Well try someone softer instead"—is

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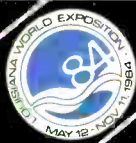
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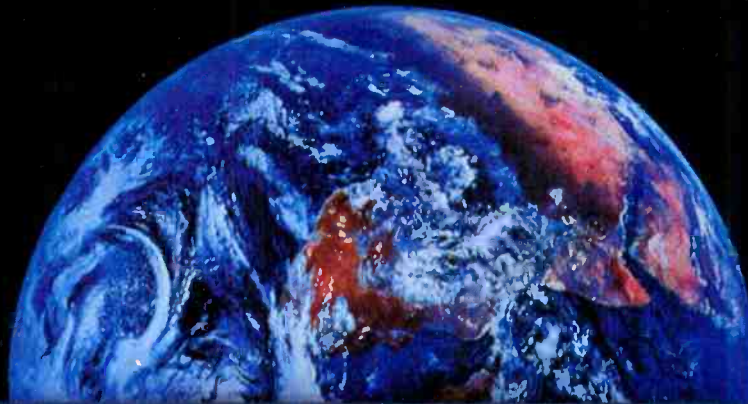
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certainly not up to the Lennon and/or McCartney standards of the period. Yet, of all the tracks mentioned so far, only this one runs up against the publication problem—and as a Starr original, rather than a Lennon-McCartney original, the matter of whether Northern Songs has first publication rights may be arguable.

At any rate, the existence of "That Means A Lot" helps bring to light a number of exceptions to Mr. Cohen's "published song" theory. Namely, it is but one of nearly 20 songs that Lennon and/or McCartney gave to other performers. In some cases (as in "That Means A Lot") they were left-overs from sessions that had already produced a 14-song LP plus a non-LP single. In other cases, these were early originals that Lennon and McCartney had surpassed with more recent songs by the time they made it to the recording studio. And some of these tunes were written with specific performers in mind—fellow Epstein managees early on, and Apple artists later, with a few non-aligned friends in between. Quite a few of these songs, plus a few post-breakup songs written by single former Beatles for other performers, are included on an interesting EMI compilation called *The Songs The Beatles Gave Away* (EMI 5C 038-07003).

Since the Beatles did not write musical notation—and since, in most cases, the groups that recorded these Lennon-McCartney tunes did not read music—the songs were conveyed aurally; that is, via a demo tape. Granted, the performances recorded strictly as demos are not always finely polished. The demo for "Bad To Me," for instance, is a rough but by no means sloppy account, with the Beatles playing acoustic guitars, and Lennon singing lead. They are not the same sort of detailed productions as, say, Peter Townshend's Who demos, but for the same reason Townshend's demo tapes proved fascinating when released to the public, the release of unpolished Beatles demos would undoubtedly come as a treat to Beatles collectors who, after all, remain a significant force in the LP market.

The demo business opens the field for yet another side of the unreleased Beatles catalogue that skirts the publication issue: At the Abbey Road exhibition last summer, EMI put together a 90-minute film presentation that included, in its soundtrack, a handful of familiar Beatles tunes in entirely unfamiliar arrangements.

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As the group became more comfortable in the studio, they would try out their new songs in a number of guises—hard rocking, country & western, and whatever else seemed plausible for a given tune—eventually deciding on one version and polishing it. Some of the versions played at Abbey Road are fascinating, the best being a selection of different views of “Strawberry Fields Forever” and an acoustic guitar version of “While My Guitar Gently Weeps” (the latter including a verse that was dropped from the finished version). For Beatles collectors confronted with compilation after compilation of previously released material, an LP of familiar songs in unfamiliar performances would be a breath of fresh air.

All of which brings us to Mr. Cohen’s last point, about the original version of the *Get Back* LP. Mr. Cohen is correct in guessing that it sounds rougher than the Phil Spectorized *Let It Be*; but that was the *point* of the project. When the Beatles released their first single from these sessions, “Get Back,” they advertised it (in British music publications) with the slogan: “The Beatles as Nature Intended”—that is, in an uptempo rocker recorded virtually live in the studio, polished perhaps, but without layers of overdubs, electronics or (with the exception of Billy Preston’s keyboards) “foreign” instruments. Now, leaving the intentions of nature aside, the original *Get Back* LP was what the Beatles intended; what Mr. Cohen reads as disappointment with that LP was undoubtedly colored by the acrimony of the sessions themselves, rather than the fact that the disc has a raw, unpolished sound.

Moreover, Mr. Cohen is substantially misinformed about what was on the *Get Back* LP. According to his letter, that LP contained the full-length “Dig It” and Beatles-only “Long And Winding Road,” plus “alternate mixes of cuts that sound only minimally different from the released versions,” plus “Teddy Boy,” the 45 rpm versions of “Get Back” and “Let It Be” and the original “Across The Universe” (the one subsequently issued on the *Rarities* LP). Well, not quite. First of all, the versions of “Get Back” and “Let It Be” are different takes, not the 45 rpm versions—nor, for that matter, are they the same versions used in the film or in the Spector-produced LP. The other tracks were not alternate mixes, but different takes, some of

them substantially different from those on the *Let It Be* LP; in only one case (“I’ve Got a Feeling”) was Spector’s choice of takes actually better or more complete than the one on the original.

There is some other reshuffling involved in Spector’s version: A short version of the Drifters’ “Save The Last Dance for Me” and an unnamed instrumental jam were dropped, as were a few of the false starts and some of the studio chatter that gave the *Get Back* LP much of its charm. And two songs that were worked on during the sessions, but not included on *Get Back*—“I Me Mine” and “Across The Universe”—were added by Spector. The original version of “Across The Universe” was by no means part of the *Get Back* package. It was recorded at the same time as “Lady Madonna,” and nearly released then as a single. When “Lady Madonna” was released instead, “Across The Universe” became one of those “leftover” tracks I mentioned earlier. It was finally released not on an official Beatles LP, but on a charity disc coordinated by George Martin in 1969.

For someone obviously as interested in the problem of unreleased Beatles material as Mr. Cohen, his confusion about the *Get Back* LP is surprising, since its original form is hardly a mystery. When the LP was compiled, *Beatles Monthly* published a track-by-track account (in the proper running order, and quite detailed) of the disc’s contents, just as the magazine had done with the preceding LPs. A stereo acetate copy of the disc then went out to radio stations, including several in the United States. Those were the days when FM stations had no qualms about playing new discs, particularly Beatles, Dylan and Stones LPs, start to finish as soon as they arrived; and when they did, virtually every kid with a tape recorder got the *Get Back* album down on tape. Eventually, copies of the acetate itself made the rounds, and the original *Get Back* album is now the most common of Beatles bootlegs.

As you see, EMI has recourse to lots of material that could be released without coming into conflict with the publishing question, and it would be wonderful if they’d get around to releasing some of it. But actually, to most hardcore Beatles fans, it doesn’t matter whether they do or not, because whatever EMI won’t put out, bootleggers will, or already have. And

lately, bootlegs of studio material have been of surprisingly high quality; so collectors who want this material can find it, one way or another.

—ALLAN KOZINN
New York, NY

There’s Always Room For One More

I’ve recently discovered your magazine through a friend, and have been very impressed with the technical, practical, and down-to-basic information in each issue.

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I’m looking forward to joining the ranks as a monthly reader.

—GEORGE M. CULBERTSON
Charlotte, NC

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—MAURICE SMEETS
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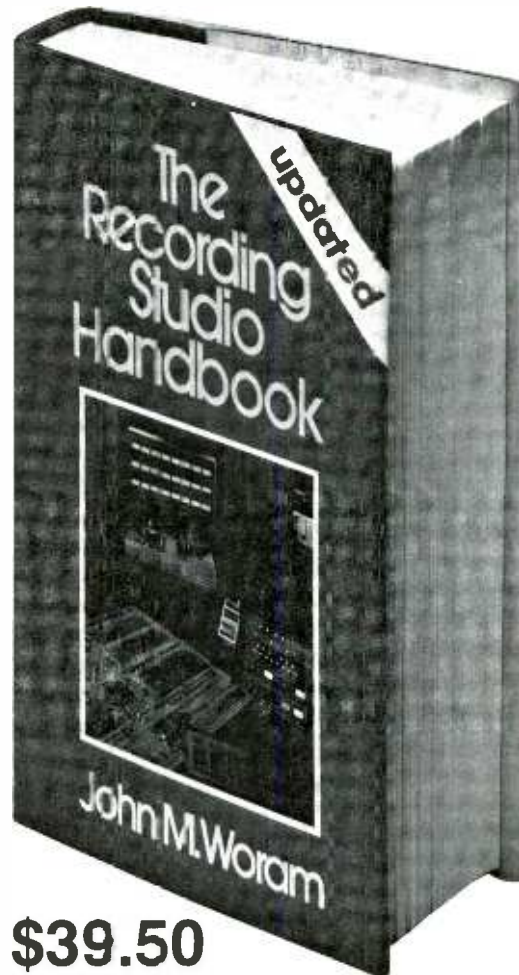
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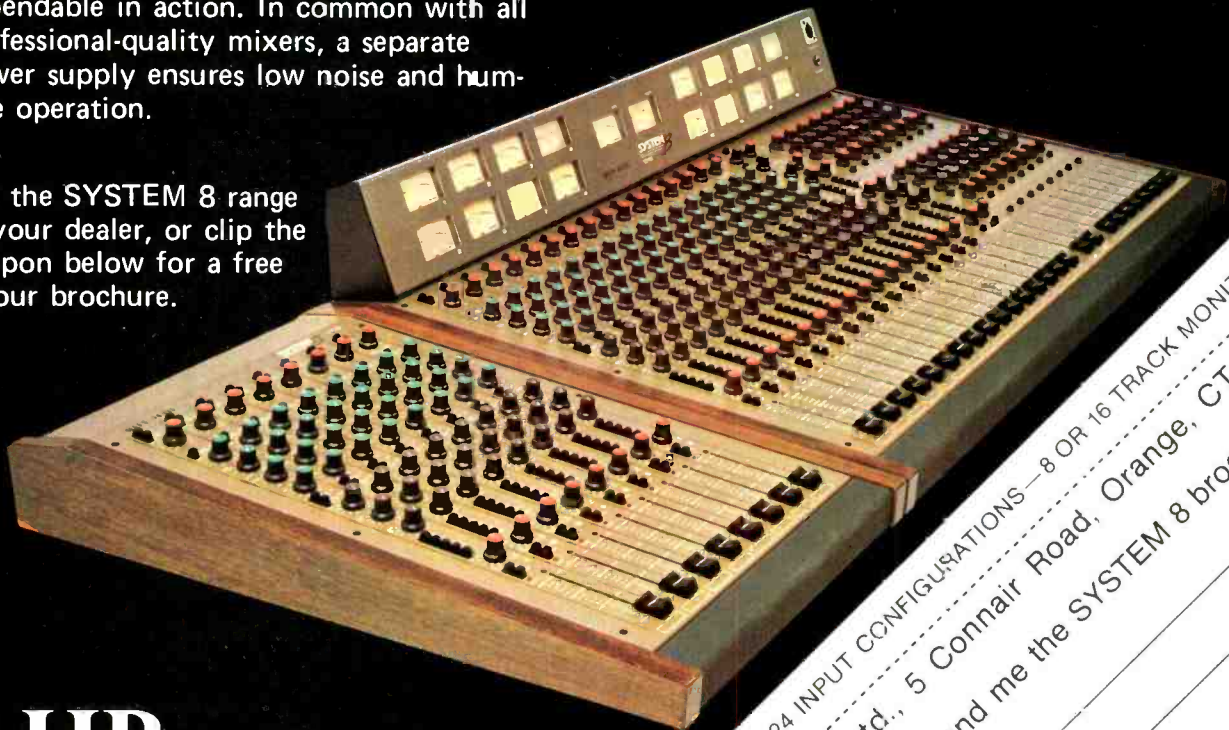
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Talk Back

So Do We Have A Deal?

Could you tell me if the following equipment is good for a "basement" studio and if it would be adequate for master recording as well as demo recording?

- Fostex A-8 recorder.
- Teac model 5 8/4 mixing console, expanding to 20 channels.
- Patch cords and a small patch bay.
- A few Shure Bros. SM57 microphones.

My concern is that the recorder can only take 7-inch reels (it's also biased to Ampex 456 tape). I can get all this equipment as a package deal for a good price, but I would like to know if it's a worthwhile investment?

—COLIN CARYK
Spirit River, Canada

We received the following reply from Bruce Bartlett.

Yes, it's a worthwhile investment. That equipment is adequate for a basement studio and for demo recording, if you add the following equipment: some good condenser microphones, a 2-track tape machine, a direct box, a reverb unit, a microphone snake, mic stands and booms, a power amplifier, some accurate monitor speakers, some cue headphones, and an editing block. A delay unit and a compressor would help, too.

As long as you don't record concerts on location, a 7-in. tape reel provides enough recording time for a few tunes (22½ minutes with 1800 feet of tape at 15 ips). If you record many retakes, you'll change a 7-in. reel twice as often as a 10½-in. reel.

With this minimal equipment, you probably can't compete with 16- or 24-track studios. But with attention to detail, more types of microphones, quality outboard gear, and good studio acoustics, the sound quality could be adequate for occasional master recordings.

S.O.S.

I have a lot of recording gear, but don't have a lot of space to put it in. The problem is that none of the standard rack-type enclosures on the market will fit my requirements; and having them fabricated would cost lots of money—unless I could build them myself. Are there any books or articles on the subject of custom-building audio installations (not decorative hi-fi setups, but recording studio-style racks)?

—GLENN SCOTT
Los Angeles, CA

We sent this urgent request to our crack detective Jim Rupert. Below is his (helpful?) reply.

Well, Glenn, I'm shooting blanks so far today. Not only can't I find any literature on building custom studio racks, but when I tried to contact a couple of companies which I'd seen advertising specially-built studio shelving/racks I learned they had gone belly up some time ago.

Can any *MR&M* readers help both Glenn and myself out on this one? If any of you can supply us with ideas and/or information sources on the subject of building studio-style racks, please drop us a line at the *MR&M* editorial offices. That way we can share your suggestions with everybody.

In the meantime, Glenn, send me complete details on your equipment and your studio space limitations and I'll see if I can have any better luck at the drawing board than I've had on the phone this morning. We'll make it all fit. Okay?

Practical Advice

I am just getting started in multi-track recording and have recently gone from a Portastudio to a full 8-track system. Of course, the change in equipment seems very radical to me.

My question for you is: Is it absolutely necessary to use noise reduction? If so, what type do you recommend? I know how good dbx is, but they no longer make the DX-8 that is compatible with my Teac 80-8.

Also, would I get better mixes if I went to a Tascam M50 board instead of my current model 5? The only mics I own are Beyer Dynamics.

—DAVE
Kracker Box Recording
S.L.C., UT

Once again, we returned to the inimitable Jim Rupert for the scoop.

Well Dave, when you're right, you're right. The DX-8 is no longer being made and the new DX-4 units are not compatible with the older model 80-8 that you have. In order to get the simultaneous encode/decode function you'll need for monitoring, you'll have to either use four two-channel "regular" dbx units or else hit the product suppliers around the country to see if anybody still has a new (or possibly even used) DX-8 left in stock. (The latter suggestion would be the most economical way to go.)

No, I don't feel noise reduction is *absolutely* necessary. However, on a limited width tape format like the 80-8's ½-inch eight-track configuration, I think it's a damn good idea. Remember, this is called *semi-pro* equipment. Noise reduction, especially as effective and relatively inexpensive as dbx, is just one more aid in the holy quest for the last dB of perfection.

As regards the M50 vs. the Model 5, I don't believe you'll hear a huge difference in your mixes with the newer model mixer. The M50 offers some nice advantages and conveniences over the Model 5, but I sense that any dissatisfactions you have with your mixes are the result of just not having worked with the board

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long enough to master the best ways to use it during recording and mixdown yet. I've heard recordings made on 80-8 and Model 5 interfaces that any engineer in the world would be proud of. With practice, creativity and a little experimenting, I'm betting that you'll feel the same way about your recordings. If the money for a new mixer is burning a hole in your pocket, then by all means take the plunge. But first I'd recommend having the patience to hone your skills to the point of bringing your talents up to the level of your current equipment. When your engineering skills are good enough to have exhausted all the possibilities of your Model 5, a better mixer might be a more natural step. (Wouldn't it be a bite to spend the extra money for a new console only to discover you still don't like your mixes?)

After you've worked with your equipment for a few more months, write us back and let us know how things are going for you and your studio. In the meantime, the best of luck to you and your recording career.

Go Straight To The Source

I am presently in the process of

building a sound recording studio in my home and I'm having trouble finding information on sound proofing and what type of equipment would be best for my needs.

I've read about the EVT 5212 stereo mixer and would really like to use it in my studio. If there is any information you could send me on the EVT 5212, and the systems that would blend best with its capabilities, I would greatly appreciate it.

Any information on how to soundproof the room would also be very helpful.

—JOE BECKETT
Reading, PA

The guy's on a roll, so back to Rupert we go.

Joe, we'd love to send you some information on the Electro-Voice Model EVT 5212...however, we don't have any. Instead of writing to us it's always better to go straight to the manufacturer for product info. In this case, contact Greg Hockman, Director of Marketing, Musical Products, Electro-Voice Inc., 600

Cecil Street, Buchanan, MI 49107. If for any reason you ever have difficulty getting a response from any company on a request for product information, drop us another line and *MR&M* will try to shake their tree for you, okay?

Some healthy soundproofing hints should have been obtained from the recently printed designs from the Design-A-Studio Contest. For more detailed help, we'd recommend two books: "How To Build A Small Recording Studio From Scratch... with 12 Tested Designs" by F. Alton Everest and "Building A Recording Studio" by Jeff Cooper. Mr. Everest's fine book can be ordered from TAB Books Inc. in Blue Ridge Summit, PA 17214. Mr. Cooper's volume has been in and out of print for the last few years but at the time of this writing can still be ordered from Mix Bookshelf, 2608 Ninth St., Berkeley, CA 94710. If you're considering a sound studio in your home, both of these excellent publications ought to be in your audio library. Also, pick up a copy of *db* magazine and check out the books available to order through Elar Publishing while you're at it. You'll be glad you did! Write to *db* at 1120 Old Country Rd., Plainview, NY 11803.

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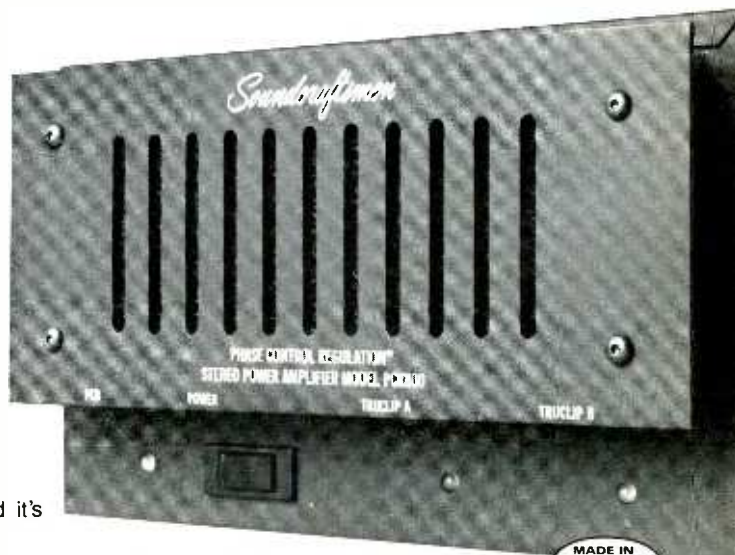
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Recording Techniques

bruce bartlett

dB or not dB

Confusion runs rampant when it comes to decibels. How is a dB different from a dBV or a VU? How do you compare component levels? How do you compare microphone sensitivities? In this article we'll try to clarify these subjects. The reading involves a little math, but it is essential if you want to be knowledgeable about this aspect of audio. Even experienced professionals may find some surprises here.

Basics

First, let's define the term "level" as used in a recording studio. Originally, "level" meant power, while "amplitude" referred to voltage. Today, the term "level" is used to denote voltage or sound pressure, although the terminology is not entirely correct. Still, it is important to understand both definitions in order to communicate.

Audio level is measured in decibels (dB). The original, classic definition of decibel was: 10 times the logarithm of the ratio of two power levels, or:

$$\text{dB} = 10 \log(P1/P2)$$

These days it's common to use "dB" to refer to voltage ratios as well. Hence, the following formula:

$$\text{dB} = 20 \log(V1/V2)$$

One dB is the smallest *change* in level that the human ear can hear—the just-noticeable difference. Actually, the just-noticeable difference varies from 0.1 dB to about 5 dB, de-

pending on bandwidth, frequency, program material, and the individual. But 1 dB is generally accepted as the smallest change in level that most people can hear.

Sound pressure level, signal level, and change in signal level are all measured in dB. Let's look at each of these.

Sound Pressure Level

Sound pressure level is the pressure of sound vibration, measured at a point. It's usually measured in dB SPL (decibels of sound pressure level).

The higher the sound pressure level, the greater the perceived loudness (see *Figure 1*). The quietest sound we can hear, the threshold of hearing, is 0 dB SPL. Average conversation at one foot is to 70 dB SPL. The average home-stereo listening level is around 85 dB SPL. The threshold of pain—so loud that the ears hurt—is 125 to 130 dB SPL. A 10 dB increase in SPL is considered by most listeners to be twice as loud.

Sound pressure level, in decibels, is 20 times the logarithm of the ratio of two sound pressures:

$$\text{dB SPL} = 20 \log P/P_{\text{ref.}}$$

where:

P = the measured sound pressure in dynes/cm² and

P_{ref.} = a reference sound pressure: .0002 dyne/cm² (the threshold of hearing).

Signal level

Signal level is also measured in dB. Signal level, in decibels, can be expressed in various ways:

dBm or dBl: decibels referenced to 1 milliwatt.

dBu or dBv: decibels referenced to .775 volt.

dBV: decibels referenced to 1 volt.

Let's explain each one of these.

If measuring signal power, the decibel unit to use is dBm.

$$\text{dBm} = 10 \log P/P_{\text{ref.}}$$

where:

P = the measured power and

P_{ref.} = the reference power, 1 milliwatt.

For example, let's convert .01 watt to dBm:

$$\text{dBm} = 10 \log P/P_{\text{ref.}} \approx 10 \log .01/.001 = +10$$

So, .01 watt is 10 dBm (10 decibels above 1 milliwatt).

Now let's convert .001 watt to dBm:

$$\text{dBm} = 10 \log P/P_{\text{ref.}} = .001/.001 = 0.$$

So, 0 dBm = 1 milliwatt.

Any voltage across any resistance that results in 1 milliwatt is 0 dBm.

$$0 \text{ dBm} = V^2/R = 1 \text{ milliwatt}$$

where:

V = the voltage in volts and

R = the circuit resistance in ohms.

For example, .775 volt across 600

Just The Right Mix

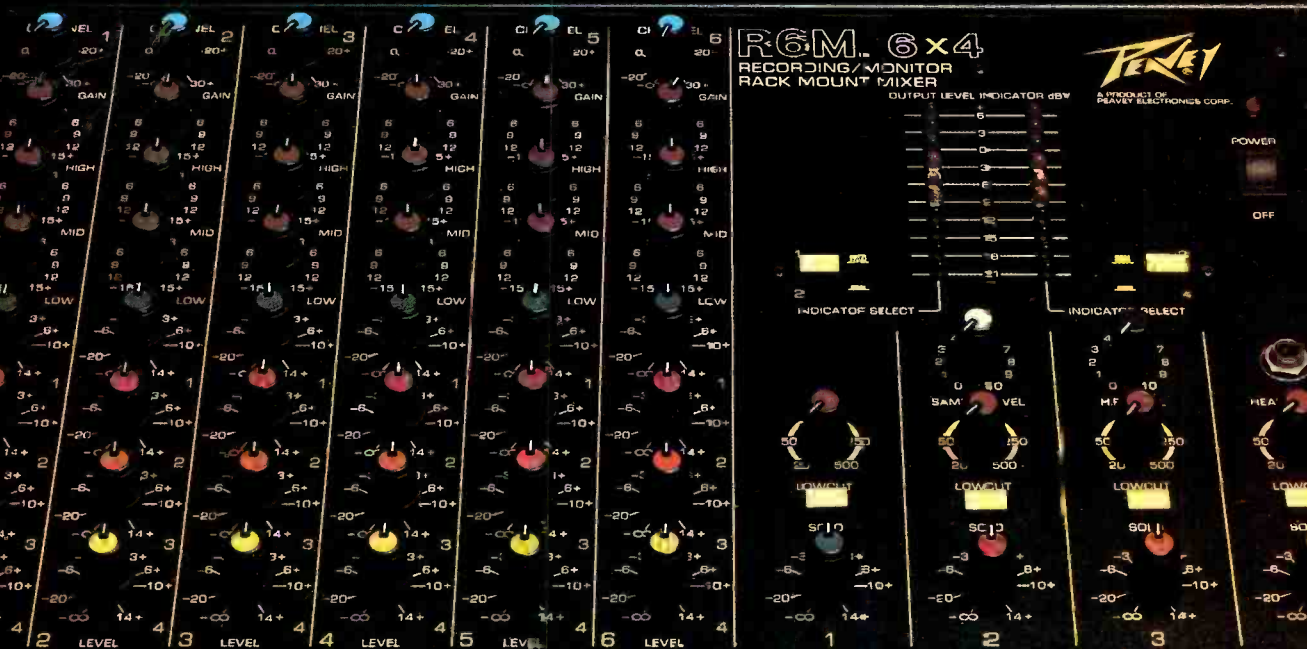
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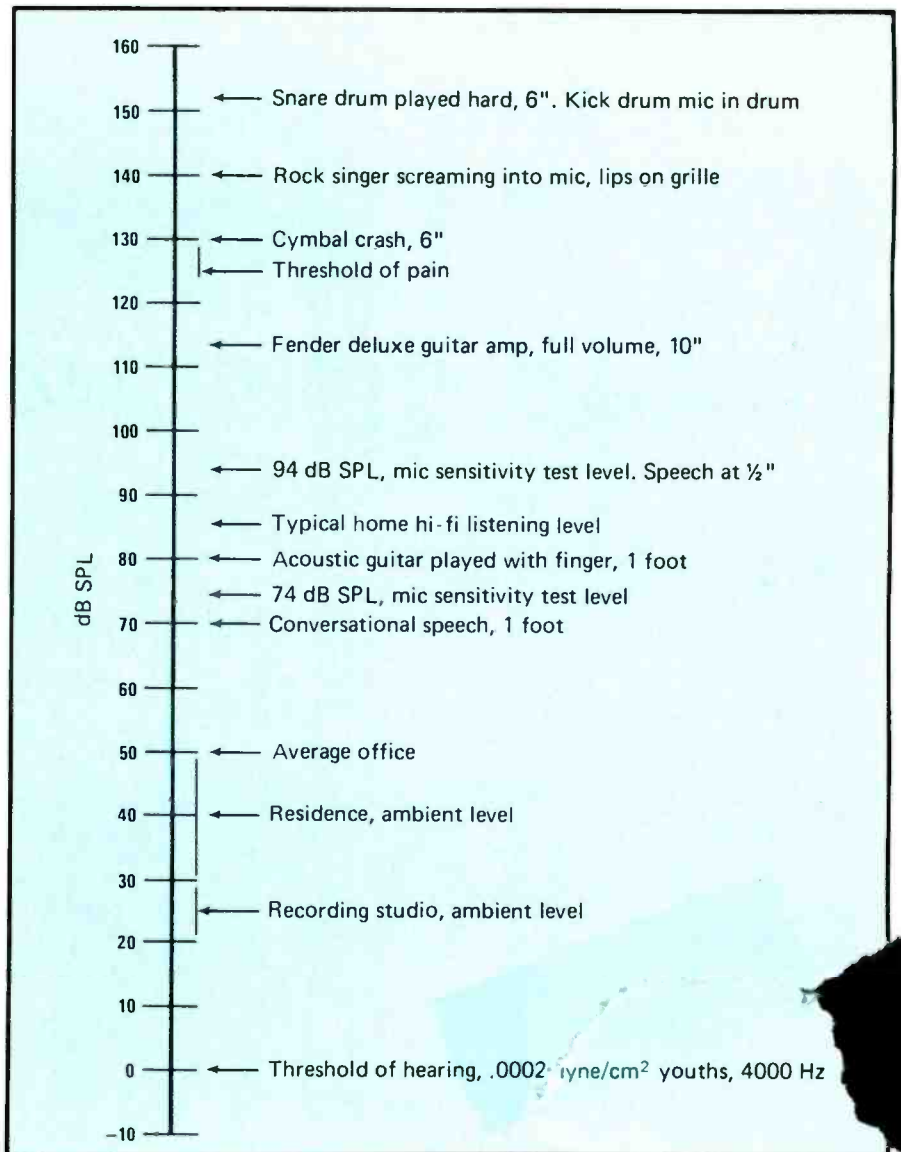


Figure 1. Chart of Sound Pressure Levels.

ohms is 0 dBm. One volt across 1000 ohms is 0 dBm.

Some voltmeters are calibrated in dBm. The meter reading in dBm is accurate only when measuring across 600 ohms. For an accurate dBm measurement, measure the voltage and circuit resistance, then calculate:

$$dBm = 10 \log \frac{V^2/R}{.001}$$

Another unit of measurement is called dBv or dbu. This means decibels referenced to .775 volt. The ".775 volt" figure comes from 0 dBm. 0 dBm = .775 volt across 600 ohms, where 600 ohms used to be a standard impedance for audio connections.

$$dBv = dBu = 20 \log V/V_{ref.}$$

where:

$$V_{ref.} = .775 \text{ volt.}$$

Signal level is also measured in

dBV, or decibels referenced to 1 volt.

$$dBV = 20 \log V/V_{ref.}$$

where:

$$V_{ref.} = 1 \text{ volt.}$$

For example, let's convert 1 millivolt to dBv:

$$dBV = 20 \log V/V_{ref.} = 20 \log .001/1 = -60$$

So 1 millivolt = -60 dBV (60 decibels below 1 volt).

Now let's convert 1 volt to dBV:

$$dBV = 20 \log 1/1 = 0$$

So 1 volt = 0 dBV.

To convert dBV to voltage, use the formula

$$\text{volts} = 10^{\frac{dBV}{20}}$$

Change in signal level

Decibels are also used to measure the change in power or voltage across

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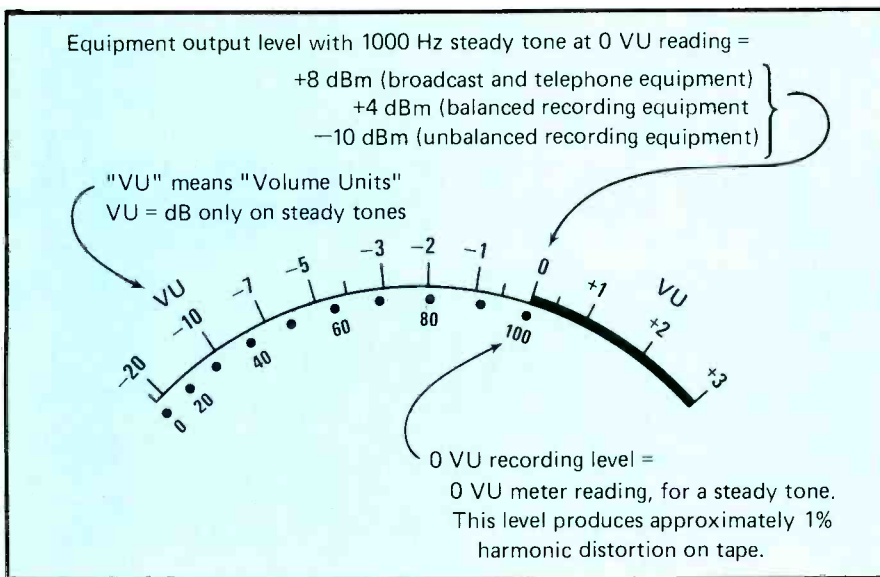


Figure 2. VU meter scale.

a fixed resistor. The formula is:

$$\text{dB} = 10 \log P_1/P_2$$

or

$$\text{dB} = 20 \log V_1/V_2$$

where P1 is the new power level and P2 is the old power level; V1 is the new voltage level and V2 is the old voltage level.

For example, if the voltage across

a resistor was .01 volt, and it changed to 1 volt, the change in dB is

$$\text{dB} = 20 \log V_{\text{new}}/V_{\text{old}} = 20 \log 1/.01 = 40.$$

So the change in voltage is 40 dB.

Doubling the power results in a 3 dB increase; doubling the voltage results in a 6 dB increase.

Summary:

$$\text{dB SPL} = 10 \log P/P_{\text{ref.}}$$

where

$$P_{\text{ref.}} = .0002 \text{ dyne/cm.}^2$$

$$\text{dBm} = 10 \log P/P_{\text{ref.}}$$

where

$$P_{\text{ref.}} = 1 \text{ milliwatt.}$$

$$\text{dBV} = 20 \log V/V_{\text{ref.}}$$

where

$$V_{\text{ref.}} = 1 \text{ volt.}$$

$$\text{dBu} = 20 \log V/V_{\text{ref.}}$$

where

$$V_{\text{ref.}} = .775 \text{ volt.}$$

$$\text{dB} = 10 \log P_1/P_2 = 20 \log V_1/V_2.$$

The VU Meter and 0 VU

A VU meter (originally called VI meter) is a voltmeter of specified transient response, calibrated in VU or "volume units." It shows approximately the relative volume or loudness of various signals.

The VU-meter scale is divided into volume units, which *are not necessarily* the same as dB. Volume Units = dB *only* with steady-state sine wave tones. That is, 1 VU = 1 dB only when a steady tone is applied. When transients or complex waveforms are measured on a VU meter, the marks on the meter scale do not correspond to dB.

A zero meter reading is usually called "0 VU," although this definition is not completely accurate. "0 VU" refers to a level, not a meter reading. Still, you have to know both definition to communicate.

By "0 VU," most recording engineers mean a 0 reading on the VU meter. When the meter on your mixer or recorder reads "0" on a steady tone, your equipment is producing a certain level at its output. Different types of equipment produce different nominal levels when the meter reads "0," as shown below and in *Figure 2*:

Broadcast and telephone equipment:
0 VU reading = +8 dBm.

Recording equipment (balanced):
0 VU reading = +4 dBm.

Recording equipment (unbalanced):
0 VU reading = -10 dBV.

When a tape operator says to a mixing engineer, "Send me a 0 VU tone," he or she means, "Send me a tone that reads 0 on your VU meter." The actual level isn't too important, because the engineer receiving the tone just wants to calibrate his or her equipment (by setting the tone to a 0 VU meter reading).

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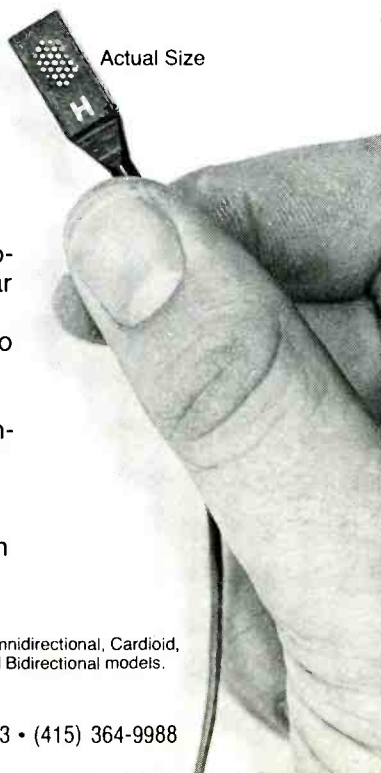
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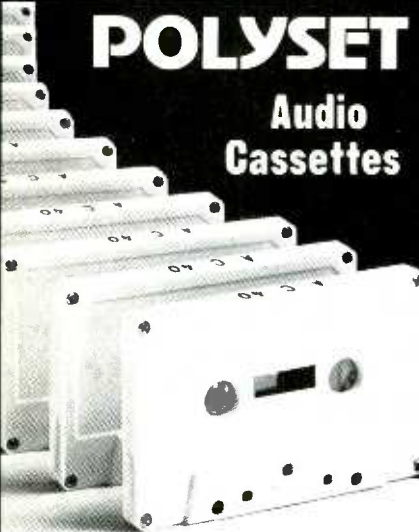


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A little-known fact is that 0 dBm = 0 VU. A level of 0 VU is not the same as a meter reading of 0 VU. When the meter reads 0 VU, the actual level being produced at the output of balanced recording equipment is +4 dBm or +4 VU. Confused? Don't worry about it.

A 0 VU recording level (0 on the record level meter) is the normal operating level of a recorder that produces the desired recorded flux on tape. A "0 VU recording level" does not mean a "0 VU signal level."

With a VU meter, 0 VU corresponds to the recording level that produces about 1 percent distortion on tape, at a frequency from 333 to 1000 Hz. Distortion may be slightly above or below 1 percent, depending on the tape used.

There's another kind of recording-level meter used mostly in Europe: the peak program meter (PPM). It responds very rapidly to peak program levels, making it a more-accurate indicator of true recording levels. The PPM is calibrated in dB, rather than VU. Unlike the VU-meter reading, the PPM reading does not correlate with perceived volume.

A VU meter responds too slowly to track rapid transients accurately, so it usually reads lower than the actual peak level. For example, if you're recording drums at 0 VU on the meter, the actual peak level may be 8 to 14 dB higher. So, whenever you record instruments having a high peak-to-average ratio, such as drums, piano, percussion, or horns, record at -8 to -14 VU to avoid saturating the tape. Some mixers and recorders include an LED that flashes on peak over-

loads, which helps you set recording levels more effectively.

Balanced vs. Unbalanced Equipment Levels

Generally, audio equipment with balanced (3-pin) connectors works at a higher nominal line level than equipment with unbalanced (phono) connectors. There's nothing inherent in balanced or unbalanced connections that makes them operate at different levels; they're just standardized at different levels.

Shown below are the nominal (normal) input and output levels for the two types of equipment:

Balanced: +4 dBm (1.23 volts or +4 dBu)

Unbalanced: -10 dBV (.316 volt)

When a balanced-output recorder reads 0 VU on its meter with a steady tone, it is producing 1.23 volts at its output connector. This voltage is called +4 dBu when referenced to .775 volt, or +4 dBu when referenced to 1 milliwatt. When an unbalanced-output recorder reads 0 VU on its meter with a steady tone, it is producing .316 volt at its output connector. This voltage is called -10 dBV when referenced to 1 volt.

Interfacing Balanced and Unbalanced Equipment

There's an 11.8 dB difference between +4 dBm and -10 dBV. How did we get that? By referencing both voltages to 1 volt:

$$+4 \text{ dBm} = 20 \log 1.23/1 = +1.8 \text{ dBV.}$$

$$-10 \text{ dBV} = 20 \log .316/1 = -10 \text{ dBV.}$$

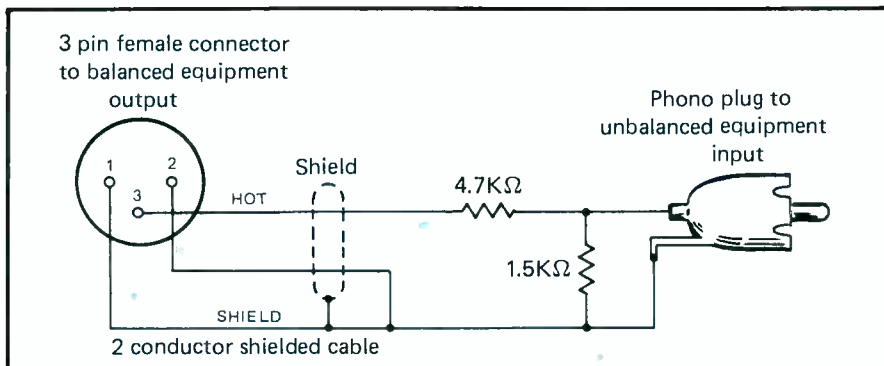


Figure 3. 12 dB pad, which matches output level of balanced equipment to required input level of unbalanced equipment.

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So, +4 dBm is 11.8 dB higher in voltage than -10 dBV.

Connecting a +4 dBm output to a -10 dBV input will most probably cause distortion, because the signal peaks of the +4 equipment may exceed the headroom of the -10 equipment. To attenuate the level 12 dB when connecting the two types of audio gear, you can use a pad as shown in *Figure 3*. It converts from balanced to unbalanced and reduces the level 12 dB. (You may have to substitute a stereo phone plug for the 3-pin connector.)

However, you don't always need that pad. Many pieces of equipment have a "+4/-10" level switch. You just set the switch to the nominal level of the connected equipment.

Microphone Sensitivity

Here's another confusing area concerning decibels: microphone sensitivity. A microphone-sensitivity spec tells how much output (in volts) a microphone produces for a certain input (in SPL). A high-sensitivity microphone puts out a stronger signal (higher voltage) than a low-sensitivity microphone, when both are exposed to the same sound pressure level.

Microphone sensitivity is especially confusing because it is specified in many ways:

1. dBV per pascal
2. dBV per 10 dynes/cm²
3. dBV per microbar
4. dBV per dyne/cm²
5. dBm per 10 microbars
6. dBm per 10 dynes/cm²
7. dBm, EIA

We'll explain each of these. First note that:

$$\begin{aligned} 10 \text{ dynes/cm}^2 &= 10 \text{ microbars} = \\ &1 \text{ pascal} = 94 \text{ dB SPL} \\ 1 \text{ dyne/cm}^2 &= 1 \text{ microbar} = \\ &74 \text{ dB SPL} \end{aligned}$$

A typical microphone sensitivity specification might be: Open circuit voltage: -75 dB re 1 volt per microbar. That means, the mic produces -75 dBV, unloaded, when exposed to a sound pressure level of 1 microbar (74 dB SPL). You put 74 dB SPL in; you get -75 dBV out.

Another way to express the same sensitivity is: Open-circuit voltage: -55 dBV/pascal. That is, the mic produces -55 dBV, unloaded, when exposed to a sound pressure level of 1 pascal (94 dB SPL). You put 94 dB SPL in; you get -55 dBV out.

Here's still another way to specify the same sensitivity: Power sensitiv-

ity: -55 dBm per 10 microbars. In other words, the mic produces -55 dBm into a matched load, with an SPL of 10 microbars (94 dB-SPL). "Matched load" means that the load impedance equals the microphone impedance. If the mic impedance is 250 ohms, the load impedance of the mic preamp input is also 250 ohms. This is unlikely to occur in practice; usually the load impedance is at least 7 to 10 times the mic impedance.

"EIA Sensitivity" is expressed in G_M . It's seldom seen, but is useful for calculating the mic's output in dBm for a given input in SPL.

$$\text{SPL} + G_M = \text{dBm output into a matched load.}$$

Here are some typical microphone sensitivities:

Condenser mic: -65 dBV/microbar
Dynamic mic: -75 dBV/microbar

Expressed another way:

Condenser mic: -65 dBV per dyne/cm²
Dynamic mic: -75 dBV per dyne/cm²

Expressed another way:

Condenser mic: -45 dBV/pascal
Dynamic mic: -55 dBV/pascal

Expressed another way:

Condenser mic: -45 dBm/10 microbar
Dynamic mic: -55 dBm/10 microbar

You can't directly compare the sensitivities of two microphones specified in different ways. You have to convert them to the same reference, using these simple conversion formulas:

$$\text{dBV/pascal} = \text{dBV}/10 \text{ microbars} = \text{dBV}/\text{microbar} + 20 \text{ dB.}$$

$$\text{dBm}/10 \text{ microbar} = \text{dBm}/10 \text{ dynes/cm}^2 = \text{dBV}/\text{microbar} + 20 \text{ dB (if mic impedance} = 250 \text{ ohms).}$$

$$\text{dBm}/10 \text{ microbar} = \text{dBm}/10 \text{ dynes/cm}^2 = \text{dBV}/\text{microbar} + 22.2 \text{ dB (if mic impedance} = 150 \text{ ohms).}$$

$$G_M \text{ (EIA) in dBm} = \text{dBV}/\text{microbar} - 71.76 \text{ dB (assuming the mic's rated impedance is 75 to 300 ohms).}$$

Let's use the formulas above to compare the sensitivities of two mics rated in different ways.

Mic #1: -70 dBV per microbar (impedance = 250 ohms).

Mic #2: -55 dBm per 10 microbars.

What is the actual sensitivity difference between these two mics? Before you say, "Who cares?" remember all you have to do is add 20 dB to the

Mic #1 spec, if the Mic #1 impedance is 250 ohms:

$$\text{dBm}/10 \text{ microbar} = \text{dBV}/\text{microbar} + 20 \text{ dB} = -70 + 20 = -50 \text{ dBm.}$$

So, Mic #1 has a sensitivity of -50 dBm, and Mic #2 has a sensitivity of -55 dBm. Microphone #1 has 5 dB more sensitivity than Microphone #2.

Whenever you compare microphone sensitivity specs, note carefully which reference SPLs are used, and convert them all to the same reference.

If you put a microphone in a 20 dB louder sound field, it produces 20 dB more signal voltage. For example, if 74 dB SPL in gives you -75 dBV out, then 94 dB SPL in gives you -55 dBV out. 150 dB SPL in gives you +1 dBV out, which is approximately line level! That's why you need so much input padding when you record a kick drum or other loud sources.

Summary

dB SPL = decibels of sound pressure level above 0 dB SPL.

dBV = dB ref. to 1 volt.

dBm = dB ref. to 1 milliwatt.

dBv or dBu = dB ref. to .775 volt.

dB in general = 10 log P1/P2 (power) or 20 log V1/V2 (voltage).

Balanced equipment, nominal line level at input or output = +4 dBm = 1.23 volts.

Unbalanced equipment, nominal line level at input or output = -10 dBV = .316 volt.

Difference in voltage level between +4 dBm and -10 dBV = 11.8 dB.

0 VU signal level = 0 dBm.

0 VU also means a zero reading on the VU meter.

0 VU on the meter corresponds to +8 dBm, +4 dBm, or -10 dBV level at the equipment output (for a steady tone).

0 VU record level = record level produced at "0 VU" meter reading.

1 pascal = 10 microbars = 10 dynes/cm = 94 dB SPL.

1 microbar = 1 dyne/cm = 74 dB SPL.

Microphone open-circuit sensitivity measured in dBV/pascal, dBV/microbar, or dBV/dyne/cm.

Microphone power level is measured in dBm/10 microbar, or dBm/10 dynes/cm, or dBm/pascal.

db = a magazine worth looking into if you're serious about audio.

For more detail on the decibel, I suggest the book *Sound System Engineering* by Don and Carolyn Davis, Howard W. Sams & Co., Inc., 4300 W. 62nd St., Indianapolis, Indiana 46268.

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Sound Advice

A Little Q and A

This month we'd like to address several questions that were sent in by James R. H. Massiah of Montreal, Quebec.

Q. *What are the advantages and disadvantages of using electronic crossovers in place of passive crossovers?*

A. Crossovers, as you know, split the frequency spectrum of audio waves into divisions that are amplified independently through speakers that are designed to optimally reproduce each range. We think that electronic crossovers have three distinct advantages over passive ones: higher efficiency, greater accuracy, and increased flexibility. Electronic crossovers divide the sound spectrum into highs, mids, and lows *before* the amplifier stage, where the signal is still at a low (line) level, usually between $\frac{1}{2}$ and 2 volts. A passive crossover, on the other hand, divides the sound spectrum *after* the amplifier stage, before the speakers, where there is substantial output power. Working with much higher signal levels, a passive crossover may consume some of the power itself. Though the loss is not substantial, it will not take place at all with the more efficient electronic crossover.

As far as accuracy goes, many electronic crossovers can cross over at a beneficial 18 dB slope, which means that at the point where, for example, the bass meets the midrange, the low end will gradually decrease (roll off) at a rate of 18 decibels-per-octave as the midrange rises at the same rate and crosses it to reach its own set level. This gradual ascent and descent of signal protects your mid- and high-end drivers, and helps keep the distortion down. If distortion does become a problem at the bass end, it will not affect your mids and highs (as it would with a passive crossover system). Also, there will be less phase distortion with most electronic crossovers, so the system will generally sound cleaner.

Finally, most electronic crossovers are flexible to the extent that the crossover points and output levels are adjustable. This allows you to substi-

tute different speaker systems more readily as well as enabling you to use different amplifiers with different amounts of gain (the amount an amplifier boosts the signal).

However, electronic crossovers have their disadvantages. They cost much more than passive crossovers, for instance, and they constitute another separate unit to be transported. You also need more amp channels to use them; subsequently your wiring time and the amount of wiring you need to acquire will increase. Generally, we recommend using passive crossovers with most small systems and for the high-end split of larger, four-way systems where electronic crossovers split the low, mid and upper-mid, and the passive crossover splits the high end. However, electronic crossovers are a must for high power situations where efficiency is crucial, or where crossover flexibility is required.

Q. *How much power can I use in a room that holds up to 1500 people?*

A. Since there are so many factors involved, it is difficult to answer your question with specific figures, but we bet that somewhere between 600 and 1200 watts going into a three-way passive or electronically crossed over system will do the job for most rooms and most material. Several variables will determine your exact power needs. How loud do you want the music to get without distortion? How efficient is your speaker system? How much bass frequency must the system reproduce? What kind of room are you dealing with? If this sounds complex, well, it can be, but if you keep the following ideas in mind, we doubt that you will go too far astray with your decisions.

The bass end of the music spectrum typically consumes 70 to 85 percent of your power output, so most of your estimating should concern that area. It is a good idea to set up a test system. If possible, do this in the actual location that you will be working. Play some tapes through it, using material similar to that which the system will be handling. At this point you must estimate the volume level you will need in order to overcome

ambient noise (fan blowers, audience noise, etc.) during the actual performance. If the room is very "live," with lots of hard surfaces and little in the way of upholstery or drapes, you'll need less power than you will for a "dead" room. Ideally, you will have more power available than you actually need, so there will be some reserve gain (headroom) should you discover the audience to be rowdier than you had anticipated. Obviously, you are safer with an amp that is rated with more power than your estimate calls for—especially since an underpowered amp will go into distortion more quickly as you attempt to increase the sound level, and this kind of distortion can burn up your speakers as easily as overpowering them can.

Q. *Please discuss the coupling of speaker boxes with amplifiers.*

A. This is a broad question that could cover a lot of ground. Since we discussed the topic of connectors and wires in our last column (*MR&M*-May '84), we will move on to lightly touch the electronic aspect of coupling. A subject worthy of extensive treatment, we will approach it here very basically.

It is necessary to match the impedance of each speaker load as closely as possible to the output impedance of the amplifier. Most professional PA amps work best with about a 4-ohm load on each channel. Since most complete cabinets (3-way, 2-way, etc.) are 8-ohm, two cabinets-per-channel is the usual hookup. You could use one cabinet-per-channel (a higher impedance load), but you wouldn't be getting the full power from the amp. It is risky to go the other way and hook up more cabinets (a lower impedance load) to the amp, as this can cause it to distort or fail totally. Some amplifiers can be loaded down to 2 ohms, as with four 8-ohm cabinets, without any trouble. Always check your amp's manual and, if still unclear, consult a knowledgeable technician or dealer.

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SEND 2 1 2 3 4 5 6 7 8 9 10

MON. 1 2 3 4 5 6 7 8 9 10

EFFECTS 1

CLIP 4 5 6 7 8

OUT 2 1 0 10

PATCH

CLIP 4 5 6 7 8

RTN. 2 1 0 10

EQ

HI 0 6 15

LO 0 6 15

SEND 1 2 3 4 5 6 7 8 9 10

EFFECTS 2

CLIP 4 5 6 7 8

OUT 2 1 0 10

PATCH

CLIP 4 5 6 7 8

RTN. 2 1 0 10

EQ

HI 0 6 15

LO 0 6 15

SEND 1 2 3 4 5 6 7 8 9 10

MONITOR 1

CLIP 4 5 6 7 8

BUSS LEVEL 3 2 1 10

EQ

HI 0 6 15

HI MID 0 6 15

LO MID 0 6 15

TUNE 500 1.5 3.0

Hz KHz

LO 0 6 15

MONITOR 2

CLIP 4 5 6 7 8

BUSS LEVEL 3 2 1 10

EQ

HI 0 6 15

HI MID 0 6 15

LO MID 0 6 15

TUNE 500 1.5 3.0

Hz KHz

LO 0 6 15

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ANTHONY DAVIS

ACOUSTIC EXCELLENCE

gene kalbacher

When the acoustic pianist-composer Anthony Davis plays Carnegie Recital Hall, his ensemble doesn't include a drummer who drops bombs on the bass drum. Of course not. The drum would drown out the ensemble interplay and disrupt the acoustical balance of the hall.

When Davis performs in a nightclub, he doesn't devote an entire set to one 40-minute piece with five movements that was written with a dance troupe in mind. Of course not. The attention span of the audience, not to mention the coming and going of patrons, would shatter the mood of the piece.

Davis, a 31-year-old New Yorker and one of the most venturesome composers of new music on the scene today, strives to perform his music in the most acoustically

compatible environment. In the manner of his idol, Duke Ellington, Davis uses his ensemble, in aggregate, as a musical instrument. Davis's ensemble is Episteme, a "pool" of musicians whose number varies according to the needs of his particular works. Yet in addition to this collective musical instrument, Davis believes that the space in which the music is played—be it a concert hall or a recording studio—is also an instrument. In short, Davis adapts his group to his music and his music to the space.

Why, then, would a formalist composer—a serious composer whose admiration for Ellington and Cecil Taylor doesn't preclude his interest in Stravinsky and Balinese gamelan music—choose to conduct a serious, technical interview in a coffee shop? Actually, coffee shop is too genteel a term for the bustling downtown luncheonette to which the composer directed this interviewer. Sipping a soft drink at a table no larger than the rim of a garbage can, Davis spoke excitedly about his music—about "choirs" of instruments and slow "canons"—seeming, at first, blissfully oblivious to the discomfort of his guest.

On the table with the napkin dispenser, salt and pepper shakers, ketchup and the two drinks, there was scarcely room for the interviewer's tape recorder. With a big smile on his face, utterly devoid of pretension and still unaware of the clamor, Davis rearranged the condiments to demonstrate the positioning of various choirs featuring flute/contrabass clarinet, trumpet/trombone, and cello/violin.

When the composer ran out of table objects to complete his choir pattern, the guest's cigarette pack and lighter were pressed into service. The composer's demonstration, nimbly executed, reduced the high-art subject matter to a level even the waitress would understand (if she hadn't been too busy stacking plates).

Meeting the gaze of his guest, and perhaps feeling a trifle self-conscious after his table orchestrations, Davis nodded in assent to the suggestion that the duo repair to the offices of Gramavision Records to complete the interview.

There, in the resounding stillness of the label's in-house mixing studio, the composer discussed his piano studies (beginning at age six and continuing at Penn State and Yale), his structuralist inclinations as a

To me it's very important that you have a rapport with the engineer. If you don't have a rapport with the engineer, you'll never get the music the way you want it.

composer, his recordings (several as a leader for Gramavision and various as a sidemen for friends) and his upcoming projects (a solo-piano LP and an opera based on the life of Malcolm X).

Davis, slender and boyish-looking with a bushy head of hair, laughs easily and abruptly, a laugh so sudden and forceful that his entire upper body seems to whiplash when he lets go. The composer, who resides in New York with his wife, author Deborah Atherton, and young son, is so jovial, so candid, that a stranger, meeting him for the first time, is at first hard-pressed to equate this bubbly musician with the majestic music that has earned him international acclaim.

The interview begins with Davis's assertion that a performance venue, interviews notwithstanding, must serve the best interests of the music at hand. In the interest of readability, the sounds of clanking cutlery have been excised from the transcript.

Anthony Davis: I've been in situations where I've heard music that was totally inappropriate for the space. A classic example is someone playing very crowded, busy music in St. John the Divine [in Manhattan], which is a very booming place because it has very high ceilings and a long echo delay. It doesn't work. It would never work. The whole idea of amplifying in a space like that is ridiculous. So what really works in a space like that would be slower-developing [music]. The space you play in is a musical instrument, too. You have to think about how the music will be best served....

For example, I want to do a duet piano performance with Ursula Oppens, in which we have two pianos, and Earl Howard's going to create a quadrophonic tape so we can set the pianos out on different sides of the room, have the audience in the middle of the room, and the speakers projecting the music into the audience. So you get the pianos criss-crossing

back and forth within a space, and the audience in the middle. But you can't do that in a proscenium stage, in a regular concert hall.

Those are the kinds of things you have to think about: Where are the best places to present your musical ideas? I've learned the hard way, because I've tried to *force*...to make my music fit into a particular situation. For example, playing in a club is very difficult for me and especially for [the group] Episteme. To me, it's not the appropriate place for the music, for several reasons: the crowded nature of the stage, the way the sound is amplified, and also the length and duration of my pieces. It requires a different kind of concentration to listen to seven- or eight-minute pieces. Other than just the philosophical idea that you think the music doesn't belong in a club, for example, there are a number of esthetic reasons why you play in one place or another.

MR&M: This proxemic sense of tailoring the music to the space is something you've developed over the years?

AD: Oh, yeah. First of all [early in my career], I wasn't in the position to pick and choose. I was in the position where I said, "Well, they offered me a job, I have to do the job [laughs]."

Now I think that Episteme gives me the chance to have a flexible group, which I really enjoy. And it's really necessary because some of the people have their own projects. In a sense, the solution for me is to have a pool of musicians, of friends of mine, who know my music, who are empathetic to what I'm doing, and I draw from that.

MR&M: Here's a chicken-or-the-egg question. Which came first, the group Episteme or the piece "Episteme"?

AD: "Episteme" was originally a composition for three pianos. Basically, I was interested in writing interactive music—systems of music where the three improvisors had to

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socially interact. I did it in Woodstock [N.Y.], and it was the first time I used that title. Then I did a quartet with trombone, clarinet, guitar and piano; that was my first Episteme concert. Then I got involved with a sextet: trombone, clarinet, cello, piano, bass and drums.

MR&M: But did any of these ensembles perform the work “Episteme”?

AD: No. I never did “Episteme” with a group.

MR&M: What does “Episteme” mean?

AD: It means “knowledge” in Greek. In Plato’s *Republic* there are levels of cognition. I think the highest level is called *noesis*, which is knowledge of the forms, which I don’t have. I wouldn’t have the audacity to say I know anything about that. “Episteme” isn’t the highest form of logic, but it’s the logic that humans are capable of. But it’s not divinely gifted.

MR&M: How does this abstract concept of “Episteme” relate to your philosophy about music?

AD: To me, “Episteme” is always about an exploration of form, musical form.

MR&M: According to your design, Anthony, must any aggregation you call Episteme—be it quartet, sextet or whatever—have that “socially interactive” element that underlined the composition called “Episteme”?

AD: I think they do. That’s at the core of my music. Episteme [the group] is now branching out to do works by other composers. Earl Howard’s going to create a piece for tape and sextet. Alvin Singleton, a composer who lives in Austria, who I think is an incredible composer, is doing a piece for Episteme, too. But both of these composers share with me an interest in exploring areas that incorporate improvisation into well-defined compositional form.

MR&M: So your repertoire varies to suit the capabilities of the space to which it will be played. Do you personally scout the rooms before playing, or even accepting, the gigs?

AD: I know a lot of the spaces. I have a feeling for what music will work. For example, I had a real feeling about what music would work in Carnegie [Recital] Hall. To me, it would be ridiculous to play with drums in there because you couldn’t find an acoustical balance; the drums would overwhelm the ensemble.

MR&M: Living as you do in Manhattan, and performing here

often, you obviously know the acoustics of the local halls. But what about venues in Chicago, let’s say, or San Francisco? What sort of homework do you do for those performances?

AD: Most places I play these days are very good about sending me a diagram of the space—where I want something set up, or where I want the seating to be, if it’s that flexible, or what kind of amplification I require.... I find it an exciting challenge to think about what music really works in what place.

MR&M: I would imagine, Anthony,

silence is beautiful, that space in the music [is very important].

One of the worst situations is when you play on the piano and someone puts a carpet under it. I *hate* that! All the sound is being sucked up in a rug, and it only travels as far as the length of your arm, then it seems to *die*. In that situation, I think, the tendency is to play very busy because you try to overcome the feeling that you’re not really projecting. You have no sense of hearing, you don’t have a three-dimensional reception in your sound; you have no sense of sound as a shape.

There was a time, in the '60s, when the whole idea of recording was to record in this 'dead' room. And then they added the echo and reverb afterward, in the mix. I find that totally opposed to music-making.

that the process is sometimes reversed—you tailor or select the space to suit the music.

AD: Oh, sure. That happens all the time. In Cincinnati, for example, I did a concert in a museum with a sextet. Sometimes it’s very nice to play in galleries; it’s very flexible in terms of where you can put the music. So we put the players more in the middle and had the audience around them [like a semicircle], but still with the idea of the music projecting out. And it was beautiful. I’ve found that in a lot of places across the country—Minneapolis, Cincinnati, Chicago, San Francisco—there are a lot of surprisingly great places to play new music. One of my favorite concerts in the last 10 years was a performance I did in Sante Fe, New Mexico, with a trio with George Lewis and James Newton. It was a 16th-century church with walls that were three or four feet thick. It had wood floors. It was one of the most beautiful acoustic settings I’ve ever played in. The piano was very good and the ceilings were pretty high. When you play in a place like that, you start to be aware that

It’s just a note, and it dies. It has no ring, it has no resonance; you don’t hear the overtones. To me, that’s real important, especially with a pianist, because you’re always playing with the room. And the piano plays really interesting tricks with rooms. I remember I played another concert in New Mexico. They had beautiful rugs. In the ‘60s, musicians always wanted to play with carpets [underneath them]. It was like Indian musicians....

MR&M: ...playing sitars and tabla drums.

AD: (Laughs) Right. They put the piano on top of these beautiful rugs. I played the first half of the concert and said, “Oh, boy! This is terrible! I’m afraid you’re gonna have to move the rug.” I knew they would be really upset, because [the rug] looked nice and the floor underneath was kind of drab. It wasn’t going to work [with the rug]. Every note I play—it’s *gone* the minute I play it. [When they moved the rug] the difference was like night and day.

I find that with recording situations, too. There was a time, in the

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I like to set up what Earl Howard calls "choirs" of instruments. For example, in my 10-piece ensemble I might use a choir of trumpet and trombone. Strings is a choir—violin and cello. Vibraphone and piano is a choir—percussion and keyboard.

'60s, when the whole idea of recording was to record in this dead room. And then they added the echo and reverb afterward, in the mix. I find that totally opposed to music-making. I try to find a room that has some kind of natural sound that works. As a performer, I don't like to play music and listen to it with the quality you hear from headphones. That, to me, is a real distortion.

MR&M: It seems an unnatural function.

AD: Yeah. Also, in terms of orchestration, when I'm orchestrating I really think about how instruments sound in different registers and how they project. And the more you get into orchestration, the more you have to get into acoustics, the more you have to get into how the music sounds in a space. For example, with the sextet I went through a whole thing of how [musicians] *sit*. We have violin, cello, flute, clarinet, bassoon and piano. And I've had different formations. One was putting the piano more in the center. There are things that people don't think of. With a proscenium stage, when you're looking at a group, the piano always has to be on the left. That's basically because of the way the piano projects. The piano always has to be left of center.

MR&M: In other words, the piano has to be stage right.

AD: Yes...[Formation] is something you really have to think about.

MR&M: And that varies from room to room. So would you experiment with formations during the soundcheck before a performance?

AD: Yes. Especially when you're doing instrumentations that are not

traditional, such as flute/clarinet/bassoon/violin/cello/piano. This essentially combines a woodwind quintet and string quartet.

MR&M: How does this apply in a recording situation?

AD: I've been recording in a room, Vanguard Studios, which is a very large room, essentially because it gives me a lot of flexibility about where players can be; they can change [position]. I don't like to have a completely separated sound where you have each instrument really isolated. I like the idea of leakage in the sense that that's what creates an ambience for the whole music, so you hear it as one music. But the idea is to have it both ways: You can possibly manipulate one instrument or another in some way in recording, but situated in such a way to make sense, to create a good blend, a good mix. So when you hear it in the speakers, you know where every instrument is. When you change that [formation] around, it's amazing, you hear the music differently. It's always a dilemma to me...

MR&M: I can see where that could cause a major problem for you. Being a structuralist, a formalist composer, you want to hear the music performed the way you wrote it, notwithstanding the improvised sections, in which you give the players certain latitude. The placement of the musicians in the room, even if they play exactly what you want and when and where you want it, can change the emphasis of the music.

AD: Oh, right. Most definitely. It's something you have to be really sensitive to. If you, for example, have chosen a formation of instruments,

that doesn't work, you know pretty soon because there are things you can't do. Certain balances won't work. Especially in my music.

I like to set up what Earl Howard calls "choirs" of instruments. For example, in my 10-piece ensemble I might use a choir of trumpet and trombone. Strings is a choir—violin and cello. Vibraphone and piano is a choir—percussion and keyboard. Then the woodwinds—it could be flute/clarinet or clarinet/contrabass clarinet. Or it might be more complicated than that. That's already four or five choirs right there. Then there's percussion/bass. In one piece I had a slow canon in which I used the flute/contrabass clarinet, trumpet/trombone and cello/violin. That was essentially the slow canon that was going on. Then I had the piano/vibraphone playing another thing, the bass playing a solo, and the drums keeping time. So, in a sense, you have in the slow canon one choir. Then you have another choir for the vibraphone/piano; then you have another choir for the bass, which is essentially a solo; then you have the drums.

MR&M: The bass and drums are separate choirs?

AD: Yes. You see, I don't use the traditional idea [of the bass/drums in a rhythm section]. What I love about writing for ensembles like Episteme is that instruments can function in a completely different way. In most traditional improvisational music, bass and drums and piano function as a rhythm section. I mean, that's one way, just one way, in which a group can be separated into choirs. For me, sometimes I might use vibraphone/piano as the motor part of the music, and use bass as the melodic instrument, and the chordal idea might come from a combination of the other instruments, like the slow canon idea [enumerated above]. Or, sometimes, I might use the trombone as the rhythmic generator. There are all kinds of ways of doing it. I always visualize it, so I see this here (points above his head) and this over here. It's like sculpture in a sense. You're thinking in terms of revolving structures that utilize constantly shifting instrumentation and orchestration. To me, it's unfortunate that so much improvisational music has been locked into particular patterns that may not be the most interesting.

MR&M: Why do you suppose that is, Anthony? Convenience? Commercial acceptance?

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AD: Well, it *works* (laughs). [In a piano/bass/drums trio] you are, in a sense, ascribing very clearly different registers to different instruments: the piano is in the middle register; the bass is in the lower register. With the drums, you have a cymbal, which in a sense is the upper end; the snare is more the middle register; the bass drum is the low register. If you look at it as an orchestra, you see right away how each thing is functioning. In a piano trio, for example, in a way it's almost like two orchestras: There's the piano/bass and then the drums. The drums do the whole spectrum of sound, from top to bottom. So [the drums] are free to cover all those areas. I find that people are so conditioned to hearing that kind of thing. That's why I've never done a trio piano record, even though it would be a challenge for me to do....

MR&M: Let's return a moment to the recording studio. Besides the spaciousness of Vanguard, what other features of the room do you find conducive to your music?

AD: It's a large room with high ceilings. It's not extremely "live," though it is live to some extent. It's

not "dead," like some other recording studios. It's not like a church, which is too boomy for percussion. When we work with a tape piece, I need to have a studio with a direct line from the tape into the board. And Vanguard is very flexible. I've enjoyed working there, and I've had a pretty good experience there.

I may also look for other situations for recording in the future. Mark Levinson, for example, is a guy I really respect in sound. I've been fortunate to have worked with David Baker, who does my albums and other things for Gramavision. Also, John Kilgore, who did my *Episteme* record. I've had very good experiences with engineers. They're very interested in the music. To me it's very important that you have a rapport with the engineer. If you don't have a rapport with the engineer, you'll never get the music the way you want it.

MR&M: Beyond this rapport you speak of, what other qualities do you require in an engineer?

AD: You have to hear sound somewhat the same way. You don't want [the engineer] looking for something in the music that you don't

want there. Most engineers I've worked with have an interest in what I'm doing, to the point of even studying scores of the music. It's important that they're very serious because an engineer really has a lot of control over how the music will sound.

I've been very fortunate to work with real masters of sound. People like Earl Howard, for example. I call him a "sound consultant." He did the sound for the [*Hemispheres* dance/music] concert at the Brooklyn Academy of Music [last year]. He's also an incredible composer.

MR&M: What, specifically, does his role as "sound consultant" entail?

AD: Essentially, he assisted the band in doing the amplification. He recommended what kind of microphones to get. I was very pleased. That was probably the best the group has ever sounded live.

MR&M: How much amplification does the group require for live performances?

AD: When I use the drums, I have to amplify the other instruments, specifically the strings and woodwinds. Earl creates a good basic balance for the ensemble, which also

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allows the musicians to control the dynamics themselves. You don't want someone at the mixing board controlling dynamics.

I'm recording a piece of Earl's on my next record, a solo piano record. I'm doing a piece for tape and piano called "Particle W," which I'm very excited about. He'll be involved with that a lot because essentially he's created one of the most exquisite electronic music pieces I've ever heard.

MR&M: What will the tape consist of?

AD: He's using a Serge modular synthesizer, basically to create the textures. He's also composed the piano textures, which interact in a real exciting way with the tape. Sometimes the tape foreshadows things I'll be doing on the piano, so there's real interaction there.

I think Earl is making some of the most exciting electronic music I've ever heard. What I find really interesting in his music is that the same esthetic applies to both acoustic instruments and electronics. I find that with many composers, there's no sense of continuity in ideas between the two. With Earl, there is.

Earl's been a tremendous help to me as I've been rethinking a lot of my ideas about sound. I remember when I did my first concerts with Episteme, it was very frustrating for me at times because I used to be able to get what I wanted on a record pretty much, but to create the same effects live was very difficult. Generally, it was the whole problem of amplification. I remember doing concerts in the Public Theatre [in Manhattan] without adequate rehearsal or sound time. "tech time." I think now I'm starting to overcome a lot of those things, so the audience can really hear what I heard when I was writing it (laughs).

MR&M: On *Hemispheres*, your most recent recording, did you do any overdubbing?

AD: There is some overdubbing. Basically, most of the overdubbing was done to reinforce the strings. In "Little Richard's New Wave," there's a section underneath the trombone solo. I added two more violins, just playing the same note. And two more cellos playing the same note. It had more presence, more body to it. It added something with more power to the performance. In an acoustic setting, I find I can do it with

amplification, by amplifying the strings with good microphones, I never use amplifiers when I record, but in live performance I will use the PA, especially to reinforce the strings....

MR&M: How did you mic the instruments for the live performance of *Hemispheres* in Brooklyn?

AD: I had the flute and clarinet [players] located as part of the semicircle [of other musicians]. Then I had the brass instruments [trumpet and trombone] behind them. What was interesting was that we didn't have a microphone for the brass; the brass were picked up by the woodwind mics. We had a microphone for the woodwinds and a microphone for the strings. We had a microphone for the piano and for the vibraphone, but nothing for the drums.

MR&M: In the recording studio, do you mic the piano differently for every project?

AD: It varies. For solo piano music, it's mic'ed quite differently than it is for my ensemble. You need more room for your sound when you're solo; you wouldn't want the mics too close. You want more distance [from the mic] to get the feel of the sound. For an ensemble, you have to create some separation of the sound. You have to baffle the piano so there is less leakage of the other instruments into the piano. I think the thought these days is that leakage isn't such a bad thing.

MR&M: Leakage isn't by nature an odious thing.

AD: No, of course not. It means you play at the same time, you know (laughs). I mean, it's good to know that that actually happens (laughs).

MR&M: When many musicians or groups say they're "going into the recording studio," it doesn't necessarily mean they're going into the studio to record pre-written tunes. They often go in to *compose*.

AD: Not me (laughs). Usually for my records, I have at most three days in the studio. I know so many musicians who spend a month or two months in the studio. For me, I'd rather rehearse it. Then I go into the studio for three days or two days, and you should be able to do it.

MR&M: How often do you rehearse before entering the studio?

AD: I like to rehearse a substantial amount. You always have battles with some musicians about rehearsals. I would ideally like to rehearse for *weeks*. But usually about two weeks of

solid rehearsal, about four to six rehearsals. Or sometimes I get together with people individually. But I work with very good musicians who are very quick and just excellent on a technical level; I couldn't find better musicians than the people I work with. George Lewis, James Newton and J. D. Parran are immaculate as musicians. They can technically play anything I think I can write. It's almost a challenge to me to see if I can come up with something that gives them a little difficulty (laughs).

MR&M: When your musicians assemble in the recording studio to cut the music you've composed at home, either on the piano or on paper, or both, do the players replicate your music exactly the way you heard it when you conceived it?

AD: (Laughs) I'd have to say pretty close to the way I hear it. Sometimes I'll have surprises. Occasionally I'll change things in rehearsal, if I find something that doesn't work or I don't like a particular orchestration. I'm always modifying my music, even after I've recorded it. I think the next time you hear this music [picks up the *Hemispheres* album jacket], it'll be different from the record. You're looking for the ideal thing, you're going for the home run all the time.... But basically, what I compose comes out [in the recording] the way I want.

I love the surprise of creating textures for improvisors. One of the things I really enjoy is hearing a great improvisor—let's say, George Lewis, James Newton or J. D. Parran—react and respond to some of the textures. Their solutions are so vital to how the piece works. George will do something different every time. I think it would be funny for someone to see how much agonizing goes on in the decision process in deciding which takes to use for a particular piece. For "Little Richard's New Wave" I had another version that is very powerful, too. George's improvisations are *fantastic*.

MR&M: How often does it happen, Anthony, that you have a number of different, yet equally satisfactory, takes from which to choose one ultimate version?

AD: All the time. I think that's the saddest part about making a record—trying to decide what goes on and what doesn't. That's the hardest thing for me, to let go of something I really like.

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One night we had to sleep in a hayloft near this club we played in in Germany. We spent our very last guilders on a falafel in Amsterdam at six o'clock in the morning.

produced first release by lead vocalist/guitarist Richard Barone, bassist Rob Norris and drummer Frank Gianinni was hailed as a classic. A clear view of modern pop, its 15 songs demonstrated fresh reactions to traditional themes and sage treatment of new musical territory.

Signing with RCA in 1983, the Bongos added a new member, guitarist James Mastro, and entered the studio with veteran producer Richard Gottehrer. With their latest release, *Numbers With Wings*, the Bongos continue to mine the same pop vein with clear-cut melodies, diversely derived accompaniments and terse, often cryptic lyrics. The five songs on the "mini-LP" are longer, more complex, and reflect a more deliberate, less urgent tone than their previous work.

MR&M cornered the four Bongos in the midst of an American tour where, despite having varying degrees of influenza, the band gave a spirited performance and graciously talked to us in detail about their latest release, their exploits in Europe and synthesized dogs.

Modern Recording & Music: Although melody is in the forefront, rhythm seems to be an exceptionally important element of your music. Do you write the songs around rhythmic ideas, or is percussion the afterthought?

Richard Barone: Nothing is ever an afterthought. Percussion is one of the earliest things we put in. Some-

times we write the words around the percussion.

James Mastro: All the songs are not written in that way, though. There's no format.

RB: Right, the songs are all written differently, but the percussion is always an important part. Percussion can lift a song out of mediocrity. Rock 'n' roll came from percussion, from the sound of African drums, and we keep that in mind when we write a song.

Frank Gianinni: We're glad to see people rediscovering African rhythms.

MR&M: (to the rhythm section, Norris and Gianinni) To what extent do you two work as a team to define the song's rhythmic framework?

Rob Norris: As far as deciding our parts, the songs pretty much spring forth, almost instantaneously.

FG: But we have been paying attention to each other more, especially since we started working on the new record. Since then, we've started doing things like putting more of the bass in my monitor, and having more of the drums in Rob's monitor. For a long time we didn't do that; we didn't really consciously think that I should, say, play the kick drum a certain way with the bass.

MR&M: What influenced you to integrate your parts more?

FG: The whole process of recording. Our producer, Richard Gottehrer, really took Rob and I apart, and I

became very conscious of what the bass was doing. You really have to do that.

RN: We've been playing together for eight years and it's always been very spontaneous. We never really thought about what we did. Gottehrer made us listen to what we were doing, and it was a whole new thing for us.

MR&M: Last year you moved from an independent to a major record label. What differences has this change made for the Bongos?

RB: *Money.* The difference is money. On an independent label, you're on a shoestring budget. When you go on tour you don't usually get the kind of support that is needed to do it properly. Your records aren't in all the stores. If there actually are posters, there are not many. We needed to go to a major label to do what we wanted to do, to record on a larger scale and to tour for a longer time.

FG: We have a much larger budget now for everything we want to do. A larger album budget, a larger video budget. Our records are in most stores now, and posters are up. Print ads appear, which is something that, with an independent label, we had to do ourselves.

RN: I think major labels move a lot slower, though. Everything takes longer. It seems ironic, but independent labels move more quickly. They're more on top of things, more attuned to the street.

FG: The problem with very small labels is that they often worry about going bankrupt, running out of money altogether. The label we started with, Fetish, ultimately did just that. There's always that fear, which just doesn't happen with a major label.

MR&M: What about tour support?

FG: There's a tour bus parked out there.

RN: Last time we toured we were in a little mobile home.

FG: The time before that was in a van. The time before that was in a station wagon.

RN: The time before that was in a '66 Valiant.

MR&M: You toured Europe while still under the auspices of Fetish. What was that like?

RN: It was very much a shoestring operation, but it was fun.

FG: It will probably never happen that way again. We traveled around in VW buses, we slept in people's homes. We met many wonderful

people. It was an experience I'll cherish forever, but I would never want to do it that way again.

MR&M: It took that much out of you?

RN: No, no, it was a lot of fun, but we didn't even know how we were going to get home. One night we had to sleep in a hayloft near this club we played in in Germany. We spent our very last guilders on a falafel in Amsterdam at six o'clock in the morning.

MR&M: I heard that you played some interesting venues.

FG: We played in art galleries, big theaters, little theaters, pubs, all sorts of places.

MR&M: How did the response you received differ in countries where English was not the native language?

FG: Well, in Germany, bands that want to have hit records sing mostly in English. That's not so much the case with the independent European labels, but it is true for the bigger acts.

RN: Language was never a problem. If anything, the reception was superior in Europe to that in England.

MR&M: Because you were an American band?

RN: Yes, in both respects. In England there's a natural bias against American bands, and in Europe there's a natural receptivity.

MR&M: Why do you think there's a bias in England?

RN: We didn't wear costumes or something. We never could figure it out. It's like the British thing here in reverse.

MR&M: Do you think your next assault on England will be more successful?

RN: I think so. We'll have a lot more support, a stronger base.

MR&M: There is a definite difference in tone between *Drums Along The Hudson* and *Numbers With Wings*.

RB: *Drums Along The Hudson* was a really good garage album. Actually, it was recorded in a barn in England. It was self-produced. It was recorded very quickly, on 24 tracks, almost totally live in the studio. We spent one day recording the basic tracks, and two weeks with the overdubs. We were going after a live sound that was enhanced by studio effects. We took a totally different approach with *Numbers With Wings*. We started from scratch making a studio recording, layering everything one track at a time.

JM: We wanted to expand on the

We've been playing together for eight years and it's always been spontaneous. We never really thought about what we did. Gottehrer made us listen to what we were doing, and it was a whole new thing for us.

first record, which was a nuts-and-bolts thing, and create something that was almost larger than life.

FG: We experimented a lot. Gottehrer was open to letting us try a lot of ideas. We went around in full circles at times with song arrangements. We tried anything and everything and still kept within our time schedule.

RB: We don't think the new record is better than *Drums*, it's just so different. We're very happy with it.

JM: Another big difference came from bringing in an outside producer.

RB: We had long meetings with the producer, Richard Gottehrer, and the engineer, John Jansen, and then we just concentrated on the performance. Our idea was just to play and sing without running back and forth to the board to change the EQ'ing. We didn't touch the board this time. We trusted the people who did; they were friends of ours.

RN: It was a luxury to put ourselves in the hands of two people who were capable of getting the sounds we wanted.

MR&M: The vocals on *Numbers With Wings* sound as if they've been treated with some kind of effect that distances them in the mix.

FG: Technically, there's much more reverb on the vocals.

RN: It's a much wetter record, even to the extent that the last two songs are talking about water.

MR&M: Did RCA attempt to influence your overall sound in any way?

RN: Not at all. That makes us very happy. They let us choose the material.

FG: There were no restrictions, no censorship. They gave us our freedom.

JM: They signed us for what we sound like, not for what they wanted to make us sound like. That's one of the reasons we went with RCA, the lack of pressure.

RB: They told us not to change. They said the trends would change in our direction. That was good advice.

MR&M: On the new record, I swear I hear a dog barking on the end of one of the songs.

RN: Congratulations! You're the first person to ask us about that dog. It's Nipper, the RCA dog, expressing his appreciation for us being on the label.

FG: You didn't know he could talk? He's giving his approval.

RB: We were going to have a real dog sing, but actually we used a Fairlight for that.

MR&M: I've got to ask you about New Jersey. There are a lot of jokes about New Jersey, but...

FG: New Jersey's got a bad rap.

RN: See, we do that on purpose. We perpetuate those jokes to keep too many people from coming there.

FG: It's really an oasis.

MR&M: Is Hoboken becoming a refuge from New York City for musicians?

RN: Yes, many bands are moving there because New York is such a closed shop. There's a club in Hoboken called Maxwell's which has had an adventurous booking policy for the last four years. The best bands from anywhere play there. It's by far the best club in New Jersey, and in New York City, for that matter. It's the least pretentious, at least, with a very relaxed atmosphere.

MR&M: It's been said of your lyrics that there is a "refusal to state the obvious." Is this intentional?

RB: (pointing at spilled pool of spilled champagne on the table in front of us) It's like this, it's just the way it comes out...again, there's no formula. I wouldn't want to state anything *too* obvious, because then there's no point in writing songs; I could just talk! I'm writing poetry.

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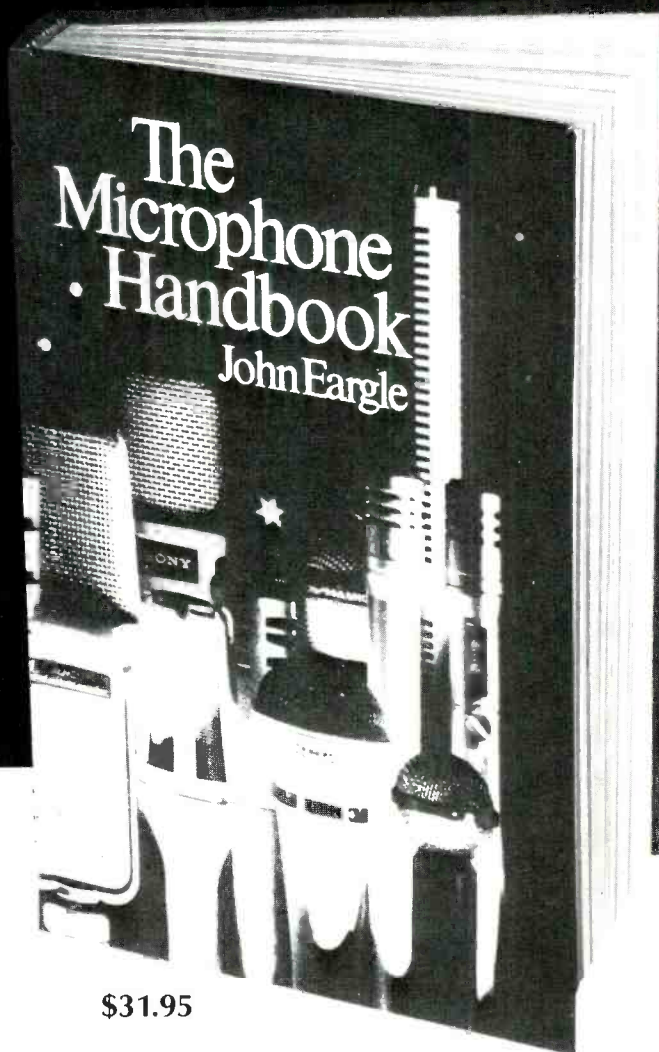
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Musicians Notebook

Peavey Digital Effects Processor



If you still think of funky little guitar amps when you hear the name Peavey, you may be in for a surprise: Over the past decade, Peavey has evolved into a large and well-respected manufacturer of high quality amps, mixers, and guitars. Peavey pioneered the use of sophisticated production techniques that created price breakthroughs in the guitar world; and since Peavey is vertically integrated (i.e., produces many of the components used in their products), they have been able to retain a great degree of autonomy and quality control over their products.

As if manufacturing guitars, mixers, speakers, cabinets, keyboard amps, PA amps, accessories, etc., wasn't enough, Peavey has now entered the signal processing field with their new Digital Effects Processor (DEP). While similar in concept to other delay lines, the DEP includes some fairly unusual operational aspects. At a list price of \$649.50, the DEP is not particularly inexpensive compared to other available delays. Then again, Peavey has always done things just a little differently, and they are clearly trying to compete on a quality, not price, basis. How well do they succeed? Read on....

What is It? The DEP is a bread-and-butter type of digital delay that seems intended primarily for on stage and PA use, and secondarily for the studio. It performs all the standard flanging, chorusing, doubling, short echo, and long echo functions. Packaged in a 3½-inch high rack-mount enclosure, the DEP occupies two rack spaces and is finished in I'm-no-prima-donna basic black, accented with color on the switches, knobs, and LEDs. It plugs into AC power via a three-conductor cord (note, however, that there is no externally accessible fuse post), and generally seems very sturdy. There are three main stages to the DEP, as indicated on the front panel graphics: the Delay stage, Regeneration stage, and Output stage.

Delay Stage. The Delay stage includes a front panel low level input jack; a companion input jack on the rear panel accepts higher level signals. With a plug inserted into the rear panel jack, the low level input jack becomes inactive. A Level control matches the

instrument output to the delay input, while two LEDs (active and overload) aid in level-setting. In theory, ACTIVE lights when your signal level is sufficiently strong to give a favorable signal-to-noise ratio, and OVERLOAD indicates when there is only 3 dB of headroom left. However, there doesn't seem to be all that much difference between the two LEDs; the sound was fairly good even without triggering the ACTIVE light, and it seemed that ACTIVE lit up only slightly before overload kicked in. Still, I shouldn't complain—two LEDs are definitely better than one.

The Delay stage also includes two delay-range-set pushbutton switches (up and down), along with a delay Adjust control. There are nine delay ranges (5, 10, 20, 41, 82, 164, 328, 655, and 1310 ms, each indicated with an LED); pushing one switch increments to the next higher delay range, while pushing the other switch decrements to the next lowest delay range. (The range actually changes when you *release* the switch.) One considerate touch, which hints at Peavey's orientation towards onstage use, is that the flange range LEDs are green, the double range LEDs yellow, and the echo range LEDs red. Thus, it's easy to see at a glance whether you're in the right delay "ballpark."

The Adjust control varies the delay from the delay range value to 1/10 of the range value (for example, from 1310 ms to 131.0 ms). Since this control provides a 10:1 sweep—yet the delay ranges are spaced at one octave (2:1) intervals—there is a considerable amount of overlap between ranges. This comes in very handy when you start working your way around the modulation options—as we'll find out later.

Regeneration Stage. The Regeneration section includes a Feedback Level control and three associated feedback switches, (PHASE, ENABLE, and FILTER). PHASE switches the feedback phase between positive and negative. ENABLE turns the feedback signal on (another useful touch, since you can preset a particular amount of feedback and punch it in when desired). The FILTER switch, when out, inserts a 5 kHz low pass filter in the feedback path to prevent hiss build-up with heavy regeneration; pushing the

FILTER switch in removes the filter for full bandwidth operation. Actually, I would have preferred it if pushing the FILTER switch in restricted the bandwidth to 12 to 15 kHz or so; the full bandwidth feedback position can be too bright sometimes, and I tend not to use this position too much. Restricting the bandwidth to around 15 kHz would still give essentially full bandwidth operation, but might seem a little tamer than the existing full bandwidth setting.

The modulation (VCO) section also resides in the Regeneration section. A modulation ENABLE switch allows you to preset a particular modulation setting and bring it in and out as desired. It would be great if this could be footswitched (*a la* the Ibanez DM2000), but certainly having an ENABLE switch on the front panel is better than having no switch at all. There are three VCO controls: DEPTH (which varies the intensity of the modulation), SPEED (which varies the modulation from 0.1 Hz to 10 Hz), and WAVESHAPE. The latter is the most interesting of the three controls, as it pans continuously between a triangle wave (at the counterclockwise extreme of the control's travel) and a sine wave (at the clockwise extreme). Since these two waveforms are out-of-phase with respect to each other, at the WAVESHAPE control's mid-settings you can achieve some interesting modulation effects. Some of these are more "randomized" than traditional modulation waveforms, and are well suited for chorusing (where a periodic waveform may not be all that desirable in achieving the desired sound).

The most unusual aspect of the modulation section is that it uses what Peavey calls a "Relative Time Monitor" (RTM) system to create musically-useful effects at any delay setting. With most delays, as you increase LFO depth, the effects are not uniform throughout the delay ranges. So, what might be a pleasant warble at a short delay range could be a grotesque pitch bend at longer delay settings. The RTM circuit compensates for these differences in a relatively efficient manner; for example, at the high end of the flanging range (as set by the ADJUST control), you can obtain up to a 20:1 delay sweep for dramatic flanging effects. At the lower end of the range, the sweep automatically becomes narrower. Within a given range, the sweep generally broadens at shorter delay settings and widens at longer delay settings, although this effect becomes less pronounced at longer delay ranges.

Getting used to the RTM takes a bit of practice, since trying to anticipate how it will act (by referring to experience gained with other delay units) is of little use. You're much better off just plunging in and twisting the dials, as long as you remember that the degree of modulation depends on the setting of the ADJUST control. Generally, if you're not getting enough modulation, set ADJUST for a shorter delay. And don't forget that since the delay setting covers a 2:1 range, and the ADJUST control covers a 10:1 range, you can find the same delay setting on more than one range. Therefore, since the ADJUST control setting greatly influences the modulation characteristics, sometimes the delay range you choose will depend on what setting of the ADJUST control gives the optimum modulation effect.

Output section. The DEP output section is pretty simple—bypass switch, synthesized stereo outputs, infinite hold switch, and a Dry/Delay balance control.

The latter exhibits a level drop in the equal mix position (compared to the bypassed level), but otherwise acts normally. The hold and bypass functions may be footswitched from two rear panel jacks, and the output jacks are paralleled on the rear panel for patching convenience. There is also a front panel POWER switch and power indicator LED.

Of the two outputs, I found that Output A was the preferred output for positive flanging, and Output B the preferred output for negative flanging. I generally set up the DEP for mono operation, since (as previously discussed in several *Musician's Notebook* reviews) I've never really been a big fan of synthesized stereo outputs.

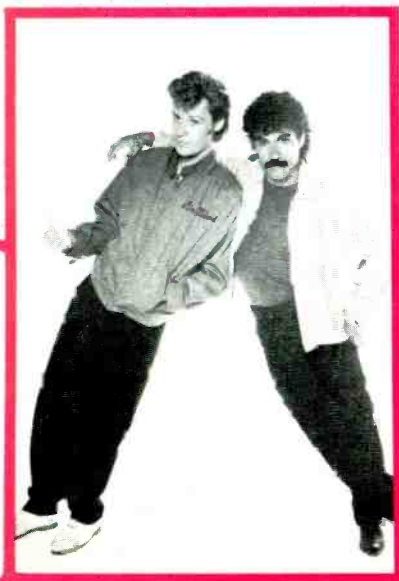
The DEP INFINITE HOLD function is somewhat strange. If you're anywhere in the 82 to 1310 ms range, pushing HOLD stores the last 1310 ms of sound held in the DEP's memory. In the 5 to 41 ms range, pressing HOLD gives you a glitchy sustained note. Unlike most delays, varying the delay time does not transpose the stored sound. Generally, I consider the INFINITE HOLD feature somewhat limited; however, with practice it can be musically useful.

Overall evaluation. We have covered a lot of delays in this column, but the DEP—like the previous subjects of these reviews—is unique and has its own personality. Probably the DEP's strongest point is sound quality. Echoes are crisp and full bandwidth; with properly set levels, the overall noise is very low. Even with hard-to-handle signals, such as a synthesizer playing in its highest ranges, the DEP is astonishingly free of aliasing and coloration. While I've often commented on the various "sound signatures" of different delays, the sound signature of the DEP seems almost totally neutral—sort of like painting a room white.

The RTM feature is also handy, especially for those who play "live" or have to make a lot of on-the-fly adjustments during PA work. While the RTM system can be confusing initially, once you get used to it you will probably find yourself not having to do as much tweaking to obtain the kind of sounds you want, even at long delays.

I do have some complaints about the DEP. Considering the price, it would have been thoughtful to include loop jacks in the regeneration path. While not everyone takes advantage of loop jacks, for those who know what they're doing, these jacks can be indispensable. I also would have liked to see some kind of delay time control voltage input jack, and while I'm putting together a wish list, I certainly wish more manufacturers would put in break jacks between the LFO and master clock (this allows for such effects as footpedal-controlled vibrato depth). If the DEP included some of these extras, I think it would be more suitable for studio applications, since recording engineers and producers tend to be interested in experimentation.

Overall, I feel the DEP delivers solid, professional quality at a reasonable price. It's not a spectacularly innovative or cost-effective delay, but I don't think those were the goals; it appears to me that Peavey wanted to put out something well-built, reliable, fairly priced, easy to set up and use, and designed for extensive road work. If that was indeed their goal, I think they've succeeded quite well.





So We Wanna Be Rock'n'Roll Stars!!

Since November '83, *Modern Recording & Music* has been running a series of articles, "So You Wanna Be A Rock'n'Roll Star," by Denny Andersen. Denny explained, step by step, how a band should prepare, record, and market a demo. During the period the article ran, our band, The Band Next Door, decided to make a demo. This article will explain how we prepared and recorded our demo. Denny's article helped us throughout the whole process: those familiar with the article will notice some of the ideas that transcended. Now (drum roll, please!!), a bit about our band.

The Band Next Door is a four-piece original rock band, based in New York City. The band consists of Michael Baione on drums, Todd Gross on bass and vocals, Aaron Newman on lead guitar and vocals, and myself on rhythm guitar and vocals. We are managed and advised by Gail Schwedock. The band has been together for a year, and has been playing club dates in and around New York for the past six months. We have been in the studio before, but each time were dissatisfied with the results.



Control room at Inner Ear Recording featuring a Tangent Series Four console, and Otari, Tascam and Sony tape recorders.

Our first demo was a “live” recording made on a stereo two-track reel-to-reel. The tape was musically inspired but technically awful. Our next demo was recorded in an 8-track studio where Gail and I had bartered 45 hours of secretarial work in exchange for 11 hours of studio time. The 11 hours took over four months to complete! (The studio moved locations while we were only half done.) By the time we finished the tape four months later, the music seemed stale and dated. In addition, the engineer had very different musical ideas that frequently interfered and slowed our progress throughout the already drawn-out recording. Our third and most recent demo was a raw recording made on a Tascam Portastudio.

This past December we decided to give an all-out effort to make a quality, professional demo. We didn’t want to do anything hasty, nor did we want to drag out the process. We wanted to record a good representation of our music that we could play for record companies and clubs, in order to drum up some further interest in the band. We wanted a demo that we would truly like, and not have to make excuses for. With this in mind, we started to invest our time in finding the right studio.

We originally hoped to spend 20 hours recording a two-song demo. We wanted to record the songs straight, adding no instrumentation other than what the band offered live. We decided to concentrate on 8-track studios, because we thought we could cleanly record on all 8 tracks without bouncing. We hoped to begin recording in the middle of January and finish it a few weeks later, thereby capturing a fresh energy.

Our initial step was to find the studio and engineer that best fits our needs. Some studios were recommended to us, others we discovered through advertisements in various local papers, while still others we found in the Yellow Pages. The price range was from a low of \$15.00 an hour to a high of \$40.00 an hour. We talked to the studios on the phone, finding out if they

could record an entire band live (some studios are not equipped as such), and what specific recording facilities they featured. If the studio seemed interesting, and the representative helpful and friendly, we checked it out.

We finally agreed on Inner Ear Recording, a spacious, professional recording studio located in Queens. We were impressed that Steve Vavagiakis, the owner and engineer, had built the entire studio himself, figuring he would be extremely knowledgeable about every aspect of the facilities. Steve was very friendly and cooperative, offering to listen to our previous demos (we didn’t want to make the same mistakes twice). We agreed on a price, set up dates, left our deposit, and began our musical legwork.

As mentioned earlier, we wanted to start recording in mid January. However, we felt it would be best if we pushed it ahead a month, since the studio selection took us until after the new year, and we were playing clubs a bit. We wanted to spend two weeks rehearsing the material as well, so we pushed the date to February 12. We also decided to expand the two songs into three, and book 24 hours of studio time. We felt two songs were not enough for people to get a musical idea of the band.

It was a difficult process choosing the songs for the demo. We decided to use two of our most commercial efforts along with a more adventurous song to show a different side of the band. It took about two weeks to decide on the songs, as all of us had different ideas. We finally agreed on “(Don’t Leave Me) Brokenhearted” and “One Small Chance” for our more commercial tunes, and “Run Away,” a song we had just started to perform, as the more adventurous.

All the songs needed to be edited for the tape. As Denny explains in his article, “You want everything condensed down to its hottest essence” (*MR&M*, Dec. ’83, p. 39). In “Brokenhearted,” we turned a 16-bar solo into a two-bar interlude and dropped a chorus so the song would clock about 3½ minutes. “One Small Chance” was changed in a similar manner; we condensed the repetitiveness and avoided the long solo. We kept “Run Away” basically the same as it was originally. We figured if anyone was interested enough to play the tape through to the third song, perhaps they would like to hear our more expressive side.

Rehearsing the material before actually going into the studio is *extremely* important. You’re devoting a lot of time, money, and hope into the demo, so you want it to be your best shot. Besides, as the old saying goes, you don’t get a second chance to make a first impression. We spent the two weeks prior to recording breaking down the songs, then building them back up. Even though we had been playing the songs for a while, there was still much room for improvements in the arrangements. We put new strings on all guitars, checked the equipment, bought extra cables, batteries, and strings. Finally, we felt ready.

Steve had begun building Inner Ear about three years ago. It took him over a year to build, doing the construction work himself. Steve had received a B.S. in Music at the City University of New York at Brooklyn College, studying music, physics, and acoustics. He had recorded a lot of physical acts throughout school. He bought a TEAC 3340 4-track recorder when he was 18, which sparked his interest in

recording. Steve has a strong musical background; he has been playing drums and percussion for over 15 years.

Inner Ear is set up with a Tangent Series 4 16-input console and an Otari MX5050-8SHD multitrack recorder. There are four separate isolation rooms, so there is plenty of room to spread out. The amount of quality equipment available in the studio really impressed us.

We arrived early for our first session so we'd have time to set up. The most time-consuming aspect of the setup was the mic'ing of the drums. Michael had brought along his complete kit, in case he felt uncomfortable using any of the equipment there. He ended up using almost all of Inner Ear's 6-piece Sonar kit, exchanging only the high hat cymbals. Since Steve is a drummer, he knew exactly how to tune the kit, as well as how to get the best drum kit. Steve used an AKG-D12E on the bass drum fed into a parametric EQ (10 kHz & 5 kHz), to get a rich "slap" sound. He used a Sennheiser 421 on each of the three toms, a Shure SM57 on the snare, and two AKG-451s as overhead mics. The drums were in their own sound-proof room, with a plexiglass window so all band members could have eye contact.

The three guitars were set up in the main room. Steve placed Aaron's amplifier in an alcove, mic'ing it with a Neumann Km 56 tube mic, set on a cardioid pattern picking up only the source from the front of the mic, rejecting the signal emanating from my amp). He then put a baffle wall in front of the amp, further separating it from my amp. Steve mic'ed my amplifier with a Sennheiser 421, placed about 30 degrees off-axis and within a foot of the amp (to prevent harshness). Todd's bass went into a Jensen transformer direct box, then through a UREI LA-4 compressor set at an 8:1 compression ratio, with -3 dB compression. Bass parts are rarely even; putting the bass through the compressor decreased the dynamic range, making the sound more controllable. Since Todd had put on fresh strings, the bass lost none of its punch. An Electro-Voice RE 20 was set up for my reference vocals (just through the headphone mix—we didn't print them).

After about two hours of setting up, we all gathered in the control room to discuss the assignments of tracks. We assigned three tracks for the drums. Two of those tracks Steve split up, panning the two overhead mics right/left, the three toms at 11 o'clock, center, and two o'clock, and the bass in the center. We put the snare on the third track, enabling us to isolate it and control it in the mix. Each guitar was assigned its own track, which left two open tracks for the vocals, which were to come later.

We were lucky in the recording; we got most of the songs down by our third take. It is a draining process, because you want to record a mesmerizing performance, yet it's hard to keep the intensity up as you record take after take. We were all a bit nervous about making mistakes. Even so, we captured some energetic, tight versions early on. After finishing a version we'd all gather back in the control room to listen. Little mistakes can be fixed, energy can't. Though not technically perfect, the versions we selected all had an energy that appealed to us. Everything was recorded dry, with the effects to be added in the mix.

It is strange listening to a tape of songs that you perform regularly, for you are not used to them as an outsider. We listened very critically, and went back individually to punch in any flubbed passages.

We finished recording "Brokenhearted" and "One Small Chance" (without vocals) in about three hours. We started "Run Away," but had to stop before we felt good about a take. We resumed the next morning, finishing the basic track for "Run Away" in two hours.

Since we recorded the lead guitar "live" with the band, we only had a few minor guitar overdubs to add. We used the track assigned to the background vocals during parts with no vocals. One of the overdubs was an acoustic guitar, recorded through an AKG-451 (placed near the bottom of the guitar) and sent through a parametric EQ.

We started recording the vocals four days after laying down the tracks. Steve used the Neumann KM56 tube mic set at an omni-directional pattern for my lead vocals (the 360 degree coverage gives the voice room ambience). He put the vocal through the compressor, set at a 4:1 ratio, -3 dB, to control the dynamic range of the voice. For background vocals he used the same mic, set omni-directional, with the same compression features. For backgrounds, the singers balanced themselves before the recording, as it was all being put on one track.

The vocals for "Brokenhearted" and "One Small Chance" went well. We recorded the lead to the first song, then the backgrounds; lead to the second song, and its backgrounds. We didn't run into problems until "Run Away." We took a couple of takes of the song and went to punch in the bridge, but I had trouble matching the intensity. It took a lot of trial and error until I recorded the take where the intensity of the vocals blended with the instrumentals.

After finishing up all the vocal work on "Run Away," we had totally finished our recording. We had our basic tracks, vocals, and overdubs on tape. Now we had to put it all together and make it sound as hot as possible.

Mixing is a process involving continual adjustment. There is an unlimited amount of options you can explore in the mix. The first step Steve took was to set up a basic level for each track. He prefers starting with the drum tracks, moving then to the bass, guitars, and finally vocals. After one track was approximately set, Steve moved to the next, setting that track's levels, and then blending it with the first. This was done for all eight tracks, until a good uncolored working mix was set up.

We wanted to keep the basic instrumentation clear and punchy. The three drum tracks were sent through the parametric EQ. The snare was then sent through the reverb send and through a tape delay, before reaching the reverb chamber and returning to the mix. This gave the snare a rich delayed reverb with a clean attack—a "slap-echo." The rhythm guitar was colored with some delay in all three songs, giving it a slight ringing-chorus sound. Aaron's guitar was similarly colored, except with more delay. In "Run Away," Aaron has a long, slightly distorted solo, which we originally recorded cleanly. To "dirty" it up, Steve ran the guitar track through two amplifiers, one for distortion and the other for chorus. Each amp was mic'ed, and the signal created was then sent back to the mix. This created the distorted live sound very

Inner Ear Recording Studio Listings

Owner: Steven Vavagiakis

Studio Manager: Jane Fuller

Engineers: Steve Vavagiakis, Peter Vavagiakis.

Dimensions of studio: 24x20 w/two iso booths.

Dimensions of control room: 20x18.

Tape Recorders: Otari MX5050-8SHD multitrack, Tascam 40-4, Otari MX5050-B, Sony TC-K81 cassette recorder.

Mixing Console: Tangent Series Four 16x16x4x2 console.

Monitor Amplifiers: Two McIntosh 2100s Crown D-150 for the cue system.

Monitor Speakers: UREI 811As, MDM-4 near field monitors, Tannoy SRM12Bs, and a pair of Auratones.

Echo, Reverb and Delay: Eventide 910 digital delay, Echoplate 11 reverberation plate, Tape delay.

Outboard Equipment: 12 channels of dbx noise reduction, two UREI LA-4 Compressor Limiters, two Orban 622B Parametric Equalizers, UREI 535 graphic EQ, Omni-craft noise gates, Eventide Harmonizer, Eventide 4L201 Flanger, Dual/v-15 Turntable, Jensen Transformer Direct Boxes.

Microphones: Neumann KM 56 (tube), two AKG 451s, D12E, D707E, Electro-Voice RE-20, 1711, four Sennheiser 421s, Shure 57, 58, Sony ECM22P.

Instruments Available: Vintage Steinway Grand, Fender Rhodes, Sequential Circuits Pro-I synthesizer, Drum Sets by Leedy, Slingerland, Gretsch, four Dresden Timpani, Musser Vibraphone, Leedy and Deagan Xylophones, Musser and Deagan Orchestra Bells, Deagan Chimes, Assorted percussion and sound effects.

Video Equipment and Services: Anything required within 48 hours.

Rates: Call for rates, package deals available.

Most recent additions: Sonor six pc. drum set, Oberheim digital drum machine, Arp Omni II polysynthesizer, SDD-3000 digital delay line with nine memories and infinite repeat, two Symetrix noise gates.

accurately, and yet we had total control of the sound since it was all being adjusted in the mix.

The lead vocals were given the same "slap-echo" that the snare drum had. We used the parametric EQ, and boosted the 2 to 3 kHz range to give the vocal more presence in the mix. A harmonizer was used as a digital delay, thickening up the vocals. The background vocals were mixed in a similar way, using the harmonizer a bit more sparingly.

It is important to listen to the mix in a variety of conditions. Steve has three sets of monitor speakers: small, medium, and large. Steve continually switched back and forth among the speakers, allowing us to hear the music coming from different sources. He also varied the volume from soft to loud, to allow us to hear how it would sound at different volumes. This helped us create a sound that sounded good under any playing condition. Rock'n'roll is always better played loud (except if you're my mom), and for this reason it's better to mix it at a lower volume; if it can be arresting at a low volume, it should be even more so loud.

All of the band took part in the mix. At various times we all sat at the board and toyed with the sound. Altogether we spent 8½ hours mixing the three songs. We tried to get a powerful sound with the instruments attacking and the vocals up front. For the most part we all had similar ideas of the sound we wanted—after all, we've been playing the songs for a while. We took our time and tried to make the mix the right one.

Once we finally got the desired mix in all three songs, we arranged the song order on the ¼-inch master. "Run Away," though more drawn-out than the other songs, had the most energy, and really sounded hot. We put it second, though we originally planned to use it last. After putting the songs in order on the master, we made a few cassette copies for ourselves, and walked out with our completed demo!

This article was written 3½ weeks after we completed the demo. This allowed us the opportunity to discuss how we thought it sounded after having taken some time to listen to it and think the whole thing over. All of us hear different flaws in the mix—the drums are too hot, the guitars are too low, the bass is too hot, the background vocals are too low, etc. I think we could have spent 30 hours on the mix, and would still have heard ways to improve it. For our next demo we will mix the songs a few weeks *after* the recording, giving us ample time to become acclimated to the rough mix. Also, next time we will listen back to each individual track more critically as we record it. There are a few subtle mistakes that we could have picked up on. It is important to remember, though, that a demo version of a song is not meant to be the perfect rendition. It is meant to be a "demonstration" of what you can do. If you're an absolute perfectionist in the studio, you could spend all year until you get it right. We are all happy with the tape—we feel that the songs are catchy and the performance is tight and energetic.

In conjunction with this new demo, we are taking new band photos and writing a new bio. The next few months we will be circulating this package to A&R representatives and club owners, trying to establish some professional interest in the band.

Our story really doesn't have an ending. We are a new band with stars in our eyes, and guitars and drum sticks in our hands. If anyone knows any record companies who want to hear the Next Big Thing...

Hacker's Digest

Microprocessors

Some people still conceive of computers as being rather large cabinets with blinking lights and spools of tape, busily crunching numbers for bank accounts and income tax returns. Unfortunately, most computers aren't mainframes anymore; they have become much smaller and their tasks more varied. Other people think of computers as being fairly personal things in compact beige plastic boxes with slots for the disks, running video games and bio-rhythms. But that conception isn't accurate either; it is still far too restricted. The fact is that there are many more computers in the country than people, but most of those computers consist of 40-pin integrated circuits hidden somewhere under your dashboard or inside your CD player calculating carburetion or servo tracking. The point is that the microprocessor is now the dominant force in computing and has taken the lion's share of computer applications.

Understanding the Microprocessor

To properly understand the current and future status of computers, we must properly understand the operation of microprocessors. One of the many industries currently being revolutionized by the microprocessor is the audio industry. Both professional and consumer electronic equipment is becoming much more sophisticated and that complexity is being tucked away inside that 40-pin chip under the guise of programming. As an applications example for next month's column, we'll examine the microprocessor system commonly found inside most Compact Disc players.

In 1969, engineers at Datapoint Corporation designed a computer

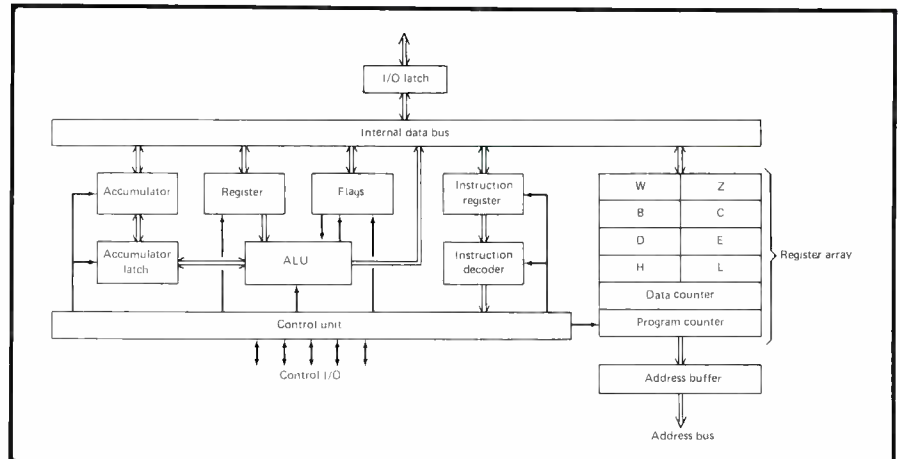


Fig. 1. Block diagram of the microprocessor.

terminal with some arithmetic and logic capabilities of its own to take some of the load off the host. Datapoint asked Texas Instruments and Intel to build a chip to handle that task. Intel successfully built the chip, but its execution speed was only a fraction of what the specifications called for. Datapoint canned it and built a circuit from discrete parts. But Intel saw potential in their chip, they marketed it as the 4004, and the first central processor unit on a chip was born. Today the 8085A, a descendant of the 4004, is a VLSI (Very Large Scale Integration) chip with 6,200 gates on a 164×222 mil chip with 74 instructions in its instruction set, waiting for programmers to begin writing programs to put it to use. It is representative of many modern microprocessors that enable designers to use a generic nucleus to accomplish many tasks with a common hardware scheme—with slightly different interfacing and an appropriate program the same chip can service many applications. The chip may be mass-produced, reducing its cost, and the consumer

winds up with a sophisticated product, at low cost.

A microprocessor is a very simple piece of very high technology. Although architecture varies from model to model, most micros contain pretty much the same subsections with the same internal interconnections. The four main subsections of a micro are the ALU (Arithmetic Logic Unit), CU (Control Unit), registers, and internal bus. The ALU performs all of the arithmetic and logical operations required by the program. It has a set of basic computations such as addition, subtraction, complementation, shifting, and Boolean logical operations such as AND, OR, and XOR (Exclusive OR), through which it can perform any required computation from its basic set of math skills. No matter how tough the program, the microprocessor's ALU breaks it down into simple operations and does the job. (Figure 1 shows a functional block diagram of the microprocessor.)

Every microprocessor has several working registers to handle the

various types of information processed by the device. A register is a temporary memory where data waits to be processed, or upon which the processing actually occurs. For example, many instructions in the microprocessor's instruction set specify the A register (the accumulator) as the place where the data must be located to use the instruction. Pure data, coded data, character data, and instruction data all have their registers to differentiate between them and store them while processing takes place. The four primary registers are the accumulator, instruction register, data counter, and program counter. The accumulator is a data register in which data from memory is acted upon; in an eight-bit microprocessor, the accumulator is an eight bit register. All instruction codes from a program are routed to the eight-bit instruction register; the control unit will decipher these instructions prior to execution. The data counter holds a memory address; the memory address is the location in memory where a piece of data has been placed. Given the address, the microprocessor can find that location, and return with the desired data. With a 16-bit data counter, 65,536 memory locations can be directly addressed by the micro; in other words, 65,536 pieces of data may be stored in the system's memory. The program counter holds the address of the program instruction under execution. Thus, it points to the place in memory where the computer's program is currently working; it is typically set to the start of the program and successively increments step by step as the program executes. Since all 64K of memory is potential programming space, the program counter is a 16 bit register.

The CU (control unit), as the name implies, controls the operation of the microprocessor. It accepts the contents of the instruction register, decodes the instructions, and performs the operation called for—anything from ALU operations and I/O (input/output) to the moving of data—whatever the instruction commands. The instruction set is contained in a ROM (Read Only Memory) which is an immutable library designed as part of the chip. The library exists in the control unit in the form of microprogrammed sub-instructions; the CU uses those microprograms to generate its operational sequences. The control unit

accepts a clock for timing and special control lines for external control; it initiates all micro operations and outputs control lines to inform the system of its own status.

A complex internal bus structure connects the subsystems inside the microprocessor. Data, address, and control lines wire everything together, often with bidirectional lines which permit data to flow in either direction. The internal buses in the chip connect the internal subsections to the outside world through registers, thus transferring data to and from the chip.

Programming

Of course, any microprocessor is just a dumb piece of silicon without its programming. Every micro is designed to respond to a library of instructions called the instruction set; as we know, the various internal operations comprising each instruction are stored in the control unit ROM. The human user accesses that library with a mnemonic given to each instruction, called by his assembly language program, the most fundamental kind of programming in which the mnemonics themselves constitute the program. A mnemonic is a label given to each instruction to remind the human user of the instruction's functions. For example, DCR is the decrement instruction and INR is the increment register instruction. The computer doesn't need those cute names, but it sure helps us people. Although some instructions consist only of the operation code mnemonic, most instructions are data-based so that in addition to the mnemonic, an operand field details the data needed by the micro to complete the operations called for by the instruction. 'HLT' is thus a non-data instruction which tells the processor to stop, while 'SBI data' tells the processor to subtract the given data word from the contents of the accumulator and store the contents in the accumulator. The selection of instructions for the library is made by the manufacturer and differs from chip to chip although some downward compatibility exists among chip geneology. Although instructions differ, the general classes of operations are about the same. Most microprocessors perform the following operations: move data between registers, logical operations such as AND and OR, arithmetic operations such as addition and subtraction, jumps and subroutine

calls and returns, stack, I/O and machine control manipulations, interrupts, and setting and clearing flags.

Given an instruction, hopefully placed properly in a useful context of instructions, the microprocessor hardware dutifully accomplishes the assigned task with the regularity of a heart beat. The instruction cycle divides the execution of every instruction into two parts: fetch and execute. Every cycle begins with the loading of the instruction into the instruction register, called a fetch. The fetch is thus a read operation in which the contents of the program counter are utilized along with the read control signals to search through memory and return with the contents of the specified memory location.

While this is taking place, internal logic increments the program counter in preparation for the next fetch. When the contents are received, they are routed to the instruction register; execution takes place as the control unit finds the instruction in its ROM, decodes the instruction, and carries out the listed microprogram. The basic cycle is thus fetch, increment program counter, decode, and execute. No matter how complicated the task and how involved the program, the specific instructions are acted upon one at a time, broken down into their subinstructions, and executed. Any higher level language such as Pascal or Basic ultimately filters down to the assembly language level and then to the micro-instructions in the control unit ROM. Similarly any applications program from Wordstar to Donkey Kong ultimately utilizes the microprocessor in the same way.

A microprocessor is thus organized as four hardware subsystems, with a library of instructions, obeyed with cyclical regularity. A microprocessor is thus, in some respects, a fairly simple piece of technology in that it merely accomplishes very simple operations one at a time. Its power lies in its speed. With a clock frequency of 6 megahertz or more, the combined result of so many simple operations performed so quickly can make the chip do some pretty intelligent things. One of those intelligent applications is running all the circuitry contained in a Compact Disc player—and believe me, there's a lot more going on than in an L.P. record player. Next month we'll take a look at how this brainpower is accomplished.

Studio Notebook

For the past few months this column has featured the winning designs from our first-annual-and-I-don't-think-I-ever-want-to-try-this-again Design-A-Studio Contest. Our congratulations go out once again to our top three finalists, and we hope all of MR&M's readership has been able to gain a better understanding of some of the problems (and their solutions) in studio design from the entries printed within these pages. If you've had half as much fun drawing up your entries as we've had judging them, then we've had twice as much fun as you.

While there can be only so many prizes in any contest (in this case there were only so many companies that we could con prizes out of), there are times when peoples' efforts deserve some recognition even if they didn't finish in the money. The Design-A-Studio competition is now history, but we'd like to use this month's installment to impress upon everyone who followed this contest that we had a lot more winners than we could possibly afford to award prizes to. Some real class and imagination was shown by the "also-ran" entrants as well. This month it's time for a few of them to take a turn in the spotlight.

For starters, we'd like to confer an official Modern Recording & Music 'That's More Like It!' award to Mr. Fred R. Burgess of Broadway, North Carolina, for sticking almost religiously to the specified design parameters originally given for the sample basement layout and still ending up with a nice, workable plan (see Figure 1). Fred has developed a complete and self-contained recording business complex in his basement drawings that includes a reception area, hard surfaced and non-reflective studio areas, control room, repair shop, storage facilities, drum booth, isolation/vocal booth, and the ever-popular studio toilet.

Fred was one of the few who tried a "sideways facing" control room to better utilize the space he had


available instead of the more conventional directly forward focus. There is absolutely nothing wrong with this at all. Just keep your mixing position at the balance point of an equilateral triangle directly opposite the

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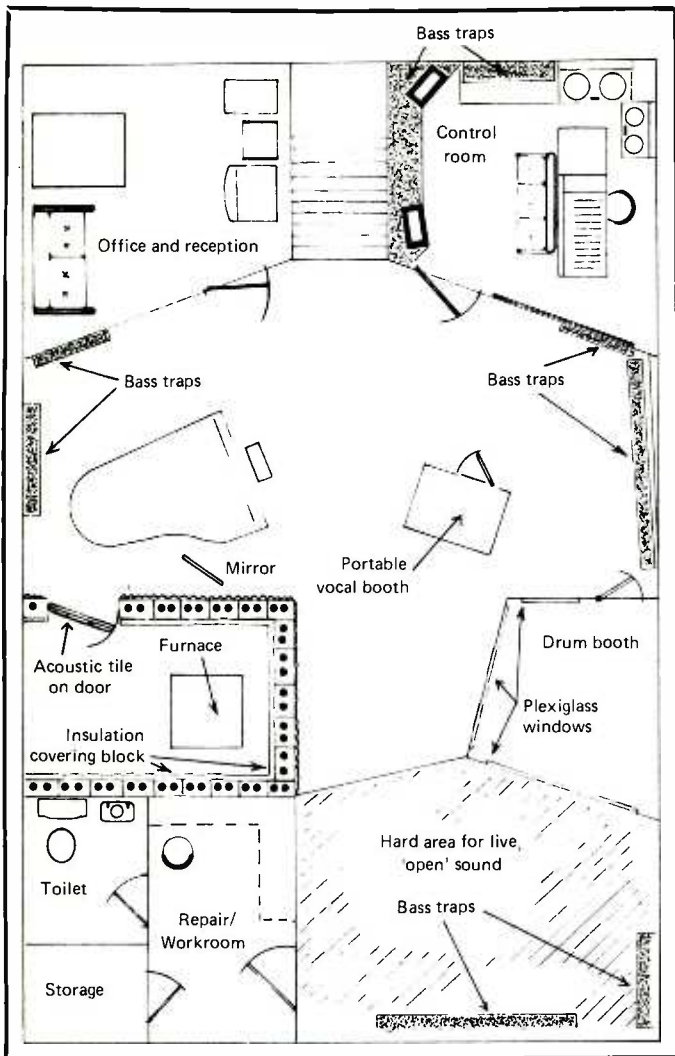


Figure 1. Basement design submitted by Fred R. Burgess.

angle of your monitors, and things will be ducky. Fred has also provided a portable vocal booth that can be shuttled into a corner when not in use. I might quibble a tad over his 2-ft. x 3-ft. exterior booth dimensions (that's smaller than an efficiency apartment shower, campers!), but maybe it's just my claustrophobia talking. However, whatever size booth you decide to build, you can thank Fred Burgess for giving you the idea. (I also loved the rear view mirror for the piano. Nice touch, Mr. Burgess!)

Bless you, Fred, for not blowing off the furnace problem! Masonry block lined with insulation is just the ticket we were looking for. Everyone else who tried to isolate the unit was building plywood and stud walls around the furnace that would have less mass and would end up being more expensive than the concrete block. Much more like it, Fred!

Using a great deal of free materials, which Fred suggests can be obtained by dismantling an abandoned building in your area, his final cost estimate for such a remodeling project was about \$2850. By my figuring, if all materials had to be purchased over

the counter, the final dollar total could possibly be twice as much. Once again, this is not exactly pocket change, but look at the results you can achieve. If you need to cut some dollar-corners, you can begin by dumping the rest room (no pun intended), cutting the plexiglass windows down to just two sides on both the drum and vocal booths, and using hollow core doors into the workshop and storage area instead of the solid core units that Fred has listed. Be sure to leave a solid core door leading into the control room and don't even think about cutting out the bass traps to save a few bucks. (Also, don't even think about calling me when it comes time to haul that baby grand down those stairs. If someone asked me real nice, however, I might be strong enough to hold the door open for you.)

Speaking of bass traps, Jack Gibson of Ellenton, Florida, sent us an idea that we thought was highly deserving of our special 'Why Didn't I Think Of That' award (see Figure 2). If you can't afford to raise the scratch for extended membrane absorber bass traps, why not turn your thoughts toward that old carpeting gathering mold in the garage? A few 2 x 4s, possibly even 2 x 2s, a little scrap carpeting, a handful of hanger hooks, some wood screws and wire, and—voila!—instant bass traps that can be hung from your studio's ceiling. It'll take several of these cookies and you might have to do some experimenting to find the best position, but when you're done you can while away your time adding up all the money you saved in the process. Thanks, Jack!

Lack of space in the previous installments prevented us from going into the detail we would have liked on some of the entries featured. Wall construction in particular has been brushed over to the point of merely saying, "This wall starts here and ends up over there..."

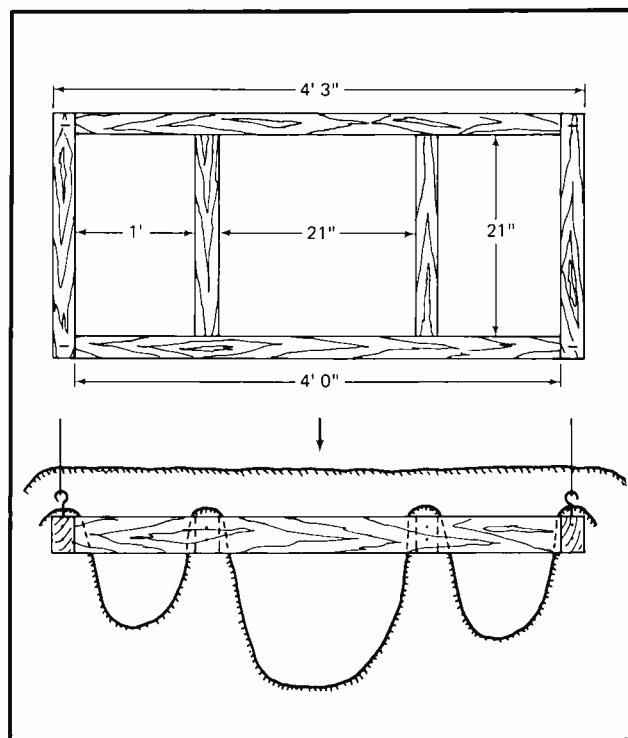


Figure 2. Economy bass trap submitted by Jack Gibson.

somewhere." We'd prefer to remedy this by offering our revered 'Maybe I'd Better Think About This And Do It Right' award to Mr. Don Chiles of Carmichael, California, for the wall detail drawings he submitted with his studio plan. Don's design was chosen as representative of the many excellent wall construction schemes that we received. While I really don't feel there is an absolute right or wrong way to go about designing and building studio walls (how much you have budgeted to spend being one of the chief considerations), this arrangement gives you an idea of the "materials wafering" concept that you may want to try to shoot for.

Figure 3 shows cutaway views of two walls: one to be built over an existing outside wall and one to be built

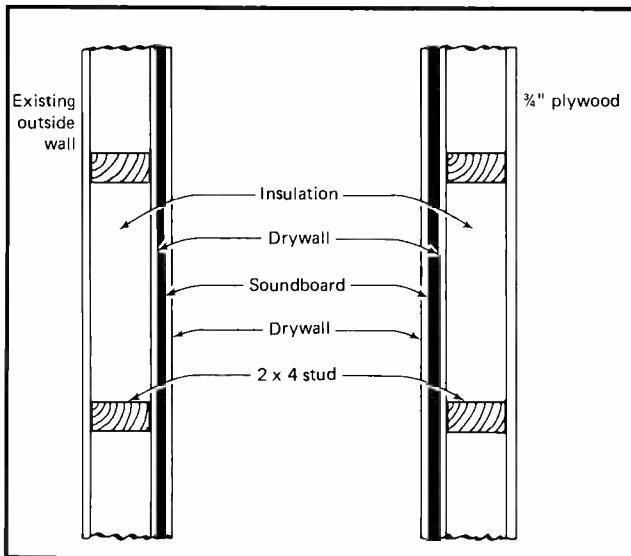


Figure 3. Outside and inner wall construction details.

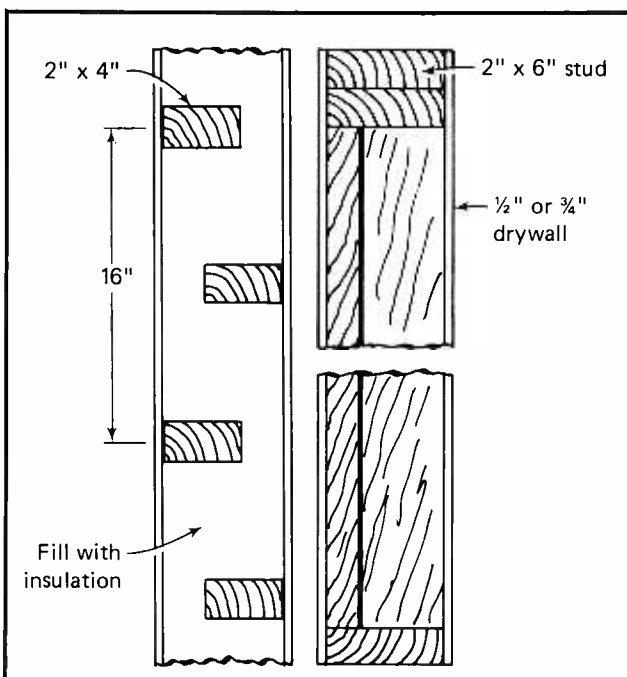


Figure 4. "Staggered-stud" control room wall construction (top and side view), not including materials "wafering" for sound treatment of outer wall surfaces. Submitted by Don Chiles.

free-standing. Don says that the drywall used may be either 1/2-in. or 3/4-in. depending on your budget and space available. In the case of both outer and inner wall, be sure to caulk-seal all perimeter edges—top, bottom and corners.

For maximum separation, Don has also submitted a "staggered-stud" wall design to be built between the control room and the rest of the studio (see Figure 4). This plan will give you some of the same isolation benefits that two separate walls with a dead air space between them would, but at much less cost. Only a single layer drywall covering is shown in Figure 4, but a little wafering of different materials along both sides of the wall is still desirable. If money is tight, a sheet of soundboard and 1/2-inch drywall on both sides will get you by fairly well.

Got a few extra bucks? Then instead of making both sides of this wall identical, do it up right and switch one side to a double layer of drywall. Even the best-built walls are going to vibrate in response to the sound you're trying to confine in one room or area. If both sides of a wall are vibrating at the same frequency, the sound transmission through the wall will cause you fits. With identical wall surfaces you have, in effect, created an acoustical "window" to let whatever frequency is resonating through both sides of the wall come warbling through. Increasing the mass of the wall can sometimes help, but is not necessarily cost-effective.

A much simpler solution is merely to keep the opposing sides of the wall different thicknesses. There will still be some resonance, but not both sides at the same frequency. Window closed, problem solved. Now, just fill the center space with insulation, caulk-seal all the joints and edges, and you're ready to fly!

Rounding out this installment, I'd like to give some special recognition to some special people. The only real bummer about this entire competition is that there have to be entrants who will no doubt see themselves as losers just because they weren't picked as the top winners. Every single entry we were sent had good things that could be said about it, in some cases a lot of good things. As I stated some months ago, Modern Recording & Music's readers could design a studio for me anytime.

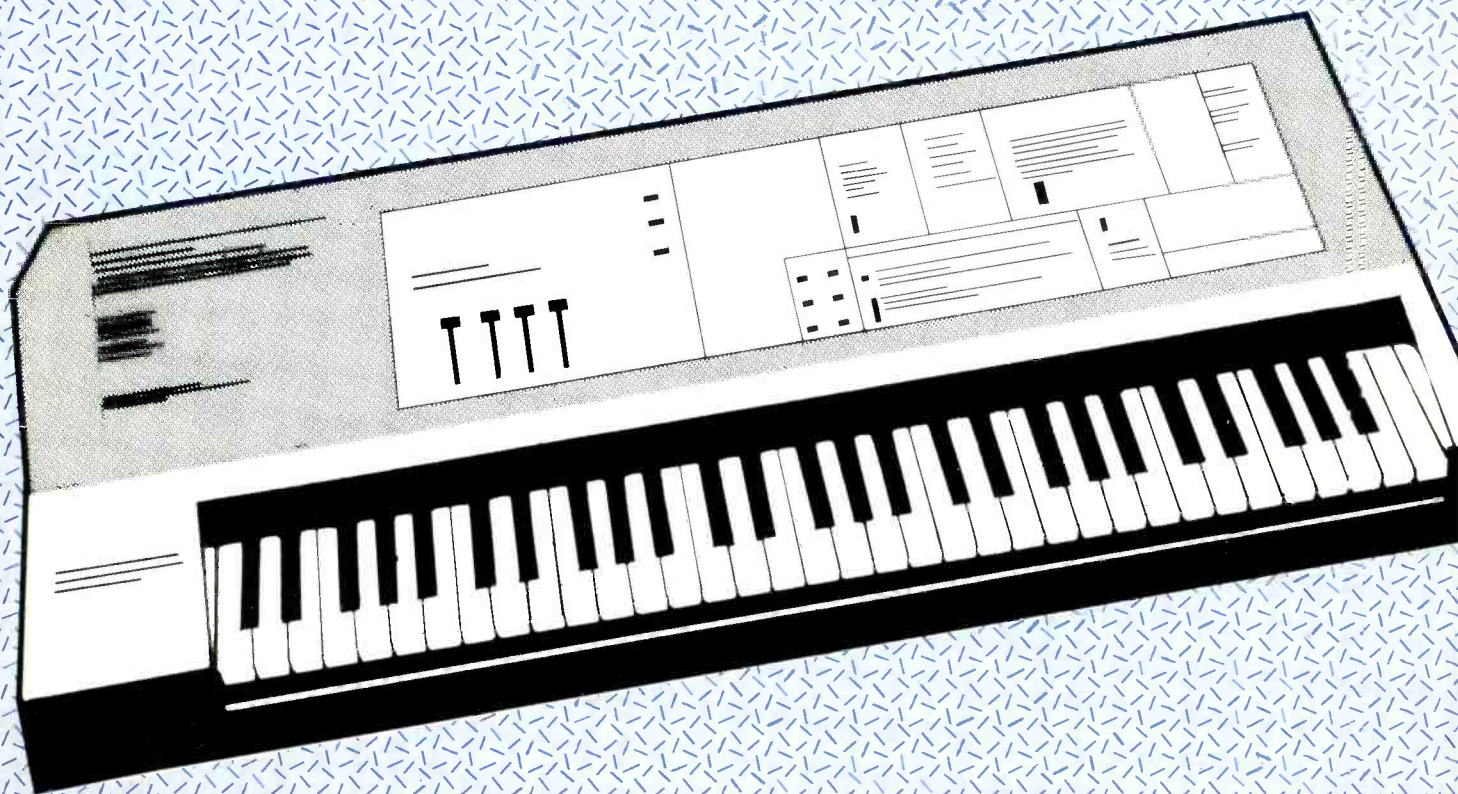
Three entries in particular stand out as missing the mark by only the tiniest of whiskers. Not only were the designs sound, well planned and highly imaginative, they were neatly presented, well documented and obviously representative of many hours spent hunched over the kitchen table with a #2 lead pencil. So to Eddie Hanna of Medford, New York, Lyndon Ketterman of Grandview, Missouri, and Rick Shriver of McConnelsville, Ohio, we are honored to present our most select non-prize, the coveted 'I Wish We Would'a Had More Prizes' award. For what it's worth, you've also won the respect and admiration of all the folks on this end as well. (Yeah, Yeah, I know, you'd rather have won the speakers, right?) Our congratulations to all of you for a job very well done.

So that's about it! Wasn't it fun, like I said it would be? I've already asked the powers that be at MR&M about running the contest again in the future and Wow!, did they get excited! They said there would be some conditions before they'd try it a second time, but I'm staying ready just in case hell does freeze over. I mean, what the heck, they didn't exactly say no, did they?

MODERN **RECORDING** *& MUSIC*

Looks At

KEYBOARD SYNTHESIZERS





Keyboard Synthesizers

On the following pages, we have compiled a directory of keyboard synthesizers. In all cases, the information supplied comes from the manufacturers themselves. This, of course, includes all pricing information shown. Each manufacturer was limited to a maximum listing of five products.

We believe that we have attempted to contact every U.S. manufacturer or distributor of keyboard synthesizers. Nevertheless, you may notice that some companies are not represented. We assure you that this oversight is unintentional and may have resulted from our being unaware of a given company (due to the recent proliferation of synthesizer manufacturers) or a company's inability to deliver the necessary information to us by deadline. If we missed anyone, we hope to catch them next time.

Model Number	Number of Keys/Octaves	Number of Voices	Mono/Polyphonic	Modular/Wired	Sequencer Capability	Programmable	Interface Capability	MIDI Equipped	Memory Amount	Price \$	Manufacturers Comments.
Dyno-My-Piano											
Signature	73/6		P	W	N	N	Y	Y		4000+	Modified Rhodes keyboards for live, studio, and video use.
Electro-Harmonics											
0410	25/2	1	M	W	N	N	N	N	-	229.00	A portable battery-powered analog synthesizer with echo.
E-mu Systems, Inc.											
6018	61/5	8	P	-	Y	Y	Y	Y	512k	-	EMULATOR II. Digital sound sampling, velocity sensitive keyboard with analog sound modification.
Europa Technology, Inc. (PPG)											
Wave 2.3	72/5	8	P	W	Y	Y	Y	Y	*	8995.00	*87 programs, 20 combos, 12-bit sound fidelity, Each voice separately programmable, w.sep.outputs.
Fender Musical Instruments											
Chroma	64/5.33	50	P	W	Y	Y	Y	N	16k	5295.00	Programmable signal path and filter configuration. Weighted wooden keyboard.
Polaris	61/5	132	P	W	Y	Y	Y	Y	16k	1995.00	Velocity sensitive keyboard, extensive drum machine interface.
Kawai America Corporation											
SX210	64/-	8	P	W	N	Y	N	N	32	1595.00	-
KORG											
Poly-800	49/4	8	P	W	Y	Y	Y	Y	64	795.00	Has 12 sec. tape interface. AC or battery operation. 3 six-stage digital envelopes. Stereo chorus.
Poly-61	61/5	6	P	W	Y*	Y	Y*	Y*	64	1495.00	*MIDI retrofit kit option. 8 sec. tape interface. Has arpeggiator, chord memory.
Poly-SIX	61/4	6	P	W	N	Y	Y	N	32	1995.00	8 sec. tape interface. Has chord mem, arpeggiator, prog. effects.
Mono-Poly	44/3.5	4	P	W	Y	N	Y	N	-	995.00	Preset sync and cross-mod effects. Arpeggiator, 2 env. generators.

Model Number	Number of Keys/Octaves	Number of Voices	Mono/Polyphonic	Modular/Wired	Sequencer Capability	Programmable	Interface Capability	MIDI Equipped	Memory Amount	Price \$	Manufacturers Comments.
MOOG Electronics											
Memory moog Plus	61/-	6	P		Y	Y	Y	Y	100	-	Polyphonic sequencer programmable foot switches, program chaining.
Source	-/3	2	M	-	Y	Y	Y	-	16	-	
ROGUE	32/-	2	M	-	N	N	Y	N	-	-	Sample and hold, auto triggering.
Taurus	-/1.5	2	M	-	N	N	Y	-	-	-	

Music Technology, Inc.

SIEL-DK-600	61/5	6	P	-	Y	Y	Y	Y	-	1295.00	-
SIEL-OR-400	49/-	6	P	-	N	N	N	N	-	595.00	-
SIEL-PX-JR	72/-	5	P	-	N	N	N	N	-	595.00	-
BIF-DNF	-/-	6	P	-	Y	Y	Y	Y	-	-	By Crumar
Crumar-OR-15N	61/-	-	P	-	N	N	N	N	-	1295.00	-

New England Digital Corp.

Synclavier II	76/-	128	P	M	Y	Y	Y	Y	1M	20,000-50,000	Uses Winchester storage. A total computer music system.
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Oberheim Electronics, Inc.

OB-8	61/5	8	P	W	Y	Y	Y	Y	120	4545.00	Has 120 patches, 12 splits, 12 doubles.
XPANDER	-	8	P	W	Y	Y	Y	Y	100	2995.00	Has 100 single patches, 100 multi patches.

For more information on Oberheim products see their ad on page 15.

Octave-Plateau Electronics, Inc.

VPK-5	61/-	8	P	M	Y	Y	Y	Y	-	4595.00	Voyetra 8 optional module has 16k ram, 32k ROM.
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Passport Designs

MX-5	61/5	16	P	M	Y	Y	Y*	N	64k	1270.00	*Works with Apple computers. Soundchaser model. Includes 16-track seq. software.
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Model Number
 Number of Keys/Octaves
 Number of Voices
 Mono/Polyphonic
 Modular/Wired
 Sequencer Capability
 Programmable
 Interface Capability
 MIDI Equipped
 Memory Amount
 Price \$
 Manufacturers Comments.

Roland Corporation US

Juno-106	61/5	6	P	W	N	Y	Y	Y	128	1095.00	-
MSQ-700		16	P	W	Y	Y	Y	Y	*	1195.00	Digital keyboard recorder. *6500 notes.
JX-3P	61/5	6	P	W	Y	Y	Y	Y	64	1395.00	Extra programming with opt.PG-200.
Jupiter 6	61/5	6	P	W	Y	Y	Y	Y	32*	2995.00	*presets, 48 patches.
Jupiter 8	61/5	8	P	W	Y	Y	Y	Y	*	5295.00	*64 patches, 8 preset splits.MIDI outputs optionable with VO-8.

Seiko-Kamen Music Dist.

DS-202	61/7	2	P	M	Y	Y	Y	N	1499	749.50	Can be expanded using D5310 synth module or D5320 sequencer module.
DS-101	61/7	1	P	M	N	Y	N	N	-	599.00	Can be expanded with DS310 synth module.

Sequential Circuits, Inc.

Prophet -5	-/5	5	P	W	Y	Y	Y	N	120	3995.00	120 Programs.
610 Six-Trac	-/4	6	P	-	Y	Y	Y	Y	800-notes	1095.00	Multi-timbral, six different instrument sounds can be recorded together.
Prophet -TB	76/-	8	P	W	Y	Y	Y	Y	128	5895.00	Pressure and velocity sensitive keyboard with programmable split.
600	5/-	6	P	W	Y	Y	Y	Y	100	1995.00	
AS05	61/5	8	P	-	Y	Y	Y	N	1200	1495.00	Requires Apple IIe with 64k,monitor and one disk drive.Includes programs for computer.This is a polytimbral synthesizer.

360 Systems

Digital Keyboard	49/-	8	P	W	Y	Y	Y	Y	3600-		User-selected digital sound recordings on plug-in chips. Holds 32 polyphonic instruments at once. Not a true synthesizer.
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Yamaha International Corp.

GS2	73/6	16	P	W	N	N	Y	Y	16	6900.00	Touch sensitive keyboard. Uses FM digital synthesis.
CS0211	32/2.5	1	M	W	N	Y	N	N	0	275.00	Programmable portable micro-synth. Weights 3 lbs, 5 oz.
DX9	61/5	16	P	W	Y	Y	Y	Y	20*	1395.00	*Has 20 presets expandable to 160. Programmable FM digital synth.
DX7	61/5	16	P	W	Y	Y	Y	Y	32	1995.00	Touch sensitive keyboard. RAM and RAM cartridge memory. Programmable FM digital synth.
CE 25	49/4	8	P	W	N	N	N	N	20	1495.00	Touch sensitive keyboard. FM digital synth.

For more information on Yamaha products see their ad on page 21.

How To Buy A Keyboard Synthesizer

Keyboard synthesizers, once relatively rare and expensive, are now ubiquitous—even department stores carry highly sophisticated keyboard instruments. While it's great that we have so many instruments to choose from, trying to make a decision on which one to buy has now become more complicated than ever. What's worse, many buyers are rightfully fearful of the obsolescence factor; will what they buy today be outdated in a year (or even a month)?

This article is intended to clarify the various possibilities and help you make an intelligent buying decision. Before we get into specifics, though, let's dispel a few myths.

- **Keyboards become obsolete virtually overnight, so I might as well wait until one comes along that has some real staying power.** Well, if you wait for the perfect keyboard to come along, the one which everyone agrees is *The Keyboard*, you're going to have quite a wait. Granted, improved instruments are constantly being introduced, but that does not necessarily diminish the validity of older instruments. Many keyboard players are still wailing away on a Minimoog, introduced well over a decade ago yet still possessing an amazingly clear and pure sound (some would say that a better sounding analog synthesizer has yet to be invented). If an instrument makes great sounds when you buy it, it will continue to make those great sounds in the future. Newer machines may offer greater flexibility, or improved cost-effectiveness, but a good sound is a good sound is a good sound.

- **Monophonic synthesizers are a dead issue. Polyphonic synthesizers are where it's at.** A polyphonic instrument allows you to play several notes at a time (usually between six and eight notes); a monophonic synthesizer only plays one note at a time (although some monophonic models offer limited polyphony). Now, if I could only have one synthesizer, it would be polyphonic. But if I could only have two synthesizers, I would rather have one mono and one poly synth than two polys. For those who question whether an instrument that is not capable of playing chords is valid, all I can say is ask a trumpet, flute, or sax player!

Mono and poly synths are quite different; mono instruments often create more complex individual timbres, while poly instruments—although allowing you to create more notes at a time—may create less interesting and complex timbres for those notes. Also, many polyphonic synthesizers are computer-based,

whereas monophonic synthesizers are not. Since the computer scans the keyboard in a poly instrument, sometimes there can be a delay of five to 10 ms between the time you play a note and the time you hear it. With a non-computer controlled instrument, there is virtually no delay. While many people can't hear these tiny delays, those with exceptionally fast "chops" sometimes prefer the immediacy of older, monophonic synthesizers.

- **Digital synthesis is the only way to go.** I cannot understand why some people feel that analog and digital technology are in competition with each other. To my ears, they each produce very different sounds— analog synthesizers tend to sound "warm" (for lack of a better word), while all-digital synthesizers offer a more crystalline sound. Unfortunately, they both have their own drawbacks as well as advantages; in particular, most digital synthesizers I've heard are relatively "dirty" sounding, although I've also heard some analog synths that were rather hissy and noisy as well. Overall, I feel that eventually most musicians are going to need an analog synthesizer and a digital synthesizer to obtain the full range of sounds required by today's music, just as guitarists often alternate between electric and acoustic guitars.

Incidentally, many synthesizers are *hybrid* units that use analog sound generators controlled by digital technology. In this case, the digital section doesn't generate sound, but instead, controls the analog portion to offer features such as programmability. I would consider these essentially "analog" units, since that's what generates the sound. However, still other synthesizers generate sounds digitally and then modify them with analog circuits. So the line between "analog" and "digital" is becoming less distinct all the time. But really, the concept of analog vs. digital is of more interest to circuit designers than musicians. Do you really care how a sound was generated as long as you like that sound?

- **Because computer technology keeps costing less and less, newer low-cost synthesizers are every bit as good as older, more expensive synthesizers.** Substitute "almost as good" for "every bit as good," and I would agree. But you don't get something for nothing in this world, and synthesizers are no exception. The music industry is extremely competitive, so if two synthesizers appear identical but have very different price tags, investigate further... there's bound to be a reason for the cost disparity. Also, remember that the

most expensive part of an instrument is generally the packaging and other mechanical parts; even if the cost of a microprocessor falls from \$10 to \$2.50, that's not going to make much of a dent in the list price of an instrument.

Now that we've covered some background, here are some specific features to consider when deciding which synth is best for you.

Voice Complexity. Many years ago, Bob Moog thought it would be a good idea to hook up a couple of voltage-controlled oscillators (VCOs), control the timbre with a voltage-controlled filter (VCF), control the dynamics with a voltage-controlled amplifier (VCA), and control the VCA and VCF with envelope generators (these varied the VCF cutoff frequency and VCA gain in a predictable, easily-set way). This combination of elements forms what is called a *voice*, and is capable of synthesizing a huge variety of common (and not so common) sounds. Although the government did not pass a law mandating that all synthesizers had to follow this voice scheme, they may as well have; through either laziness, lack of imagination, or perhaps because Moog had indeed hit on a "magic" combination, virtually all present-day synthesizers use the VCO-VCF-VCA-plus-envelope-generators voice scheme. Some of the lower-cost models use one envelope generator to control both the VCA and VCF, or use only a single oscillator. Both of these omissions hinder your ability to make very "fat" or precisely articulated sound; still, you can achieve

some very fine sounds with even fairly simple synthesizers.

Beyond the basic voice, other synthesizers include "extras" which help you give more personality to the sound. Some of my favorites are:

- *Sync.* This locks the frequency of one oscillator to a second (or perhaps third) oscillator. While a detailed explanation of sync is beyond the scope of this article, suffice it to say that sweeping a synced oscillator produces dramatic sounds which resemble a cross between flanging and highly resonant filtering. I have found sync particularly useful for obtaining plucked instrument sounds.

- *Portamento.* This adds a variable amount of glide between notes, producing the same type of effect as a slide trombone (which also glides between notes). Portamento is very handy for voice patches, as well as for synthesizing steel guitar and the sounds produced by other fretless instruments.

- *Polyphonic modulation (vibrato).* When you attempt to synthesize, say, a string section, it sounds kind of cheesy to have every note being vibratoed at the same rate...after all, no group of humans playing together is going to vibrato each instrument at exactly the same rate. With polyphonic modulation, each note will receive its own slightly different vibrato rate. This is not a particularly common feature, but musically speaking it's highly valid.

Left-hand Controllers. Most synthesizers let you add vibrato or pitch-bending via controllers designed for left hand manipulation. Some models use wheels, some levers, some pressure pads, etc. Check out which controllers feel most natural to you, as well as whether the controllers can be assigned to different functions. For example, on a simpler synthesizer the vibrato controller may only affect pitch. With a more complex model, you might be able to choose between selecting pitch for all oscillators (or one or two oscillators only), vary the filter frequency, and so on.

Incidentally, some people who play polyphonically have both hands on the keyboard at all times and therefore don't pay much attention to the left-hand controllers. This overlooks much of the synthesizer's potential—the synthesizer can be an incredibly expressive lead instrument if you use the controllers sensitively and subtly. Should you find yourself falling into the "two-hand trap," try using your left hand to vary dials and controls only, and play leads with your right hand. You might be surprised at how expressive a synthesizer can be if you use your left hand to introduce subtle sonic variations.

Touch Sensitivity. Touch sensitivity is a hot topic these days (hats off to Panasonic, by the way, for introducing the relatively low-cost touch-sensitive keyboard used by several manufacturers). Actually, there are two types of touch sensitivity: velocity sensing, which detects how fast the key is struck and therefore controls volume; and pressure sensing, which determines how hard the note was hit (or in some cases, provides an "aftertouch" where you can press down harder once a key has been played). Most keyboards that are touch sensitive include only velocity sensing, and monophonic velocity sensing at that. (With true polyphonic velocity sensing, each note will have its own dynamics. With monophonic velocity

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sensing, each group of notes you play simultaneously will have an overall dynamic.) Touch sensitivity does add to the cost of an instrument, but those who have played on a touch sensitive keyboard are often reluctant to return to the non-touch-sensitive variety. Note that with few exceptions, touch-sensitive keyboards are not as responsive as, say, a piano, and that you will need to acquire additional technique to get the most out of a touch-sensitive device.

Knob Control vs. Parameter Control. With knob control devices, you simply turn a knob or flick a switch to change a particular sound. With parameter control synthesizers, you usually have a numeric keypad (like a calculator) or a bunch of switches that let you call up a certain parameter (such as filter cutoff, VCO octave range, and so on). After calling up the parameter, you then use either a single knob, or perhaps a pair of switches, to alter this parameter.

Parameter control greatly reduces cost compared to knob control devices. However, as someone who does a lot of left-hand control variation in real-time, I find parameter control devices frustrating; to me it's well worth the extra bucks to be able to quickly change patch settings. Also, creating new patches from scratch can be a somewhat tedious process as you bounce back and forth between parameters and punch numbers on a keypad. Still, if cost is your primary consideration, then a parameter control device is probably the best way to go.

Hiss and Distortion. Many synthesizer manufacturers do not pay sufficient attention to low-noise design. Granted, the VCA section acts like a noise gate, so in most cases noise will not be a problem; still, for some patches noise can be pretty objectionable. There is an easy way to test how noisy a synthesizer really is: Select the waveform with the least amount of harmonics (sine or triangle works well), open the filter up full (highest possible cutoff frequency), and play in the bass range. Since you don't have a lot of high frequencies covering up the hiss, the hiss will appear more prominent.

Also check for distortion. This time, select the brassiest, loudest waveform (usually sawtooth). Crank the filter cutoff up to maximum, and play some complex chords; the notes should sound smooth and be relatively free of break-up. It is important to listen closely to the purity of sound, since what sounds clean on the busy floor of a music store can sound pretty dirty in the clinical confines of a recording studio.

Programmability and Cassette Interfaces. Most polyphonic synthesizers are programmable, meaning that once you've come up with a sound that you really like, you can punch a button and store that sound in the synthesizer's memory. If you fill up the memory, you can then record the programmer data on cassette via the synthesizer's cassette interface (these work just like the ones in home computers). Some synthesizers store 16 patches, some 32, some 64, some 120, and so on. While it is certainly convenient to be able to store lots of programs, don't get sucked into the "rock'n'roll arms race" that says more is better. A good-sounding, well-built, easy-to-play synthesizer

that stores 32 programs is a better choice than a noisy synth that stores 64 programs.

MIDI Interface. There's a lot of hype and a lot of controversy around MIDI (Musical Instrument Digital Interface). Simply stated, MIDI allows for computer-controlled musical instruments to "talk" to each other over a common communications bus, just like big computer systems. Thus, a computer could control a number of MIDI compatible devices. For example, if you're starting to play a new song, the computer could call up the right rhythm on your MIDI compatible drum machine, select the desired patch on your MIDI compatible synthesizer, and start the desired sequence on your MIDI compatible sequencer.

So far so good. So why the controversy? Well, at one extreme some people think that MIDI is the greatest thing in the world, will bring synthesis to the masses, and create instant nirvana for composers. At the other extreme are those who feel that the MIDI interface is slow, full of bugs, and generally a giant hype. My position is somewhere between these two extremes, since I feel that both sides have their points: Yes, MIDI does have incredible potential, and yes, it has some bugs. So what else is new? This is the first time the music industry has attempted to adopt a standardized specification on such a universal scale; manufacturers are going into totally uncharted waters, so it's not surprising that some problems would crop up along the way. Yet the basic concept behind MIDI is sound, and already, certain products can be used together with a high degree of reliability. If the instrument you want is MIDI compatible, great... I don't think you'll regret having a MIDI interface built into your synth, and MIDI does not add all that much to the cost of an instrument anyway. If the keyboard you want does not have MIDI, that's not necessarily the end of the world—although if MIDI takes off in the way that I think it will, you might regret not having MIDI a year or two on down the line.

In any event, MIDI is here, MIDI can work, and it deserves your support. Be patient when you discover bugs, and rest assured that engineers at many companies are working very hard to realize MIDI's full potential.

Summing Up. Synthesizers are complex instruments, so don't expect to become an expert after reading an article like this. One could easily write a book about how to choose and use a synthesizer (in fact, I currently am), and unfortunately a short article has to leave out more than it can include. But remember, the final arbiter is your ears and your budget: Set a budget; that will narrow down your choice right there. Listen to the synthesizers that fall within your budget range and start the comparison shopping process. Specs are important, but you can't play specs—so place your primary emphasis on choosing an instrument that has a good sound and "feel."

Finally, no matter what synthesizer you buy, remember that next month someone is bound to introduce one that sounds just a little bit better or costs just a little bit less. Don't let that discourage you; if you bought a synthesizer that sounds good, it will still sound good tomorrow, next month, next year, and maybe even next decade.



jeff tamarkin
with linda cortese

SHELLY PALMER

Shelly Palmer makes music that is not supposed to be noticed. Yet for his services, Palmer is paid enormous sums of money. And, to complete his task of going unnoticed, he utilizes production techniques on a par with those used for nearly any state-of-the-art pop recording you can name. Palmer, you see, provides music and effects for television commercials.

Palmer, only 26 years old, runs one of the most successful independent music production companies in New York. Some of his many clients include AT&T, Casio, Jif Peanut Butter, NBC Radio Network, Meow Mix Cat Food, Renault, Sony Video, WABC-TV, and many others. He can create two complete productions from conception to fully mixed spot in a single work day and gross more income in that one day than many of us do in a year.



Palmer's primary instrument is the synthesizer, and he has familiarized himself with the instrument inside and out, having initially become infatuated with one of the first Moog units some 15 years ago. But he is more than just a synthesist; Palmer is a consummate musician, composer, computer whiz, and producer as well. Plus, he is a businessman with the acumen to turn his creative skills into big bucks.

Palmer's exposure to music reaches back to his first years, when he was trained as a classical musician. His father owned a music store on Long Island, and it was there that Palmer first encountered Mr. Moog and his machine. From that moment on, Palmer decided he wanted to know what made those things tick.

The fact that he has done so with more prowess than even the most celebrated of pop musicians becomes immediately noticeable when Palmer demonstrates his wares at his New York studio, compressed into a small room in an East Side apartment. Palmer understands the inner workings of his tools in the same way a heart surgeon does the human ticker. And he has learned how to apply his knowledge to that most omnipresent of media, TV.

Using computer programming to help him flesh out his musical ideas, Palmer has become an acknowledged master of the art of subconsciously grabbing the viewer/listener's attention. By weaving his under-30-second pieces in with "Buy this now!" voice-overs and striking visuals, he provides the missing link that keeps one drawn to the tube when one would otherwise be grabbing a beer.

Because some of the tools Palmer needs for his work have yet to be invented, he can often be seen inventing them. Some of his creations, such as the Master Click Program for simplifying film math, are quickly acknowledged by his peers as innovations in the field.

Still, above all, Palmer is a musician, as devoted to his craft as any big-name recording artist. While his forte is computer music, he is equally adept at performing classical music on acoustic instruments or producing contemporary pop music (he is presently producing an LP for a female vocalist). Palmer is an advocate of the theory that computer instruments can be humanized, and that the musician must play the

You can get one of those Casio things out of the store, press a button, and you're playing music. It's the video game of the music business. I hope they make a gazillion of them. Everybody's walking around playing synthesizer music and that can only help the industry.

machine and not vice versa. With assets like Shelly Palmer's, there's no doubt about who's in control.

Modern Recording & Music: You are both a musician and a technician, yet you are best known for your work with television commercials. How would you describe what you do?

Shelly Palmer: I'm a composer/producer, but Shelton Leigh Palmer & Co. is more than that. Its primary function is to sell my talent as a composer, but it also sells my talent as synthesist, computer programmer, entrepreneur, advertising type, marketing consultant, and so on. It's gotten bigger than I expected it to. The thing we're most known for is our high technology production techniques, and our ability to fix and save all sorts of production problems that come up in the jingle business. The jingle business is very different than the film business or the record business in that the attainment of maximum flexibility at all times in the production is very important. You never know when some client is going to walk in and say, "You hear that little thing right there? I hate that." When they do that—and it happens on every single job—you have to, without going to great expense, change it. Working with film and video tape formats, and working in the different audio formats, becomes part of the craft, and there are ways to figure out how to work better with things such as SMPTE Time Codes, digital recording techniques, etc.

MR&M: How did you get involved in the jingle business as opposed to making records, which you are certainly capable of?

SP: I am working on a record now. But the thing is that I wanted to be a composer making money in my lifetime and I don't come from a very wealthy family; we were a comfortable, middle-class suburban family on Long Island. It dawned on me that the equipment I wanted to buy was incredibly pricey. The record business differs from the jingle business in that first you invest a lot of money and then if it sells, the remuneration is great. But I'm told that's a one in a million shot. In the jingle business you get paid, period. Whether the product sells or not, you've been paid; and if the agency likes what you do, you get work. So I went into the jingle business for the money, and it turns out to be the most intelligent thing I could have done. The amount of craft depends on how much time you put into it, and I've spent thousands of hours in the studio. I have counterparts in the record industry who listen to my stuff and say, "The sonic quality on this is intense! How do you do that?" And the answer is that if you spend as many hours in the studio as I have, you might be able to do it too. I spend 25 hours in the studio on a slow week. I've been in and out of studios since I was 12 years old and have been producing solidly for the last four or five years.

MR&M: How do you approach a production?

SP: Sort of like a composer below the console. I've really gotten into all my devices, my tools, and learned to use them in such a way that I know how they work and why they work. You have to use all the tools you have to get an emotional point across. This has been an invaluable training ground.

MR&M: What is your musical background?

SP: My parents are both Juilliard graduates; I grew up in a real musical household. I learned my scales and chords from dad. They tried to get me to play all kinds of instruments but before fourth grade, I wasn't having any; I wanted to sing. My father owned a music store, so around fourth grade I settled on clarinet because I thought it would be the easiest. When I was about 12, this guy walked into the store who I'm sure was Bob Moog. In the back of his station wagon was one of his first synthesizers (I now own that very piece of equipment), serial number 002. It was like when the first cars started appearing in places where there'd only been horseless carriages before. It made a lot of noises but wasn't making many musical sounds, and that started me, because I knew there was a way to make it work.

MR&M: Did you have a science or physics background in school?

SP: I went to two colleges and started out in accountancy before I decided that being an accountant wasn't my life's destiny. Then I went into film and TV and I double-majored in that and physics. I guess that makes you a great director of science shows, I don't know (laughs).

MR&M: When did you start building your own studios?

SP: I had a 4-track recording studio in high school, the old Teac 3340S. Then I somehow convinced my grandmother that I needed an 80-A and she co-signed a loan. Even in college I was writing music and doing my own stuff.

MR&M: Do you compose on the synthesizer?

SP: No I don't, but a lot of people do. The Synclavier is tremendous for that—if you're the type of person who likes to overdub and overdub, 16 channels of synthesizer. It's like a recording studio in a box. I don't do that; I take a piece of score paper, sit down at the kitchen table, pour myself a glass of diet soda, and start writing. Everybody's different, and one thing that computers have taught me is that if you and I both approach the same problem, our solutions might be identical but our methodology of getting there will be very different. So there are strong arguments for owning the multi-track setup; I actually ended up working both ways. Certainly there's a definite argument for the technology getting less expensive—the 4-track cassette decks and so on. Now anybody with a grand can start playing music, and that's very important.

MR&M: I'm surprised to hear you say that, because I'd think that an

experienced composer and musician wouldn't want just anybody to be able to walk in off the street and make music.

SP: Why shouldn't they? Music is for people. See, if I give you a violin and I give Jascha Heifetz a violin, chances are that he's going to have a slight edge over you. If you give me a Synclavier and give someone else one, it'll do what I tell it to or what they tell it to. Hopefully my ideas will be more intelligent or sound than theirs. But if they're not it doesn't matter. It only matters when I'm competing in the jingle business.

MR&M: Is it a heavily competitive field?

SP: You know what? We don't creatively compete. We just don't. We can only compete by being on time, being within budget, or by being technologically flawless. If people like the way I compose they're going to say "I like that tune. Write me another one." And if they don't, I can't change a thing.

MR&M: You mean that it doesn't bother you at all if you're watching a spot on TV and you know that the music was done in 15 minutes on lousy equipment?

SP: No, I think it's fantastic. The music business, like any other, goes in cycles. You can look at the computer industry and see what their problems were and how they solved them, and you have to look at the music business the same way. When Apple came out with the Apple II, it took about 24 hours to read the manual and learn enough about BASIC programming to use the Apple computer. When the Apple II+ came out, there was pre-packaged software and higher-level programming available, so it was cut down to about eight hours, depending on your needs. Now, in the video game industry, it took about 20 seconds to learn a video game, whereas the guitar takes a lifetime. A computer took eight hours and a video game took 30 seconds, so everyone went out and bought video games. Since there was nothing musically happening at the time (Michael Jackson hadn't attacked us yet), it was the perfect time for a new medium of entertainment. So Apple thought that if they could get the time it took to learn a computer down to about a minute or two, they would sell everything they could make. Hence the MacIntosh, the video game of the computer industry. So now almost total illiterates can use this computer, a useful business tool, as a video game.

Equipment List

Synthesizers and Accessories

Synclavier II (with sample-to-disk)
Sequential Circuits Prophet 5
Sequential Circuits Prophet T8
Oberheim OB-8
Yamaha DX-7
Yamaha U3 (upright)
Fender Rhodes
Moog System II
Voyetra Eight
Arp 2600
Arp Sequencer
Lyricon Wind Driver (interface)
LinnDrum Computer
Digi-Atom 4800 Analog-to-MIDI interface
SRC SMPTE Reading Clock

Signal Processors

Lexicon 224X Digital Reverb
Eventide Harmonizer
DeltaLab Effectrons (10245)
Various compressors, limiters, and equalizers

Amps Crown

Monitors

Electro-Voice Sentry III
Electro-Voice Sentry 100A
Auratone
Radio Shack "very realistic" speakers

Mixing Console

Sound Workshop 1280B-8EQ

Tape Decks

Otari MX5050B (2 track)
Otari MX5050B (4 track)
Teac 80-8 with dbx (8 track)
Teac 25-2 (2 track)
Studer Revox PR99 (2 track)
Sony TC377 (½ track)

Video Equipment

(2) JVC 8250 ¾-inch video recorder
Panasonic VHS ½-inch video cassette recorder

Computer Equipment

Apple II+ with MIDI interface
IBM PC
BTX Softouch™
(SMPTE synchronizer)

Similarly, you take a Moog synthesizer and say that it looks awfully ominous, which it is. I've had it for 14 years, so I can basically make any sound I can think of on it between 30 seconds and five minutes. I can make the same sound on the Prophet T8 in about a tenth of the time. (The Moog is monophonic and the Prophet is polyphonic, so there are some differences.)

Now, let's take that a step farther and say that the timbre in and of itself is unimportant but the emotion that the sound stands for is. So it's not the particular timbre of the string sound, but the string-like sound that you want. You can get one of those Casio things out of the store, press a button, and you're playing music. It's the video game of the music business. I hope they make a gazillion of them. Everybody's walking around playing synthesizer music and that can only help the industry.

MR&M: But to get back to the last question, if someone who knows nothing about playing music can play it in 30 seconds, he can theoretically take a job away from you.

SP: The work part of this is a business, and that's where going to accounting school didn't hurt me. The reason we don't compete is because even though most people don't hear the subtle differences between what talented musicians and amateurs produce, a talented musician can make the sounds that a client demands, whereas the non-musician can't. A client may come to me and say, "I want this to sound like Lithuanian folk music sung the way Willie Nelson might sing it." Anybody that can take that kind of bullshit can be in this business. So it goes from having a minimal amount of musical aptitude to a maximal amount of business acumen, and then you have to synthesize a chart that still sounds like music. If you can do that, you've done something.

MR&M: How much creative freedom do you have with jingles? You have 30 seconds to make cat food

In 1983 we did 176 commercials, which averages to one every business day. The technology makes it possible. A lot of it is experience, a lot is craft, and a lot is knowing what the clients want.

sound attractive. How do you work with that?

SP: Each client has a different impression of me. There are some who think we make sound effects and others who don't know we do sound effects. Some think of me as a songwriter but not an arranger or composer; others will give me someone else's theme to arrange for a specific style. So you have a lot of creative freedom within some very strict parameters. You can look at those parameters as a limitation or as a challenge. I choose the latter because it makes me better at what I do.

MR&M: You do your work on elaborate, state-of-the-art equipment, but by the time your work comes out of Joe Public's beat-up old TV set, it can sound like garbage. How do you compensate for that technology gap?

SP: We generally mix on a speaker from Radio Shack. A lot of people in my business don't understand the limitations of a playback system and I can't understand how they don't, because we're all in the same business. Television speakers are generally between 300 and 3,000 Hz, and it's compressed to the point that the signal-to-noise ratio is somewhat less than 20 dB. So it's either on or off, not even loud or soft. But it's not unlike mixing for optical soundtracks on film, where the idea is to get everything as loud as you possibly can, all the time. Being in the studio as much as I am, I've learned very quickly what is a waste of my time and what isn't. If you're putting down basics, for example, and you know you've got

32 other musicians coming in, plus vocals, plus voice-over, and the piano player misses something, you'd go back and change it at a record date; but here the wisdom is to let it ride. You know that no one in the room but you heard it. How much difference does it make? Plus, there's a guy in the spot saying "Buy it, buy it, buy it!"

MR&M: Does that guy saying "Buy it!" interfere with your art?

SP: No. That is my art. But it's not necessarily an art; it's an artisan's craft. When you're doing a record or a film, people have paid their money to be entertained. When you do something on television to sell a product, it's exactly the opposite. They're on their way to get coffee, grab a sandwich. You have to say, "Yo! Wait a second! Come back here and buy this shit!" That's a whole different set of standards. I mean, this is a cinderblock through a plate glass window. Some commercials can work if they're soft, especially if they're in the midst of loud, boisterous spots. But generally they're passed over and you're on your way to get a beer. The idea is to be nailed by the whole thing; it's an event that happens for 30 seconds. If you hear my track or the announcer's voice as a separate entity, we've screwed up.

MR&M: How long does it take you to create a piece for a commercial?

SP: In 1983 we did 176 commercials, which averages to one every business day. The technology makes it possible. A lot of it is experience, a lot is craft, and a lot is knowing what the clients want.

MR&M: You've written a computer program you call the Master Click Program. In your advertising for it, it's described as the only "Composer friendly" computer program. Can you describe what it is?

SP: It allows me to take film counts and video counts and put a score together at an amazing rate. I used to spend maybe an hour doing film math for a 30-second spot. Now I

A client may come to me and say, "I want this to sound like Lithuanian folk music sung the way Willie Nelson might sing it."

spend about three minutes—as fast as I can type it in and tell the computer what I want it to do. It used to be that you got two spots and you knew you'd be doing five hours of mathematics before you got to write one note. We did a spot recently and the math took about three minutes. The writing took an hour and the production about two, so we had it done from start to finish in about half a day.

MR&M: What else did you use to help put that spot together so quickly?

SP: Master Click helped with the film math, and the Synclavier sequencer-editor package called Script also helped. Our own sequencer-editor package helped a lot; it's a little of everything.

MR&M: What is the theory behind the Master Click program? How does it function?

SP: In the real film business, an editor will move a frame or two to make the music work. Unfortunately, out of 450 to 500 commercials that I've done, I'd say that half of them were post-scores, and of those, three were able to be changed; everything else was cast in stone. It's started on film, finished on tape, now here's the video tape and have a good time. Which means that you don't have a choice; if it doesn't hit, it doesn't hit. In order to make it music, you've got to come up with a way to find a click, a groove if you will, that will hit whatever you want it to hit simultaneously on the video tape, on a downbeat or an upbeat, or wherever. So you have to find a beat that will nail all the visual cues and still sound like music.

To do that, we wrote a program for the Apple II+ and Apple IIe and the IBM PC called the Master Click program. What it basically does is allows you to input all the data about the hit points. You type in a location and a name for it; the computer labels it, tells you how long the cue is, tells you what frame or beat it's going to fall on in a given tempo. Then what you do is go into the tempo-finder module and say, "Look, computer, in my head I hear this at 125 to 130 beats-per-minute. Tell me what the best tempo is in that range." It works in film frames or beats-per-minute or click periods. So you can say, for example, that we can work between a nine frame and a 10 frame, which is between 160 and 144 beats-per-minute. It marks the file for you. You can give certain hit points higher values than others when editing your

file down. You can choose the widest possible range of tempos. If beats-per-minute aren't working you can use frames-per-beat, which are slightly different, or click periods, which are also different. The computer does all the math parts, which is great. What it doesn't do is to get a sense of the rhythm of the piece. A film has a certain rhythm; you can't really feel it; you could come up with a tempo for it, though. As a composer for film you start to feel what that film is about.

Some of the people who've bought copies of Master Click include Herbie Hancock and Maurice Gibb. Everybody said that we should market our MIDI software, but the Master Click program is 25 lines of code and 800 lines of error trapping, which makes it idiot-proof. It's a fairly simple program. Now, when you talk about our MIDI program, which is about 250 lines all by itself, the error trapping would be a massive job. Roland is marketing in a box a parallel-to-MIDI interface for \$175 retail. I can't compete with that. I'm not in that business. We're distributing the SRC (SMPTE Reading Clock) for the east coast and the Digi-Atom 4800 for the whole country, but basically, I'm a composer, and these are my tools. People wonder why I'm so nonchalant about my technology, but how many carpenters do you know that have a party when they buy a new hammer?

MR&M: Do you get a lot of criticism from people who don't like the idea of music becoming so dependent on computers?

SP: Some people say it's too slick—so it is. There's a definite energy to rock'n'roll music played by non-musicians; it's very raw and emotional. But there's a certain slickness to playing Bach at the right tempo, too, and that doesn't mean it's not good. I enjoy that kind of critique.

MR&M: You've said that the production values used in jingles are on a par with those exercised by talents like Quincy Jones and Steely Dan. How so?

SP: First of all, the players are monsters. They will not only read off the page what you wrote, but augment it with their creativity. My favorite engineer is a guy named Ben Wisch, who can stay on top of so many things at once, that if something is wrong I'll never know about it. We can do three spots in about five hours recording time, with 40 minutes each for rhythm section, strings, horns,

and an hour and a half for vocals, with 40 minutes for the mix. There's no such thing as fixing it in the mix in a jingle; it's just the opposite. These guys don't make mistakes, and if they do, second pass and it's fixed. So you have a lot of time to talk about the groove and the feel of the spot.

That's for an acoustic production. For a synthesizer production, you'd be amazed at the amount of broadcast work we do right out of this room. The analog 8-track facility we have here was originally conceived to be a place where I could take a musical idea and communicate it to somebody. Its ability to do that hasn't changed; I can still make a very presentable demo tape on eight tracks.

MR&M: What kind of board do you use in your studio?

SP: It's a Sound Workshop 1280; it's like a recording studio in a box. When we have to pull rabbits out of hats, this room is great at that. The Synclavier puts out 16 channels at a time; the Voyetra is two channels at a time, the Prophet T8 is two channels, the Arp 2600 is one channel at a time, and the Apple computer that powers all of them will put out 16 channels of information simultaneously. It's bizarre. You end up getting things that are orchestral in nature going down in one pass, reading sync; it's pretty funny.

MR&M: What percentage of your work is done outside your studio?

SP: About 60 percent. But every job that starts here has to finish outside eventually because we don't do video post-production here. Although we will have that soon.

MR&M: What is the first thing you discuss with a client who wants a spot?

SP: We sit down and I ask them what they are trying to accomplish with the spot. My approach is to find out what people will feel like when they're done listening. Period. How I go about getting that is my own business. I refuse to show off with the equipment. It's O.K. in the theatre, but I feel sorry for the synthesist who pulls that shit in the studio. The gear itself is not hallowed; there's no gear in this room I can't live without. If necessary I could get the same point across with a comb and tissue paper. It's the melody that's important.

MR&M: So, if you could take your equipment to the Carnegie Hall stage and play whatever you wanted, what would you play?

SP: Handel flute sonatas.

MODERN RECORDING & MUSIC

So You Wanna Be A Rock'n'Roll Star: Part VII

In our last installment, we laid out some of your options for gaining inexpensive access to video production facilities and got you started on your script. This month, to give you an overview of the production process, we'll take you through an actual MTV *concept video* shoot, then go behind the scenes at the taping of an HBO Concert Special for a look at *performance video* production techniques.

Before we go onto the set, however, let's briefly run down a little technical background.

Almost all of the videos currently on MTV are actually shot on 35mm film. 35mm is the format commonly used for theatrical movie releases; it gives you better optical resolution and a softer, less "electronic" look than shooting directly on video. The film footage is transferred to one- or two-inch videotape for editing and distribution.

The performances in the clips—including performance videos—are lip-synced to pre-recorded audio tracks. The "onstage" sequences you see in many of the clips are actually shot in rehearsal halls or on soundstages, carefully staged and lit to simulate live concert performances. The only truly "live" performances you'll see are in the concert specials, and these usually have 24-track remote-recorded audio tracks which are touched up, overdubbed, and re-recorded in post-production to correct rough spots.

Let's briefly run through a couple of actual productions so you can get a look at the basic process. We'll start with a typical label-produced concept video, Quarterflash's "Take Me To Heart." You'll remember we looked at the script for this project in our last installment. The band and the record company approved this script, and a production company was selected. The shoot required three days of pre-production, two days and a night of actual shooting, and another day for post-production.

Pre-Production

On the first day, the crew began building the interior sets while artists began drawing up complete storyboards from the script. (Storyboards look something like a comic strip, showing how each shot will appear on the screen, with the accompanying audio written out below each frame.) We videotaped casting auditions for the male lead and began scouting outdoor shooting locations with a Polaroid.

The second day, as set construction continued, we finished the casting and shot a still-photo session with our male actor (the script called for a wall covered with candid pictures of the male lead). Everyone pitched in and began a giant scavenger hunt to collect the necessary props.

By the evening of the third day all the props had been gathered into one corner of the soundstage, the storyboards were finished, the last coat of paint was drying on the sets, and our still photographs had been developed and printed. The construction crew went home to a well-deserved rest, and we began moving in the furniture and props necessary to create two realistically "lived-in" apartment sets. Some time after midnight, with the sets dressed down to the last carefully arranged cigarette butt, we were ready to set up lights and begin rolling film.

Lights! Camera! Action!

The cast and crew were on the set at eight the following morning. Rindy went directly into make-up, and director John Mincey began placing lights, taking exposure readings, and "smoking the set." The use of smoke is a common trick in film and video. Chemical foggers or beehive smokers are used to spread a smoky haze throughout the set; this subtly reflects and diffuses the light to create a soft, magical optical

'The sound is dry, rhythm is lifeless, and a thin vocal is swimming in muddy bass'.

It happens to everyone. Basic mixer controls are simply not enough to squeeze the best out of every performance.

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quality. Almost all the music videos and commercials you see on television use this technique, though the smoke is usually too diffuse to be clearly seen. In staged performance videos it's common to use a lot of smoke as an effect; you can see it billowing up around the performers and creating distinct shafts and brilliant "clouds" of light onstage.

Meanwhile, the sound crew set up a stereo Nagra, crystal-synced to the film camera. They would use this to roll a reference dub of the song through a PA system at one end of the soundstage; Rindy would lip-sync to this while the camera rolled. The reference dub includes a SMPTE time-code sync track from the master audio tape; this sync track is later transferred to the reel of video tape which will be used for the edited master. Thus the film camera, master audio track, and final video edit all "march to the same time-code" and remain in sync.

Shooting began at 10 o'clock and continued on through the afternoon. Each take of each shot was carefully slated and logged in reference to the shooting script. By the end of the first day of shooting we had most of Rindy's vocal sequences in the can.

The second day was devoted to finishing Rindy's vocals, getting a high crane shot of her sax solo, and finally shooting a sequence in the male lead's "apartment." We wrapped up the soundstage shooting with various necessary odds and ends (such as a close-up of a tone arm dropping onto a phonograph record just before Rindy's sax solo). These "specials" are usually saved for the end of the shooting session, since they don't require the full cast and crew to be present.

All the outdoor location sequences were shot the third night. This shoot required the after-hours use of a department store display window, the closure of two downtown city streets (re-routing a section of the municipal bus system), and the use of a city street-washing truck to wet the streets down. As you can imagine, a major portion of pre-production time was spent plowing through the inevitable mountain of red tape. We started shooting as soon as it got dark and finished the final crane shot just as the sun was rising the next morning.

Post-Production

The first step in post-production is to make a rough transfer of all the raw film footage to 3/4-inch video cassettes. For ease in editing, these are imprinted with visible time-code reference. (Each video frame has its time-code "address" printed on it; when you roll the tape, the result looks something like the digital-stopwatch timing superimposed over televised Olympic events.) These 3/4-inch tapes are used as a work print, allowing you to choose from the various takes of each shot and assemble a relatively inexpensive "rough draft" of the finished product.

The next step is to make a high-quality transfer of the selected takes from the original film negative to either one- or two-inch video tape. The result is a pair of unedited video reels (the "A-roll" and "B-roll"), containing, in alternating order, all the shots necessary to assemble the final edited product. Thus, shot number one is on the A-roll, shot number two on the B-roll, shot number three on the A-roll, and so

forth. The "A-roll, B-roll" system allows you to do dissolves, split-screens, keying, and a host of other special effects during editing.

Finally, a high-quality dub of the stereo audio track is laid down on a fresh reel of video tape, along with the SMPTE time-code from the original audio master. Each shot is carefully insert-edited from the A and B rolls to this reel to create the final, edited master tape. Dubs are made, rushed to the label, and it's—cross your fingers—MTV, here we come.

video

Performance Video Production

Although the concept video is currently the most popular format on MTV, most demo clips are *performance* videos. These are generally cheaper to produce, and they showcase the artist more clearly for the record company. Demos are usually shot directly in small-format video. Some are staged and lip-synced, but most demo shoots are really "live performance videotapings." This requires some different production techniques and a different approach on the part of the artist.

Let's go behind the scenes and see how a live performance videotaping differs from a staged lip-sync shoot. Once again, we'll use a Quarterflash project as an example—this time, their HBO concert special. This shoot required two days of pre-production and two nights of taping. The show is currently airing on the cable network.

Pre-production for a live performance shoot consists mainly of familiarizing the video production crew with the band's material and stage show. For this project, Quarterflash ran through their live material in a rehearsal hall while the director and assistant director noted cues, solos, lighting changes, and possible camera angles. Key stage moves were carefully blocked out and noted.

In a concept shoot only one camera is usually used; the various isolated shots are compiled into a finished product during editing, like a movie. In a live performance shoot, two or more cameras are commonly used. There are two basic techniques commonly used for multi-camera shoots.

The first method, most common to demo work, entails the use of a video switcher. The switcher allows you to switch between several different video sources, such as cameras, to get different shots. When you watch the evening news on TV, you're seeing this technique in action. The director switches from one camera to another, or switches from a camera to a videotaped news story, and the picture on your screen changes accordingly. The switcher output can be recorded on videotape, allowing you to feed a single tape machine from several video sources. However, only the video source you select on the switcher will be recorded. If you don't switch to a particular camera in time to catch something, the shot is lost. This method is fast and relatively cheap, but it limits your final

product to the shots you selected during the shoot—in effect, forcing you to "edit" your production real-time, on the spot. This can be extremely demanding, even with only two or three cameras to juggle.

Fortunately, the second method of multi-camera production allows much greater flexibility. Here, instead of routing all the cameras through the switcher to a single tape, each camera feeds its own tape machine. Having a separate video recorder for each camera allows every shot from every camera to be recorded and kept. The director can then assemble the finished product from this bank of stored shots during editing, just like we did in our single-camera concept shoot above. This technique is commonly used for large-scale, "one-shot" events such as video concerts.

The Quarterflash HBO shoot required six cameras. There were two large camera cranes down in the audience to either side of the stage for front-on shots, plus a third in the back of the hall for long shots. Onstage, there was a handheld camera for close-ups and a large crane behind the band for reverse shots toward the audience. Finally, a remote-controlled camera on a luma-crane swooped and rotated overhead, catching dramatic angles from directly over the drum kit or from high above the stage.

Early on the day of the taping, the various production crews moved into the actual performance hall—in this case, the Hollywood Palace—to begin setting up. With four different crews working feverishly together in the same space, the stage quickly became a war-zone of lighting trusses, camera dollies, anvil cases, and cables. By early evening the final lights were being aimed, and the band took the stage for a quick soundcheck—both for the house PA and for the 24-track remote recording truck outside. Finally, the cameraman changed into black clothing and adjusted the black velvet draping over their camera cranes (this makes them nearly invisible so they won't show up in each others' shots), and it was time to open the doors to the audience.

The first night's show was intended as a dress rehearsal. The band and cameramen got used to working the stage together, and the sound and light crews ran through their new cues. Out in the trucks, the director and assistant director worked through their camera moves and cues, and the audio engineers got their levels and EQ adjustments set. The next day we watched the rough tapes and noted improvements we could make for the second night. The final show turned out to be even tighter and more energized than the rehearsal, and the videotaping came off without a hitch.

By now it should be clear that video production is a complex mixture of interconnected disciplines—cinematography, lighting, audio production, set design, stagecraft, acting, and editing—each a full-blown specialty in its own right. Hopefully, we've touched on enough different aspects of the process so that you'll at least know what questions to ask when you begin your own project.

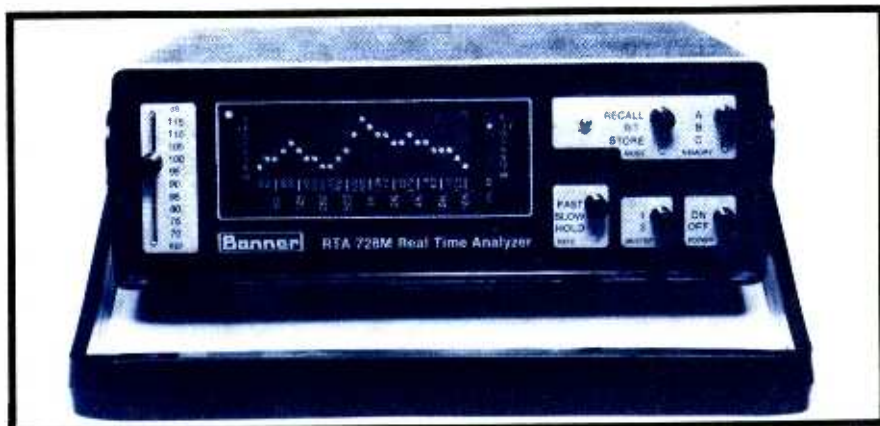
If there's any specific areas of video production you'd like to see explored in more depth, by all means let us know (write to us c/o *MR&M*). If there's enough interest, we'll delve into specific facets of production in future articles. Best of luck—see you on the silver screen.

The Market Place

what's new in sound and music

BANNER REAL TIME ANALYZERS

Banner's new generation of Audio Spectrum Real Time Analyzers consists of two new products: the RTA-728 and the RTA-728M. The new models feature battery or AC operation and can be hand held or placed on a benchtop with the handle serving as an adjustable tilt stand. Both models are 27-band 1/3-octave analyzers with frequencies set to standard ISO centers. A broadband sound pressure level display is also provided. The display consists of a matrix of 196 LEDs arranged in 28 columns of 7 LEDs each. Selection of 1 dB or 3 dB per display step is provided. Display decay rate can be set to Fast, Slow, or Hold. Balanced microphone inputs are on XLR connectors, and line inputs are on standard 1/4-inch phone connectors. Double-tuned filters are standard. The RTA-728M has all the features of the RTA-728 with the addition of



three non-volatile memories. At the push of a button, displays are stored in memory and can easily be recalled for later use. The suggested list price of the RTA-728 is \$395.00; the RTA-728M (with memory) is \$595.00.

Optional accessories include the AC adapter, the AM-4 Analyzer Microphone, and the Model 700 Noise Generator with balanced output.

Circle 38 on Reader Service Card

SOUNDCRAFTSMEN COMBI-DAPTER

Soundcraftsmen's new PC-X2 Combi-Dapter makes it possible to combine two PCR800s into an attractive, single front-panel assembly, creating a 600-watt-per-channel amplifier that cosmetically matches the company's preamps and tuner. Operating two PCR800s in a bridged mono mode provides 600 watts-per-channel into 8 ohms, yet is smaller, lighter, and less expensive than most stereo amplifiers rated at 1/3 the power. The PCR800 is an advanced power MOSFET design that produces maximum power output on a continuous basis; it is rated at 205 watts-per-channel into 8 ohms (FTC), 300 watts-per-channel into 4 ohms, and 275 watts-per-channel into 2 ohms. In the bridged mono mode, it



produces 600 watts into 8 ohms. It weighs 18 lbs. and retails for \$449.00. Combining two PCR800s with the PC-X2 creates a powerful stereo amplifier weighing less than 40 lbs.

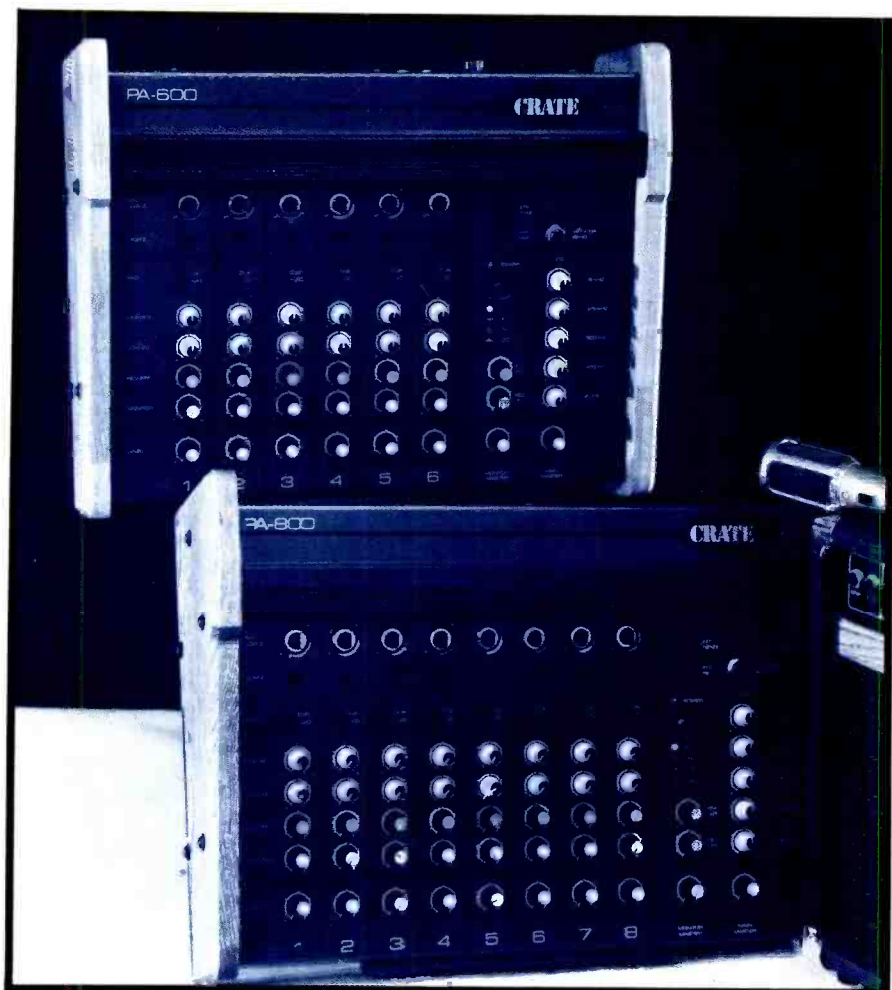
which retails for under \$950.00. The PC-X2 Combi-Dapter alone costs \$49.00 retail.

Circle 39 on Reader Service Card

NEW CRATE MIXERS

SLM Manufacturing's new Crate PA600 (6-channel) and PA800 (8-channel) powered mixers offer musicians a wide variety of professional features at affordable prices. Both the 6- and 8-channel models are packed with sophisticated features not normally found on mixers in this price range. Each has a 5-band master EQ, internal reverb, 5-stage LED relative output ladder, separate effects send and return, and independent monitor master control. The mixers, which develop 125 watts RMS across 4 ohms and 190 watts RMS across 2 ohms, have easy-to-read color-coded control knobs. Line inputs and outputs give them even more flexibility for live performances. Each channel provides the engineer with two-position input gain pad, balanced low-impedance inputs, active low and high shelving EQ, independent pre-monitor send, independent post-effect/reverb send, and individual gain control. The PA600 carries a suggested list price of \$559.95; the PA800 lists at \$629.00 suggested retail.

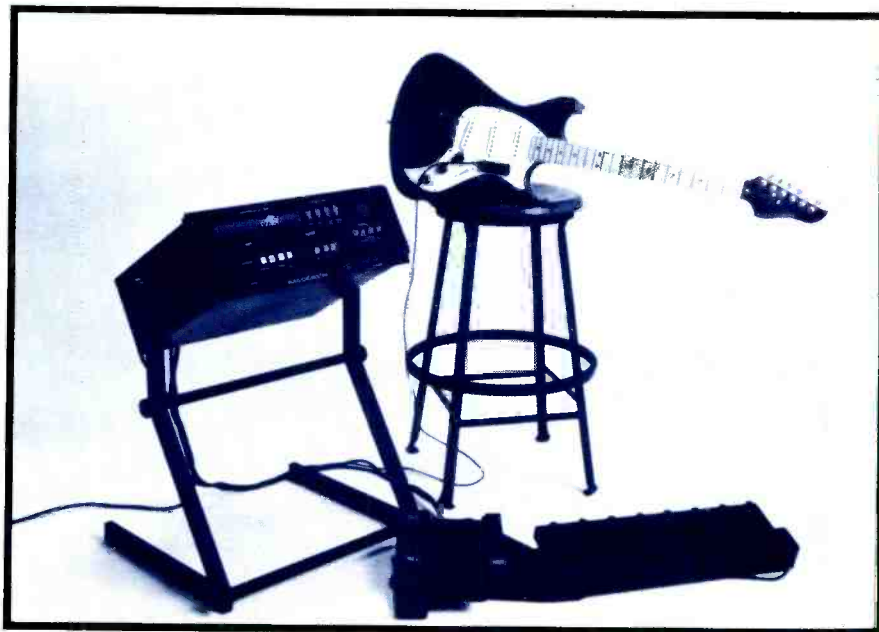
Circle 40 on Reader Service Card



MTI AUTO ORCHESTRA

Music Technology Inc.'s new Auto Orchestra Model 16R makes it possible for one person to "be his own band." The sounds that are produced by the 16R include drums, bass, piano, organ; with the proper devices it can also produce strings and brass. No preprogramming is necessary, because the Auto Orchestra is a real-time device. The controls are simple to operate and consist of one octave of chord switches, a chord-type select foot pedal and remote switch to add drum breaks, snare drum rolls, and cymbal crashes. 16 versatile rhythm patterns are included, but these may be expanded by 48 more patterns with the optional memory expander. These additional pattern styles are country, rock, top 40, commercial, and latino. You can add the rhythms that fit your style of playing. The package also includes a unique tilt-top rack stand.

Circle 41 on Reader Service Card



ADA DIGITAL MULTI-EFFECTS

ADA's new 2FX Digital Multi-Effects unit is a professional digital delay processor that can produce two effects at once. The 2FX has a separate group of controls for each effect: Flanger, Chorus, and Digital Delay. The Flanger or Chorus can be used simultaneously with the Delay or Repeat Hold function. The exclusive Patch Switching System adds the flexibility of selecting the positions of the effects in the signal processing chain. The optional DM-2 Footswitch Controller provides remote access to Bypass and Effect selection. The DM-2's Memory Bypass™ function remembers any combination of preset effects. A single tap of the Memory Bypass™ footswitch gives instant access to the last



combination of effects used or effects pre-set while in the bypass mode. LEDs on the DM-2 footswitch indicate the status of effects in use or ready for use. Other features include over one second of delay at 17 kHz

bandwidth, 10-to-1 sweep range (Flanger), and a one year parts and labor warranty. The suggested list price of the 2FX is \$599.95, the DM-2 Footswitch, \$99.00.

Circle 42 on Reader Service Card

MITEC MONITOR MIXER

Mitec's new monitor mixer, distributed by Audiotec, is a 16/8 mixer with 4-band active equalization. It provides eight monitor cues for each channel to satisfy the individual tastes and demands of the musician on stage. The 16/8 monitor mixer retails for \$2,800.00.

Circle 43 on Reader Service Card



Hohner Electronic Accordion

Hohner's new VOX 4P electronic accordion utilizes the latest in digital technology and is in the vanguard of electronically sophisticated accordion design. It has a 32-voice synthesizer under the control of a microprocessor, offering musicians a variety of sounds and rhythms, facilitating the sound of a multi-instrument ensemble. The VOX 4P is housed in Hohner's four-reed Atlantic Deluxe IV accordion. Its treble side has seven organ flute voices, preprogrammed in eight registrations. These include five organ sounds (church, bright, mellow, and two jazz), tutti, trumpet chorus, and chimes. Cello and violin string are additional treble-side voices. Two special treble-side registers offer monophonic and polyphonic sounds. Register I, featuring polyphonic sounds, simulates piano, harpsichord, honky-tonk piano, and vibraphone—all of which can be transferred to the left side of the instrument. Register II, offering both monophonic and polyphonic sounds, has trumpet, trombone,



saxophone, clarinet, pan-flute, cello, violin, and wah and Hawaiian guitar. On the instrument's bass side, fundamental and counterbass rows include 16- and 8-foot flute voices, tuba, and bass guitar. Chord rows include 8-,

4-, 2-, and 1-foot flute voices with memory capability, piano on chord, Register I, and two string voices with memory capability. The VOX-4P's electronics are entirely housed in a readily transportable control unit. The arranger inside the control unit matches the appropriate accompaniment to the chosen rhythm. 16 rhythm patterns are available, ranging from rock to country to cha-cha, as well as four groups of instruments including digitally controlled drums, bass, and two additional groups that contain piano, guitar, brass, and other instruments designed to match selected rhythms. The accordion's sophisticated control unit has both automatic and manual tempo controls, a three digit LED beat indicator, as well as controls for ensemble, vibrato, and sustain. Six separate outputs—general, Leslie, percussion, mono, chords, and bass—enable the musician to arrange the sound with precision.

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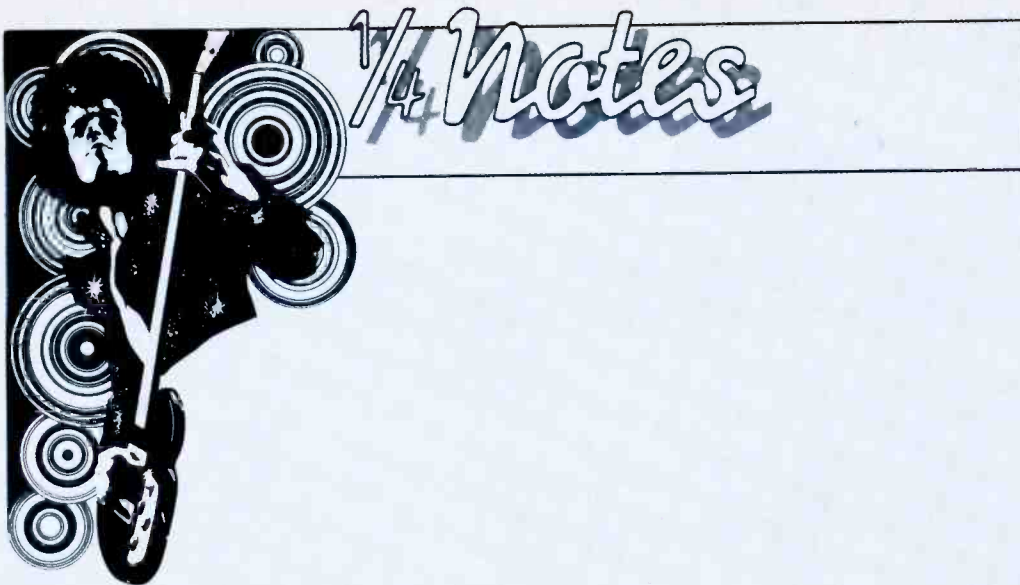
GAINES AUDIO ACTIVE DIRECT BOX

Gaines Audio's new AD-1 Active Direct Box is a high quality, low cost unit available either in kit form or fully assembled and tested. The AD-1 may be used with any electric guitar, bass, synthesizer or other electronic instrument, and provides an ideal way to get that instrument's output into the mixing console for recording or sound reinforcement. It features very high input impedance that will not load down or otherwise affect the sound of any instrument. The output is an active balanced (transformerless) type at mic level and will drive long cable or snake lines without signal loss. The circuit features low noise and distortion, flat frequency response, long battery life, and immunity to RF noise and magnetic fields. It is protected against input overloads and output short circuits, and is compatible with any audio system, including 48-volt phantom powered mic lines. A ground-lift switch allows you to float Pin 1 of the

output XLR connector, eliminating ground loops. A Level Select switch allows the unit to accept a wide range of inputs, from instrument level to line level to speaker level. Power is automatically applied when a ¼-inch phone plug is inserted into the output jack. The AD-1 is housed in a rugged cast aluminum enclosure, painted with a durable black textured enamel. Its graphics are clear and legible, even in dim lighting situations. The compact circuit board leaves enough room inside to carry a spare battery. Assembly of the direct box kit is facilitated by a clean circuit board layout, a minimum of hand wiring, and a clearly written instruction manual. According to the manufacturer, anyone who knows how to solder should be able to build the unit without trouble. The AD-1 kit costs \$39.95 plus \$2.00 shipping; the assembled and tested unit costs \$54.95 plus \$2.00 shipping.

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MAKING TRACKS

Island recording artists **U2** have begun recording their new LP with **Brian Eno** producing. The album will be recorded at the Shane Castle's Ballroom in Dublin, with Effanel Mobile Recording Systems. The LP is slated for a late summer release with a world tour to follow... **Columbia** recording artist **Bruce Springsteen** has completed his seventh album, *Born In The U.S.A.*, scheduled for a June release. The album was produced by Springsteen, Jon Landau, Chuck Plotkin, and **Steve Van Zandt**. It was recorded by Toby Scott at the Power Station, and mixed by **Bob Clearmountain**... **Roger Waters**, founding member of **Pink Floyd**, has released his first solo album, *The Pros and Cons of Hitch Hiking*, for Columbia Records. **Eric Clapton** and **David Sanborn** join Waters on this album... At Hyde Street Studios **Translator** has recently completed a five song pre-production demo for their next **415/CBS** project. Garry Creiman engineered with Ricky Lee Lynd and Les Stuck assisting. The band members, Dave Scheff, Bob Darlington, Larry Dekker, and Steve Barton produced... Also at Hyde Street, John Cuniberti and Chris Solberg of Spontaneous productions, have been working on a number of upcoming projects. They have been recording with **Doug Clifford**, formerly of **Credence Clearwater**, as well as members from **Mojo** and the **Greg Kihn Band**... At the Automatt: **Herbie Hancock** has been mixing an upcoming project for CBS with Ken Kessie and Maureen Droney engineering. **Romeo Void** is in cutting vocals for 415/CBS release with David Kahne producing and Joe Cakcarelli engineering. Francois Kervorkian will be mixing dance versions with Paul Mandl engineering... Country star **John Anderson** was recently at Sound Emporium to record several Chevrolet commercials. Producing the sessions was Larry Roode of the Cambell Ewall agency, with Lou Bradley engineering... Other recent Sound Emporium activity included the completion of two MCA country albums. **Don Williams** finished his LP with himself as producer; Garth Fundis and Gary Laney engineering. Also, **Gene Watson** finished his album with Russ Reeder and **Jim Williamson** engineering and Cathy Potts assisting... At Disc Mastering Inc. **Vern Gosdin's** new LP and single has been mastered by **Randy Kling**. The LP was produced by Blake Mevis for Compleat Records... **Jamaaladeen Tacuma** was in New York working on the upcoming **Cosmetic** album. Tacuma will also be featured on the new **Jeff Beck** LP for **Epic Records**. **Nile Rodgers** is producing... **Michael Sembello** and Dick Rudolph were recently utilizing **EFX Systems** to record tracks for the group **New Edition**. Thom Wilson engineered, assisted by Richard Brenner... Classic Sound Productions, a six-month-old 24-track recording studio, has already completed 20 jazz LPs. Among those recorded at Classic Sound were: **John Abercrombie/John Scofield** for **Palo Alto**, and **Archie Shepp** and **Clifford Jordan/Barry Harris** for **Soul Note**... Recently at Digital Sound Recording a remote digital recording of music by the Los Angeles Chamber Orchestra was completed. Carol Rosenberger produced, with **John Eargle** engineering... Polydor artist Pat Travers has completed the mixing of a live soundtrack for D.I.R.

Broadcasting at Bee Jay recording studios. Dana Cornock engineered... **Modern English** was also at Bee Jay recording a new LP for **Sire/Warner Bros.** Bill Vermillion was at board... At Trod Nossel, Nick Apollo Forte, star in Woody Allen's "Broadway Danny Rose," returned to record a new song. Nick hopes to use the new song in another motion picture or a TV series... **Rebecca deMornay** and **Loudon Wainwright III** have been at Web IV Studio recording vocals for Columbia Pictures soundtrack of "The Slugger's Wife." The soundtrack is a **Quincy Jones/Tom Bahler** production... **David Bowie** is presently writing his second album for EMI America, with plans to record in June for a September release... **Paul McCartney** will be releasing the soundtrack to his first post-Beatle feature film, "Give My Regards To Broad Street," towards the latter part of the summer. The film will premiere in early fall... After completion of their North American tour, **the Clash** will begin recording a new album this summer in Paris...

ON THE ROAD

Elton John will be playing a series of major venues throughout North America this summer. Coinciding with his tour will be the release of Elton's new album, *Restless*... **Rod Stewart** is planning a tour of the United States this summer. Joining the tour will be guitarist **Jeff Beck**... **The Beach Boys** are planning an endless summer of hits to be performed from coast to coast beginning in May... **Christine McVie** has embarked on her first solo concert tour. McVie and her band will tour in to the summer, supporting the release of her solo album... Roger Waters will do 10 live shows in England and Europe. Eric Clapton will join Waters on his tour. There is one U.S. performance scheduled at the Byrne Meadowlands Arena in mid-July... **Culture Club's** three week tour will be continued again this fall when they embark on a major North American tour... **38 Special** will complete the last segment of their three week world tour. It will run through August and include dates in Europe and Japan... **Bobby Womack** will begin a nationwide series of engagements that will feature appearances by **Sly Stone**... The St. Mark's Poetry Project will hold its second annual Rock & Roll Music and Poetry Benefit, July 13th at the Ritz in NY. The benefit will feature **Jim Carroll, Lenny Kaye**, and many surprise guests... On the video scene: **Westwood One's** Concertmaster II mobile recording studio caught **John Cougar Mellencamp's** recent concert in Bloomington, Indiana... As the spring quarter gets underway, Columbia Records is preparing to release videos by **Psychedelic Furs, Paul Young, Billy Joel, Bob Dylan, Roger Waters** and **Weather Report**...

MISCELLANY

The Musicians National Hot Line Association offers a wide variety of services for musicians who want to start a professional career in music. The Association maintains a telephone hot line and a computer search file to help musicians find bands to join. For more information write to: Box 7733, Salt Lake City, Utah 84107 or phone 1-801-268-2000... Steel guitarists **Weldon Myrick, Terry Crisp** and **Hal Rugg** will be teaching at the newly established **Nashville College of Steel Guitar**. The college offers three levels of five and a half day courses. The three artists have prepared a common text and instructional program. For more information contact: Nashville College of Steel Guitar, PO Box 679, 157A Lebanon Road, Mt. Juliet, TN 37122, or phone 615-754-0449...



POPULAR

ROGER DALTREY: *Parting Should Be Painless*. [Produced by Mike Thorne; engineered by Harvey Goldberg, John Brand, Lincoln Y. Clapp and Don Wershba; unknown recording site.] Atlantic 7 80128-1.

Performance: **Very professional**
Recording: **No risks taken here**

Roger Daltrey has always taken a conservative stance in his solo projects. That has not changed with *Parting Should Be Painless*. For his fifth solo outing—after *Daltrey, Ride A Rock Horse*, *One Of The Boys* and the film soundtrack to *McVicar*—the former lead singer of the Who employs his powerful voice to tackle all sorts of musical styles from ballads to blues-tinged numbers to straightforward rockers. Daltrey did not write a single lyric for this record, however, preferring to borrow songs from relatively unknown writers as well as such famous artists as Eurythmics and Bryan Ferry.

Daltrey has also brought in a very ambitious producer, Mike Thorne, who has previously been at the helm for records by Soft Cell, Nina Hagen and Urban Verbs, all of which are synthesizer-based and very different than Daltrey. Thorne also plays the synthesizer here, and often uses strings and horns to embellish the sound.

Daltrey works well with Thorne, exploring new areas and allowing the players to strut their stuff. While Daltrey does nothing to restrain the musicians, his own talent is so overpowering that he still manages

to overshadow them. The rhythm section of bassist Norman Watt Roy, Alan Schwartzberg on drums, and Chris Spedding on guitar provide simple, solid lines that help to add spice to the numbers. Former Ian Dury keyboardist Mickey Gallagher adds synths.



"Is There Anybody Out There" features a swelling string section that, along with Spedding's guitar swoons throughout the song, dotting it with catchy licks. Gallagher adds the same element with his keyboards, indicating that Daltrey and his producer knew when strings should be used and synthesizers should not. On "Would A Stranger Do," Dave Tofani opens with a mellow clarinet introduction and later plays an easy-going solo that is bold and original.

Yet on "Looking For You," where Daltrey lets loose his trademark rock-

ing holler, the brass instruments and synthesizers work well together, with each holding the spotlight for a moment. The discipline that Daltrey has learned in his many years in rock'n'roll is apparent here.

One of the most beautiful ballads on the record is "How Does The Cold Wind Cry," with its uplifting acoustic guitar and electric guitar-led melody. But the most awe-inspiring instrument on the song is Daltrey's voice, which ranges from soothing and gentle to daring and striking. But perhaps the most innovative song on the record is "Don't Wait On The Stairs," which has a monstrous horn section that gives the song a wallop. His voice is rough here and when the horns soar to a trill, the combination is spine-tingling. The bass line is haunting and menacing, as is the percussion, and the synthesizers whirl in and out and dance around the percussion. It is a fitting climax to an album that showcases the splendor of Daltrey's voice.

martin basch

NONA HENDRYX: *The Art of Defense*. [Produced by Material (Bill Laswell and Michael Beinhorn) and Nona Hendryx; engineered by Robert Musso; recorded at Electric Lady Studios, New York; mixed at RPM Studios, New York; mastered at Masterdisk, New York; mastering engineer Howie Weinberg.] RCA AFL-1-4999.

Performance: **Focused**
Recording: **Proficient**

Nona Hendryx is tough. Not raunch tough, like Tina Turner, not bitch tough, like Pat Benatar, not camp tough, like Bette Midler. Just plain tough. When she sings funk, she thumps with the bass. When she sings rock, she screams with the guitar. And even when she sings a ballad, she pierces the heart of the melody so that her voice is inseparable from it. But *The Art of Defense* contains little of the diversity of last year's Nona, so even a voice and songs as committed as Hendryx's become lost in uniformity.

The album emphasizes percussion, as drums—real and electronic—maintain the lead position on every cut. For a while they mesh with Hendryx's sharp vocal style, especially on "I Sweat (Going Through The Motions)." The rhythms are mixed way up, giving the song a dance pulse, and during the verses Hendryx's voice mirrors those rhythms. Then during the chorus, her voice ascends with the chord changes to a bellowing, near comic call-and-response.

But after two or three cuts the sound becomes too repetitious, even as the tempos change. In addition, Hendryx relies on the rhythmic power of her voice to the point that it becomes static, as on "Electricity," which sounds like something Richard Perry would concoct for the Pointer Sisters. Hendryx's lyrics also have a sameness—ambiguous relationships and sexual lifestyles. They are revelatory during the first, or second song but mundane by the last.

The only variation comes in the way the drums are recorded, as the delay time and ambience change from full rim-shot crips to open snare reverb. It's often difficult to distinguish between the real drums and the electronic, as each is captured with depth. But it's merely a change within the style, and Hendryx, clearly a singer and songwriter who crosses and breeds styles so well, seems wasted.

Hendryx and Material also produced *Nona*, and it's admirable that they have opted for a different album. As it's far too easy for an artist to follow a critically acclaimed album with a carbon copy. Unfortunately, though, they've gone too far, limiting the talents of a most versatile artist.

rob hoerbarger

The Jazz Perennials: Gene Roland and Red Norvo nat hentoff

Gene Roland should be recognized as one of the most distinctive and surely one of the most swinging arrangers in jazz history. The many musicians who have played his scores know that, but somehow Roland has never received anywhere near the public recognition he has long merited. Originally from Dallas, Gene has written for Stan Kenton (being one of the few writers to make one of Kenton's heavy-metal bands actually *move*). Roland also arranged for Lionel Hampton, Lucky Millinder, Count Basie, Claude Thornhill, Artie Shaw, Charlie Barnet, and his own band. With Woody Herman, Gene created the "Four Brothers" sound.

One of the year's delights is *Dick Meldonian-Sonny Igoe And Their Big Swing Jazz Band Plays Gene Roland Music* (Progressive). With Meldonian on alto and soprano and Sonny Igoe on drums, we have a whole set of Roland originals and arrangements played with fiery ease by a crisp, driving band. As musicians used to tell me, Roland's lean, lithe scores *make* a band swing. The lift, the momentum, the pulse are integral to the way he builds and intersects his lines.

The recorded sound accents the enthusiastic power of the band. It's like having a musical engineer bearing down on you. I would have preferred a bit more warmth spread about the sections, but I do indeed dig the excitement.

You could not tell from the youthful lyricism and elan of the music in *Just Friends/Red Norvo with the Bucky Pizzarelli Trio* (Stash) that Norvo made his first recordings as a leader more than 50 years ago. But then, Norvo has always been ahead of his time and his age. A persistently innovative—technically and conceptually—

vibist through the jazz decades, Red still plays each tune as if he had heard no other version.

The setting here is especially stimulating for Norvo: an exceptionally resilient, attentive, warm and full rhythm section. In addition to guitarist Pizzarelli, Russ Kasoff is on piano and Jerry Bruno is the bassist. The tunes are the kind that invite continual regeneration and reshaping, among them "Just Friends," "Jitterbug Waltz," and "I Thought About You." Red has the ability not only to find new, freshly convincing dimensions in everything he plays, but he also has his own genre of lyricism—a sometimes floating, sometimes dancing, impressionistic way of shading a mood.

The engineering is also just right for Red: two channels. And he himself explains why: "When they've got dozens of channels going, with five mics on the piano, five on the drums, and three or four on the amplified vibes, it doesn't seem quite right."

No, it doesn't, because the music has become subordinated to the engineer. That may make sense in certain kinds of music, but not in a form as personal and spontaneous as jazz.

DICK MELDONIAN-SONNY IGOE BIG SWING BAND: *Plays Gene Roland Music*. [Gus Statiras, producer; Fred Miller and Harry Munz, engineers.] PROGRESSIVE PRO 7062, P.O. Box 500, Tifton, Georgia 31793.

RED NORVO-BUCKY PIZZARELLI: *Just Friends*. [Bernard Brightman, producer; Charles Leighton, engineer.] STASH RECORDS ST 230, P.O. Box 390, Brooklyn, N.Y. 11215.

STEVE ARRINGTON'S HALL OF FAME: *Positive Power*. [Produced by Steve Arrington and Jimmy Douglass; engineered by Stephen Benben; recorded at Atlantic Studios, New York, New York.] Atlantic 7 80127-1.

Performance: **Funky, but not chic**
Recording: **Quite nice**

Steve Arrington gives new meaning to the word "positive" by inundating his second record with upbeat, funky songs that advocate feeling good about oneself and maintaining hope. While the music is provocative, the production is mildly reserved, even conservative. Certain lyrical raps are a bit muddled, but this flaw is so minute, that it does virtually nothing to mar this fine recording.

No newcomer to funk, Arrington uses an aggressive bass guitar that is rough and perky. And he is obviously a Hendrix fan, allowing a saucy, electrified, hard-edged guitar to complement his pieces, giving them a soulful flair. The harmonies are cool and tight, and give songs like "Money On It" a glistening quality as Arrington scat-sings *a la* George Benson.

The Dayton, Ohio, native played in various groups in California before receiving notoriety with the r&b group Slave. He first appeared on *The Concept* in 1978 and remained with the band through three more records: *Just A Touch Of Love*, *Stone Jam* and *Show Time*. He developed his versatile vocal skills and eventually emerged as the group's co-lead singer before leaving to pursue a solo career.

The result is music of a bright nature. Arrington's r&b ballads never ring with puppy-love corniness; instead they are polished and meaningful, as on "Sugar Momma Baby." "Young And Ready" is a refined, street-style rap song, but it avoids the pitfalls of sounding scratchy or dirty, problems that often occur with songs not recorded at state-of-the-art facilities. The secondary voice on the song moves from the right channel to the left channel as Arrington takes his turn scat-singing once again. The background vocals then mix with synthesizers so that one has trouble distinguishing between the vocals, the synthesizers and a voice-box, giving the song more lift.

"Positive Power," the title cut, sounds a bit weak and drained compared to the rest of the production. Arrington's vocals don't mesh with the instruments; they are



sometimes overbearing, other times too soft, as if no middle ground could be found. The song's throbbing bass line is redundant and seems to go round in circles, becoming repetitive and boring.

The percussion, bass and hand-claps are all in sync on "15 Rounds," where the combination makes for an irresistible dance number. Arrington stretches to the full range of his voice as a metallic-sounding synthesizer riff darts in and out. Arrington's infatuation with the guitar style of the late Hendrix becomes apparent again with a twisting, turning, scorching, too-short solo which fills up a few bars.

Steve Arrington's Hall of Fame, comprised of eight players, encompasses a vast array of musical styles from funk to rock to jazz, pop and salsa. The mixture is balanced, with no one style stepping on the other, although the funk does stand out. Three former members of Slave are now members of his Hall of Fame, and the entire ensemble has molded an album that echoes the inherently positive nature of the human soul.

martin basch

THE RESIDENTS: *American Composer Series—Volume 1: George And James*. [Produced by the Residents; engineer not listed; recording site not listed.] Ralph RZ-8402.

Performance: **Not of this world**
Recording: **Light years ahead of most**

The Residents are one of those love-'em-or-hate-'em bands, if they are a band at all. For over 10 years, this San Francisco based quartet has made experimental music with a flair for the mega-bizarre without ever revealing their identity. (On the few occasions they've played "live," the Residents have disguised themselves in bandages or eyeball heads.) Get the picture? No way—unless you've also heard them, because no one but no one makes music like the Residents.

For this project, approximately their fifteenth album, give or take a few, the Residents interpret the music of two great American composers, George Gershwin and James Brown. If that combo sounds a bit strange, well, it would be had anyone but these conceptual geniuses tackled the project. Using their usual mixture of electronic instruments and homemade contraptions, the Residents bridge the gap between these two seemingly disparate elements of American music by restructuring these well-known compositions from the inside out.

The Gershwin side features the classics "Rhapsody In Blue," "I Got Rhythm" and "Summertime" translated into avant-garde electronic symphonies. To achieve their goals, the group melds synthesized percussion and string effects with the traditional melodies to create a warped but nonetheless pleasant new look at Gershwin's tunes.

Still, no easy listening station will be rushing to air this work, given the ECM-on-acid tones produced by the band. From a sonic standpoint, however, there can be no argument: The Residents know their way around the studio, and the clarity of sound allows one to pick out the subtleties of



MODERN RECORDING & MUSIC

the production and playing. The Residents understand depth and texture; every note is carefully crafted and presented, and a listening through headphones will give one's ears a treat while forcing the listener to try to figure out just what these guys were doing to create the other-worldly sounds they did.

Flipping it over to the James Brown side will provide a large dose of culture shock. Amidst the synthesized, somewhat parodic reworking of the Brown soul tunes is a slowed-down-to-16 vocalist whose every breath sounds as if it might be his last. The group takes on much of the classic J.B. live at the Apollo material here, using both electronics and natural sounds, and snatches of audience applause where Brown's crack band and the crazed r&b legend himself once reigned. Humor is, of course, in large supply as well, but anyone who gets the impression that this post-modern example of studio wizardry is a putdown is simply missing the point. The Residents have always avoided convention in their music, and their mastery of recording techniques manages to turn their futuristic concepts into remarkable pieces of vinyl. Not everyone can claim that.

jeff tamarkin



KENNY WHEELER: *Double, Double You*. [Produced by Manfred Eicher; engineered by Jan Erik Kongshaug; recorded May 1983 at Power Station, New York.] ECM 1262/Warner Bros. 25000-1 E.

Performance: **Mostly strong**
Recording: **Fine**

Trumpeter Kenny Wheeler's most notable associations have been as a sideman with Anthony Braxton, as a member of the Globe Unity Orchestra, and as one third of Azimuth—with pianist John Taylor and vocalist Norma Winstone. His own albums and those to which he has contributed show Wheeler to be a markedly versatile musician; he has played with saxophonists Braxton and George Adams, trumpeter Leo Smith,

pianist Keith Jarrett, guitarists Ralph Towner and John Abercrombie—a varied lot of styles and schools.

Double, Double You, Wheeler's fourth record as a leader for ECM, is an expansive set of music, challenging to listen to, and satisfying to finally come to terms with. While the compositions on all four albums are Wheeler's, the personnel and settings have changed completely on each, as have the temperaments. On this album, the moods are functions of two long-standing partnerships which Wheeler has brought to the music: the first with John Taylor, the second with the team of bassist David Holland and drummer Jack DeJohnette, who were at the foundations of the earlier albums *Gnu High* and *Deer Wan*. Completing the front line is tenor saxophonist Michael Brecker, better known for precision studio work with the likes of Steely Dan, but of late gracing more fiery contexts with Chick Corea, Pat Metheny, Steps, and now, Wheeler.

In the end, history digested, the album is a strong one. Wheeler's leads and solos are interesting throughout, and the recording of these is admirably crisp and trouble-free. Brecker, consistently providing a pleasing warmth to Wheeler's cooler style and sound, is afforded numerous instances to stretch, setting fire after fire with each outing. Taylor, for the most part, comps and solos in sympathy with Holland and DeJohnette, unleashing a particularly strong stretch on the title track, "W.W." The band as a unit gels nicely, handling the alternating moods and tempos of Wheeler's arrangements with authority. The settings here range from a somber, introspective Wheeler/Taylor duet to a powerful, straight ahead jazz whirlwind for all.

While Wheeler's first involvements with ECM placed his style squarely in the middle of a critical debate regarding the label's identifiable sound, his own recent growth has paralleled that of ECM in one important way: very little is predictable anymore. The music is fresh, there are intriguing developments in recent jazz which have been drawn upon, and the choice of personnel is no longer limited to ECM stablemates. What we can expect, and *Double, Double You* is no disappointment in this regard, are well-recorded, well-pressed albums. It's the very least of what music like this, and players such as these, deserve.

—michael fishman

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