

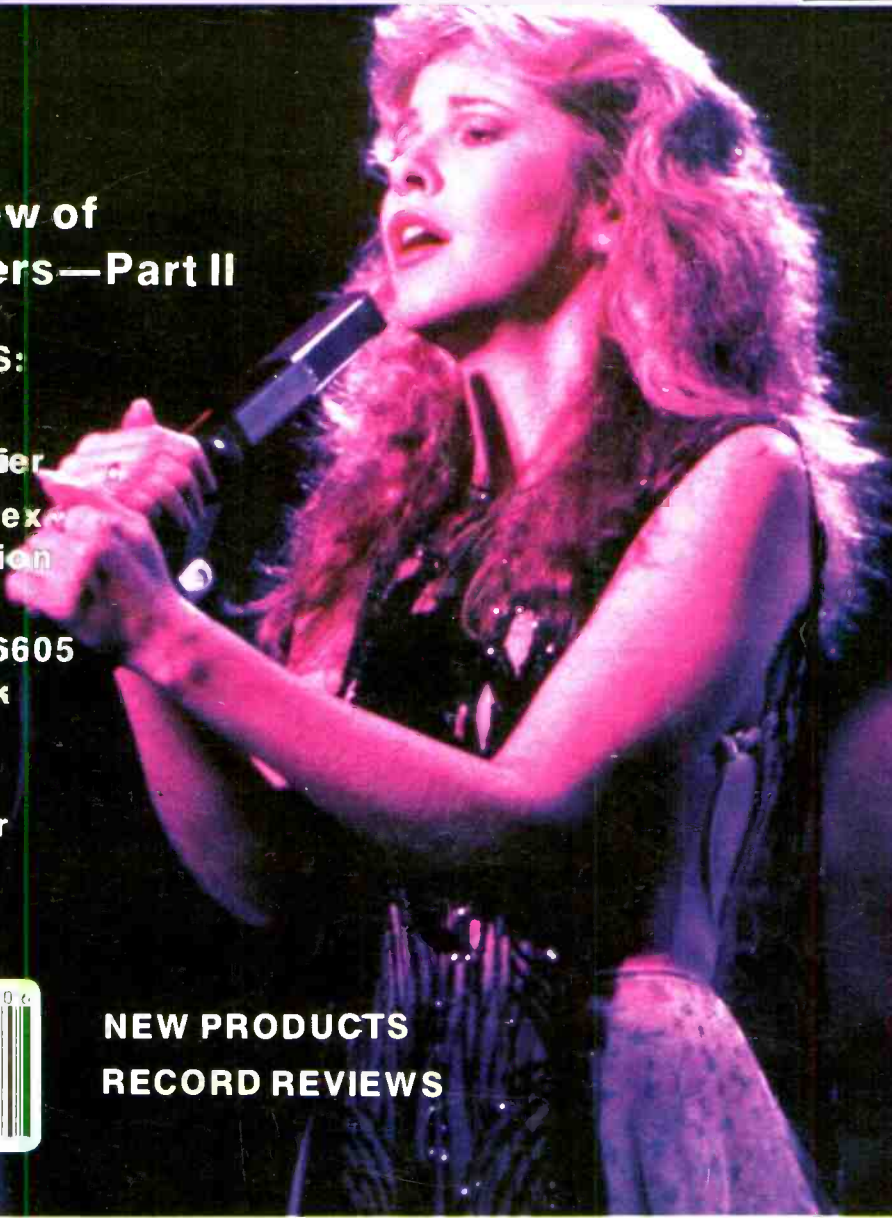
**Profile:  
THE TUBES**

# MODERN RECORDING & MUSIC

ICD 08560  
\$1.95

VOL.7 NO.9  
JUNE 1982

recording with  
**Stevie Nicks**



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Interview of  
Musicians—Part II

REPORTS:

A 125

Amplifier

Dynafex

Reduction

ca RT-6605

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NOTES:

Tuning Guitar  
Pickups



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RECORD REVIEWS

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**Roland**

*Understanding  
Technology  
Series*

*Subject:  
The Concept  
of Programmable  
Performance*

**ProForm  
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The new Roland ProForm Series is a group of inter-related products, each providing a specific musical function. Like individual members of a band, each of the ProForm products can sync with others in the series to produce a totally programmable musical performance. The first of the products in the ProForm Series are the TR-606 Drumatix and the TB-303 BassLine.



### TR-606 Drumatix

The Drumatix is a totally programmable drum synthesizer sequencer. The Drum sounds available on the TR-606 include: Bass, Snare, Lo and Hi Toms, Cymbal, Open and Closed Hi Hat. Each sound has its own level control for total mix flexibility.

With the Drumatix, you can program 32 different Rhythm Patterns which can be arranged to play up to 8 complete Rhythm Tracks (songs). After the TR-606 has been programmed, the TR-606 can easily sync with other ProForm products to play the complete drum track of the composition.

### TB-303 BassLine

As the Drumatix is to the drums, the TB-303 is to the Bass, a fully programmable bass synthesizer sequencer. The remarkable stable synthesizer section features full voice flexibility with dual waveforms and controls for: Tuning, VCF Cutoff, Resonance, Envelope Modulation and Decay. The programmable Accent and Slide functions bring true bass technique capabilities to the TB-303.

With the facility to produce up to 64 different Bass Patterns, the TB-303 BassLine allows you to arrange these into 7 different Bass Tracks, which can then be synced with Drum Tracks you've programmed into the Drumatix. The BassLine also can be easily synced with many other products by the DIN Sync jack or the CV and Gate outputs.

The ProForm Series is bound to appeal to any creative person for writing music, practicing, or simply communicating ideas to other musicians. Each of the products (and there

are more to come), is battery operated with AC adapter capability, totally portable, furnished with a carrying case, and also contains a built-in headphone amplifier which lets you plug in a set of phones and write and practice music anywhere.

**Roland**

We Want You to  
Understand the Future

CIRCLE 71 ON READER SERVICE CARD

# MODERN RECORDING & MUSIC

JUNE 1982  
VOL. 7 NO. 9

## THE FEATURES

### AN OVERVIEW OF SYNTHESIZERS, PART II

By *Devarahi*

34

After exploring analog synthesizers in Part I in the April 1982 issue, Devarahi now takes a look at digital synthesizers. Some points in picking, pricing and purchasing the right synthesizer for you are also included.

### RECORDING WITH STEVIE NICKS

By *Stan Hyman and Vicki Greenleaf*

38

"Belladonna" is a poisonous plant, but it can also mean "fair lady" when it's translated from the Italian. *Bella Donna* is also the title of singer Stevie Nicks' super-successful debut solo album. The "fair lady" with the raspy voice and the bewitching stage persona spoke with *MR&M* about the pleasures and pains of recording without the Mac.

### STUDIO NOTEBOOK, #7

By *James F. Rupert*

46

Positioning yourself in the marketplace properly can influence both the purchases you make, as well as the success you'll have using that equipment. Taking a look at what your strong points are (they may surprise you) is what it's all about this month.

### PROFILE: THE TUBES

By *Jeff Tamarkin*

48

Outlandish is a mild word for The Tubes, and somehow it just doesn't do justice to the band that brought spray paint and humor to rock. Members Welnick and Steen spoke with *MR&M* about the evolution of this constantly surprising band.

#### COMING NEXT ISSUE!

*Recording With Bill Wyman*  
*Direct-to-Disc Super Session*  
*Recording Techniques, Part IV*

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The technical Q & A scene.

### THE PRODUCT SCENE

By *Norman Eisenberg*

24

The notable and the new, with a comment on waiting for Godot, audio style.

### MUSICAL NEWSICALS

By *Fred Ridder*

30

New products for the musician.

### AMBIENT SOUND

By *Len Feldman*

52

Now that digital audio has whetted our appetites for greater dynamic range, it's time to check out some noise reduction innovations that can give us close to digital audio quality right down to our "Walkmans."

### NOTES

By *Brian Roth*

54

A pickup primer! Believe it or not, those magnetic pickups on your guitar or Fender Rhodes piano are adjustable, but before you start tweaking at them, here's a look at what makes them tick.

### LAB REPORTS

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and *Len Feldman*

58

Ecor MA 125 Mixer Amplifier  
Micmix Dynafex Noise Reduction System  
Optonica RT-6605 Cassette Deck

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74

Reviews of albums by Carole King, Karla Bonoff, Phil Manzanera, Chaka Khan, Frank Lowe, Dizzy Gillespie and the Rova Saxophone Quartet.

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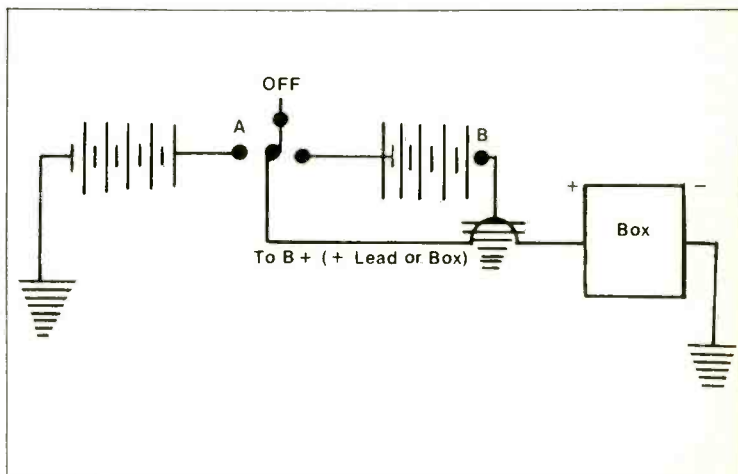
# LETTERS TO THE EDITOR

## Active/Passive

A few comments about the active/passive guitar debate:

1) It is possible to get around the noise and loading effects (even w/single coil pickups) without resorting to complicated on-board electronics. The answer is low-impedance pickups, as per the Les Paul "recording" models. Les has been doing this for forty years, and he does things in the studio in 1/10 the time (and at one tenth the cost) that any other producer would (Advice to collectors: dump the sunbursts and buy 10 low-impedance jobs with the money. They are the last good buy in Gibson solid bodies.)

2) Catastrophic failure is probably no more likely in the "canned" packages than is amp or PA failure. The retrofit or Luthier market systems are preferable, because they are more compact, easier to change as a unit, and much cheaper to replace. As for batteries, my suggestion is to use two, wired in this way:



Up kills power, down or up for either battery. Do not use jack activated power switches as these short out often. On Strats, stick them up the jack hole (the batteries, that is—pull the jackplate, insert the battery in the wood opening. This obviates the necessity for pickguard pulling and necessary restringing, which I like, as I restring manually and batteries don't go the distance).

3) An onboard amp is a good compromise between the passive system and the full-tilt EQ/amp/compressor system. It is fail-soft. The ax works even if the system doesn't, and is childishly simply to install. Also, it is tiny and dirt cheap. It eliminates loading, and boosts the hell out of the signal, and reduces noise. For strats, Alembic's blaster is number one. Non-strat players are S.O.L. at present, unless they wish to build their own. Try EMG pickups with built-in amp circuits.

4) I think onboard wireless is a rotten idea, for the following reasons:

A) Current guitars haven't the space needed, new ones would have to be allowed (no sustain!).

# Listen to Jay Graydon, Steve Lukather and Dean Parks and You're Listening to Ibanez.



GRAYDON



LUKATHER

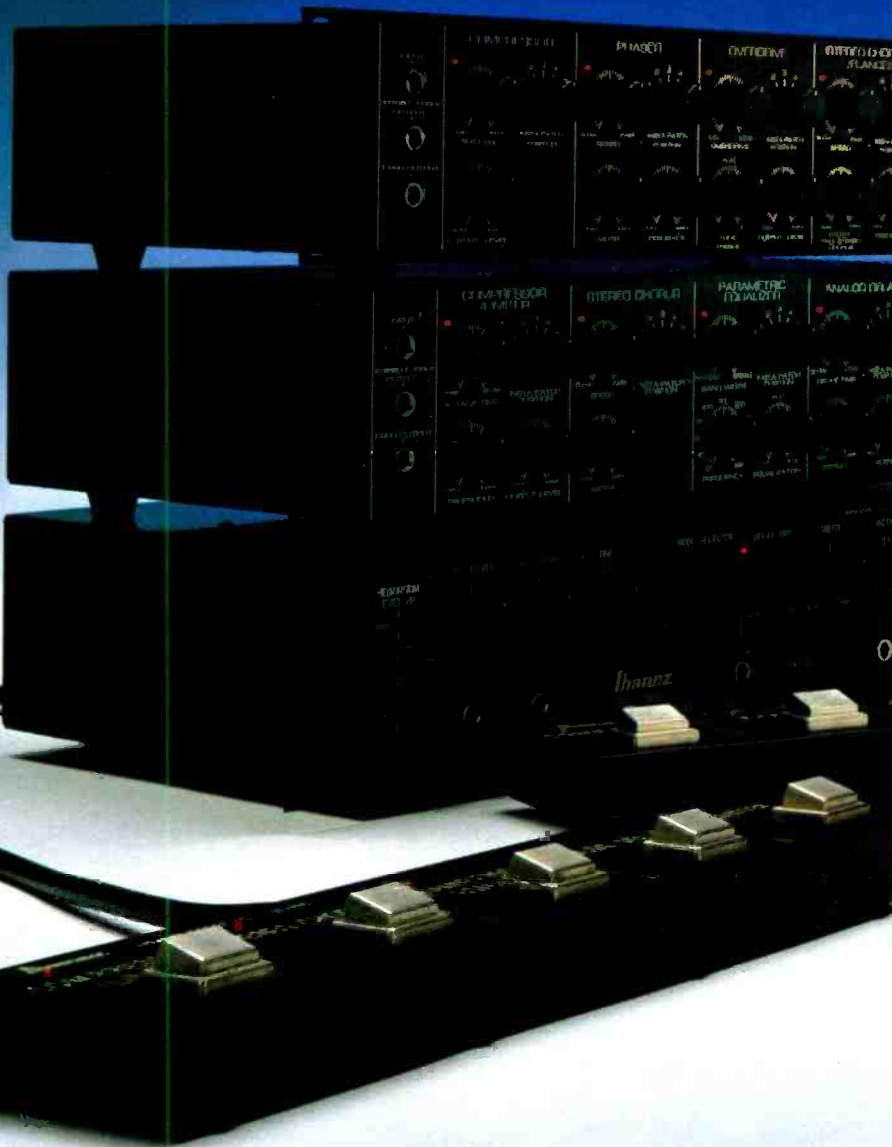


DEAN PARKS

**UE400**  
**MULTI-EFFECTS**  
 19" rack mount  
 Compressor  
 Phaser  
 Overdrive  
 Stereo Chorus/Flanger  
 External Effects Loop  
 Insta-Patch patching matrix  
 Remote FET footswitch panel

**UE405**  
**MULTI-EFFECTS**  
 19" rack mount  
 Compressor/Limiter  
 Stereo Chorus  
 Parametric EQ  
 Analog Delay  
 External Effects Loop  
 Insta-Patch patching matrix  
 Remote FET footswitch panel

**AD202**  
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 19" rack mount  
 Delay, Doubling, Stereo Chorus  
 and Flanging modes  
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Just listen to the playing of studio greats Jay Graydon, Steve Lukather and Dean Parks and chances are you're listening to the sound of Ibanez effects. Each of these guitar monsters uses the Ibanez UE400 and UE405 Multi Effects Units and the Ibanez AD202 Analog Delay

in his bag of studio tricks. Why? Because they're clean, quiet, versatile and most of all, they sound great. Wherever you play—live or in the studio—use the next generation in effects—Ibanez.



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# If you're ready to move up to a specialized mixer, you're ready for Ramsa.

## The Sound Reinforcement Specialist: Ramsa WR-8716

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

The WR-8716 is a fully modular sound reinforcement console with 16 input

modules, 4 group modules, and 2 masters. It features 16 input pre-fader solo buttons, 4 group modules with pre-fader insertion patch points, and lockable post-fader solo buttons. There are 6 illuminated VU meters with peak LED's for easy outdoor

reading and a separate stereo variable frequency EQ for monitor sends. Pan pot controls allow panning to the left or right masters while level controls permit 16 x 6 board operation. The left and right direct channel assign function lets you bypass the group modules for individual sources. Portable operation is a snap with easy access connectors.

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





# RAMSA

## The Recording Specialist: Ramsa WR-8816

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

You'll command a variable frequency EQ section with 3 frequency settings for the high and low frequencies plus continuously variable

midrange. Stereo echo send replaces the separate mono controls you'll find on competitive boards. And you get two independent stereo monitor controls—one for musician's headphones, one for control room monitors—a special feature for any mixer in this class. And there are other important features

like low noise electronically balanced m.c. inputs with new high-speed IC's, 16 switchable post-fader solo controls and XLR-type mic connectors.

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



**Panasonic**  
PROFESSIONAL AUDIO DIVISION

CIRCLE 192 ON READER SERVICE CARD

B) Power requirements are very high.

C) A good wireless unit (no cheapies!) is too expensive for 80% of the players.

D) Anyone with the moxie to wire an onboard active ax package (this includes more than one sixth grader and a lot of high school kids who'll do anything for kicks. I did it once, to a bully who had a wireless in school—five years ago) can build a transmitter/tape pack which will feed his own taped signal into your amp, P.A., and out! Imagine, if you will, some teenager's voice saying "David

Lee sucks ----!" (or some such) coming over Eddie's guitar at the next Van Halen gig. Don't laugh. It could and will happen, and it alone is good enough reason to avoid using wireless.

5) Don't buy any onboard system you can't afford to scrap, without playing it extensively first. Quite a few are junk, and one or two perform well but are designed to run at 100% capacity, the theory being that they will be replaced every six months or so by their rock star owners. (This is known as the boogie theory, after the boogie amp which, though performing well,

eats its own weight in tubes annually.)

Keep up the good work!

—Rob Johnson  
Shawnee Mission, KS

### Auratone

Could you please print the address of Auratone? They make monitors that I am interested in purchasing, but I don't know where to reach them.

—M. Rothlisberger  
Studio M&M  
Schweiz, Bankverein Aarau

*Auratone is located at:*

*P.O. Box 580  
Del Mar, California 92014*

*The phone number there is:*

*714-453-2334.*

### Heavenly Gates

I want to thank you for the fine magazine you publish and for the many benefits I've derived from it.

I have an eight track studio in my home and look to your magazine for answers to many problems that arise as well as a variety of information that prevents problems cropping up in the first place. I wish to thank also, Jon Gaines who, among others, presents articles from time to time on projects one can build.

Recently I built the noise gates detailed in the November 1981 issue. They work! And they work beautifully! (I built a pair and mounted them in my outboard equipment rack.) Not only are they a tremendous help in a number of recording applications, but they saved me much money and were a fun and easy project to construct. In addition, I correspond with Mr. Gaines, and found him to be a more congenial and helpful person.

There is no question that the continued improvement in quality and growing success of my studio is due in a large part to your magazine and to all those who contribute to it. My gratitude and keep up the fine work.

—Alan J. Weckler  
Oceanside, CA

### Will the Real DN 30/30 Please...

*I'm afraid we were in error in our April 1982 issue in the Product Scene column. The photo that we ran with the article on the Klark-Teknik DN 30/30 was actually a photograph of the DN 60 Real Time Analyzer System. So we are running, in*

## LOGEX™ Professional no-hassle recording

Since any recording task worth doing is worth doing well, an important priority is choosing the right tools. You need a professional console which gives you flexible control over the sound, designed with the logical simplicity that gets the job done right with a minimum of hassle.

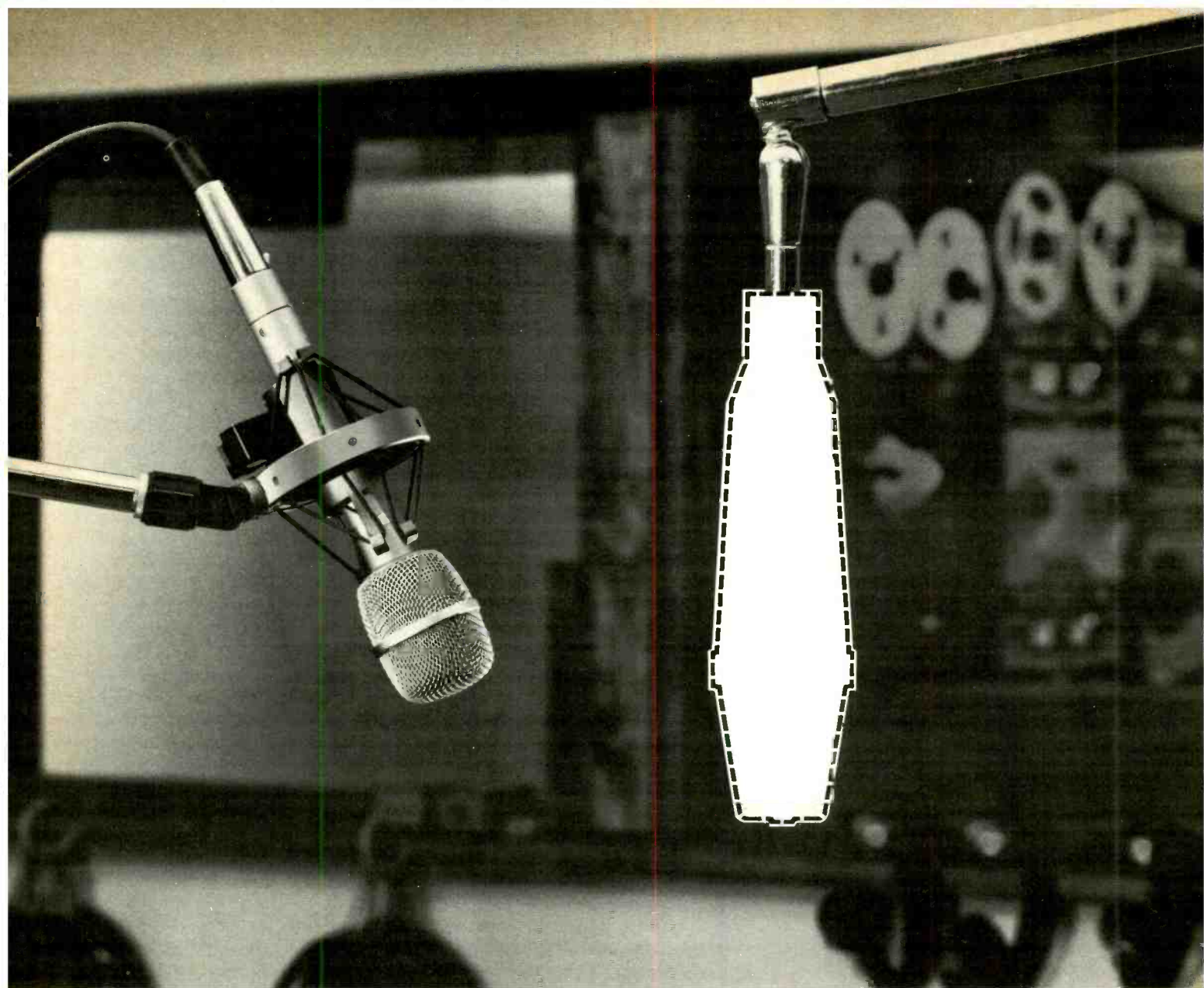
The "New Breed" Logex Series consoles represent a departure from other approaches by providing clean, professional sound that reflects the straightforward philosophy of signal flow found in Sound Workshop's larger, world-class consoles.

A **step-up** from imported units compromising professional quality for price and cosmetics, Logex is a sensible **step-down** from complex and high-priced consoles. Its design intelligence is revealed in a clean, uncluttered layout with color-coded graphics. Logex is available in two mainframe sizes for 8 or 16-track recording. All of the important functions are concentrated into one "human-engineered" design.

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# 10 to 1 you'll like ours!

Every studio needs a \$1,000 microphone. It tells everyone you're serious about good sound, and it impresses the talent.

But when the session gets under way, all that counts is results. Not price tags. And judged *only* by what you hear, the new AT813 Unidirectional Electret Condenser from Audio-Technica is going to truly impress you...at about 1/10 the cost you might expect.

Recently a recording engineering class at a major university made simultaneous multi-track tapes comparing our AT813 side-by-side with some of the best microphones money can buy. The informed and critical students did the judging.

Surprisingly, in many cases they couldn't find a nickel's worth of difference. And some preferred the AT813 sound to the expensive competition.

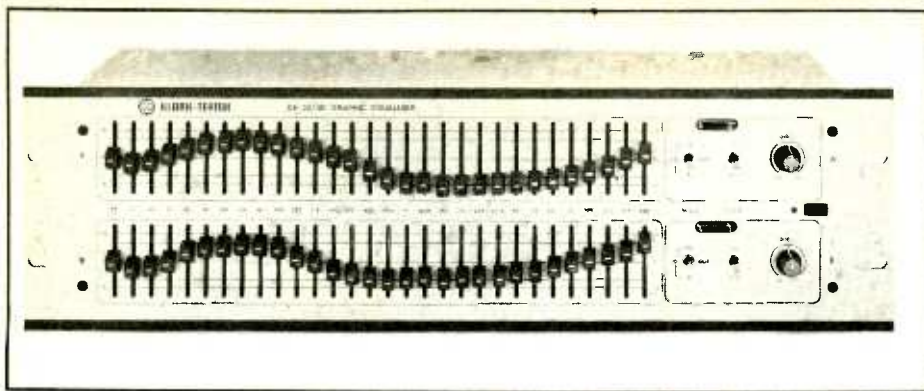
You may agree with these student engineers when you hear the AT813. Or you may not. But at these odds, you can't afford to overlook us. And for new studios just getting underway, who can't afford a roomful of top-dollar microphones, the AT813 is an effective way to achieve full multi-mike capability. Write today for the AT813 spec sheet and A-T microphone dealer list. Then see your Audio-Technica sound specialist for great sound...right from the start.



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CIRCLE 102 ON READER SERVICE CARD



this Letters column, a photo of the DN 30/30.

We apologize to Klark-Teknik, and to you, our readers. Hopefully this picture will be worth a thousand apologies.

### The Berlant Market

Since you printed my letter in your November 1981 (see "Berlant?" page 12) issue, I have received an outstanding response from your readers. (See also "Breaking Down the Berlant Wall," February '82, page 4.) At the time that I was writing that letter, I was feeling that I would *never* repair my Berlant Recorder but my attitudes have changed considerably. Presently, I have a more than ample supply of information concerning the unit, and I would like to thank you for printing my letter and your readers for responding. I was overwhelmed with the fact that those who responded expected only the consideration of receiving additional information that I might stumble across. (Information will be sent to those who request it.) Once I have arranged the information, I will send you copies for your files should a similar situation occur again.

The manuals and schematics have given me a new insight into the workings of the machine, however I lack the parts necessary for repair. As a 17-year-old with a great appreciation of the audio world and its opportunities, I would like to call again upon your most helpful readers. Should any of them be interested in selling their Berlant equipment or parts (specifically Berlant Series 30 Recorders), I would be equally interested in purchasing. Condition will be considered, but I doubt that they will be refused. Once I have gained the needed parts, the rest will be sold to anyone needing the aid that I have requested.

I will try to be very reasonable considering the situation, and I hope to gain similar response as with my

previous letter. I want to see all Berlant owners worldwide (many of us are scattered over great distances) to be able to enjoy their equipment as much as (if not more than) myself. All responses will be answered promptly.

Those interested should contact:

Ivan Baran  
Rd. 2 Hometown Box 106  
Tamaqua, Pa. 18252  
or  
(717) 668-1825

Thank You.

—Ivan Carl Baran  
Tamaqua, Pa.

### Climbing the Ant Hill

It was a hard reality to come to terms with, but alas, Ellen Zoe Golden's review of Adam and the Ants' *Prince Charming* was painfully accurate.

I recently bought the album hoping it would be better than its best art, "Stand and Deliver." I see genius in the album—however much in the raw. After all, "If evil be the food of genius/There aren't many demons around." At this point, I'd say Adam is only a small devil. For the sake of Adam and the Ant People of the world, let's hope he becomes a *monster*.

—Jocelyn Dumaresa  
Winoshi, Vt.

### Definition

I recently heard the term "custom label" used. What does it mean in the record business?

—George Crichton  
Houston, TX

*A custom label is distributed by a major label, and enables the producer-owner to function independently in the areas of deciding which artists to sign, how much to pay them, what to record, and when to release the product, as well as how to promote it to radio stations, record stores, and to the public in*



EV-Tapco products can be seen at these and hundreds of other fine dealers all over the country.

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Specialty Guitar Shop

# "The EX-18 could well become a classic audio tool"

June 1981 Modern Recording & Music, ©1981 Cowan Publishing.

That's what Modern Recording said about the EX-18 stereo 2-way/mono 3-way electronic crossover. The same statement could very well apply to the new TAPCO 2210 and 2230 graphic equalizers as well.

The EX-18 provides all the necessary controls and functions for bi-amplifying stereo or tri-amplifying monaural speaker systems, and this can be accomplished

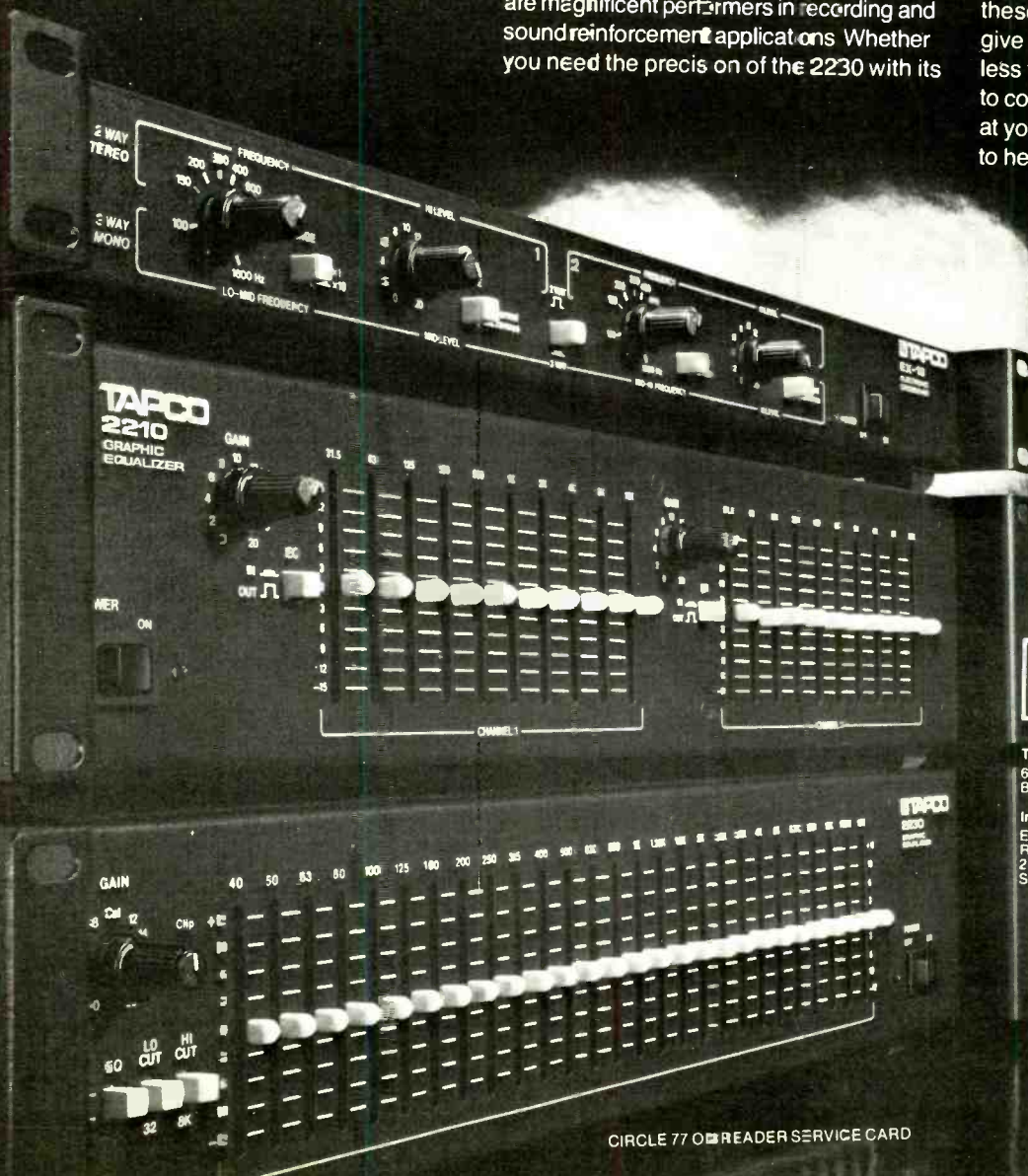
using a unique mode switch so no external patching is required. A single knob on each channel adjusts the crossover frequencies, with a 10X multiplier available for very high frequency crossover operation. It is definitely one of the cleanest and quietest electronic crossovers available.

The same precision design and human engineering found in the EX-18 is found in the one-third octave 2230 and the dual ten-band 2210 graphic equalizers. Both are magnificent performers in recording and sound reinforcement applications. Whether you need the precision of the 2230 with its

combining filter action, switchable high and low-pass filters and floating balanced outputs, or the economy and flexibility of the 2210, there are simply no better values in today's marketplace.

All three units are equipped with removable security covers to prevent accidental operation of any of the controls once your requirements have been set.

There is no need to settle for less than the best sound available. Especially when these E-V/TAPCO signal processing units give you professional sound quality for less than you'd expect professional quality to cost. These units must be auditioned at your E-V/TAPCO dealer. It's the only way to hear how good your sound can be.



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a gulton company

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Buchanan, MI 49107

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Box 520, 345 Herbert Street  
Gawanoque, Ontario K7G 2W1

In Australia:  
Electro-Voice Australia PTY LTD  
59 Waratah Street  
Kirrawee, N.S.W. 2232

In Japan:  
Electro-Voice, Ltd.  
6F No. 2 Taro Building  
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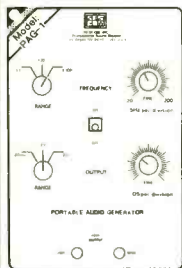
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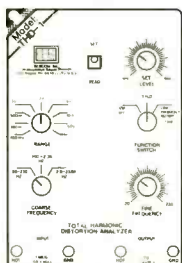
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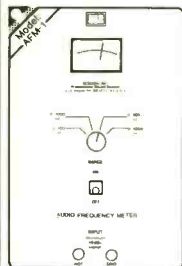
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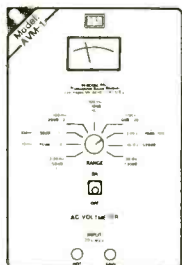
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## Thanks

We received the following letter directed to the attention of Joe Klee:

I just want to thank you for mentioning my song, "He's No Good For Me," in your review of Anne Marie Moss' album, *Don't You Know Me*. (See Groove Views, March 1982 issue, page 80.)

It's especially gratifying for an unknown songwriter like myself to receive good press, and I very much appreciate your singling out that song!

Again, thank you!

Marilyn J. Harris  
Red Letter Music Co.  
New York, N.Y.

## The Missing Stash

In the 1982 issue of *Modern Recording & Music*, we printed a review by Joe Klee on the New York Saxophone Quartet. We neglected to note that the release is on Stash Records, with catalog number Stash ST 210 to be precise. However, we can only hope that all you astute listeners out there recognized Bernard Brightman's name among the production credits and realized that this was another fine Stash release.

## Five Good Hits

Your April, 1982 issue is a good example of why *Modern Recording & Music* is a prime source of information for our studio. We subscribe to 16 studio, audio engineering, and broadcast publications and yours always pro-

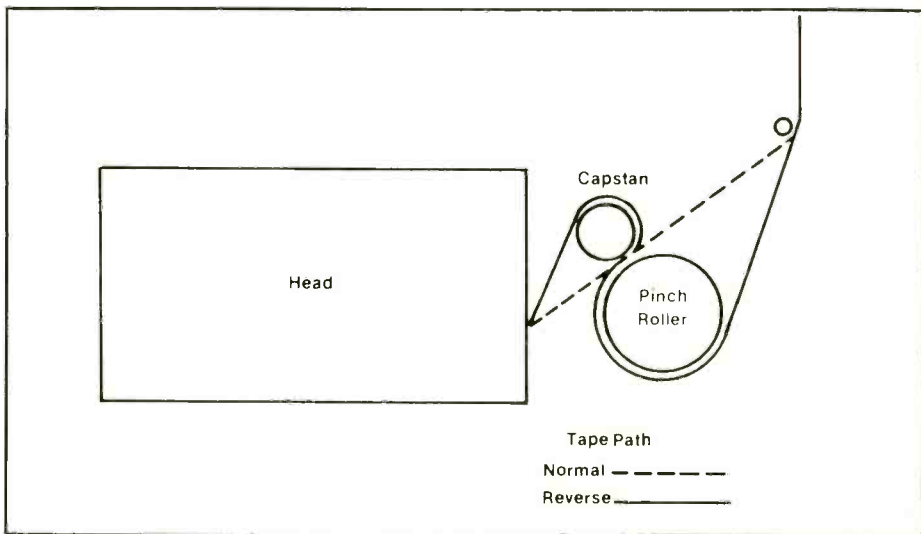
vides more useful information per issue than any of the others. April's issue hit home five times.

First, "Remember the Alamo" in Letters: I too have experienced problems with Craig Anderton's kits. Specifically—both compressors I built from scratch refuse to pass any signal at all, both noise gates I built from kits pass signals, amplify, and attenuate signals but do not gate. And, like other past readers, I experienced "clicking" on both Dual Limiters from PAIA—I modified one to the slower attack rate as described in a past issue and this provided a marked improvement.

Second, the letter entitled "Bouncing Along with dbx" in Talkback: The problem with dbx bouncing is not the bass bump (which I long ago learned to control) but instead the "Breathing" effect that occurs with increasing noticeability in additional generations. I stopped using dbx for anything more than one generation and just keep close tabs on the levels for other generations.

Third, the "Backward Approach..." in Talkback: Taking Mike Massena's editing tip one step farther, (please refer to illustration) if your machine uses a single capstan you can reroute the tape as illustrated by the solid line, press the forward control (I do not recommend using rewind or fast forward in this configuration), and presto, your machine runs backwards without reversing the reels. Place the tape mark described in Mike's letter just to the left of the erase head and go into "record."

Fourth, "The 'New' Life for an 'Old' Mic" in Talkback: We have two Shure BK-5B's and use these ribbon mics for a good warm vocal sound on certain voice-overs. I noticed in a recent used



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equipment newsletter that these mics were selling for \$225 each, that kind of a used price for an old mic speaks for the mic's desirability.

And fifth, the article "An Overview of Synthesizers" was excellent. It is very difficult to make comparisons using the manufacturer's information, as it is with most products, but it is even more difficult when all past articles in all publications only refer to a narrow field of synthesizers. "Overview" is not hampered by this tunnel vision approach.

Thank you for a fine publication.

—Mike Bailey  
Panama City Beach, FL

## Correction

Devarahi wrote to us to inform us of an error that appeared in his article, "An Overview of Synthesizers Part One," which appeared in the April 1982 issue of *Modern Recording & Music*.

Under Section (A), Pre-Set Synthesizers (p. 32, right hand column), examples given include the Minimoog. That should have read Minitmoog. The Minimoog is listed correctly in the next column, on page 33.

## Getting Published

I've been interested in songwriting for a long time. In fact, it is my hobby and lifetime dream to be a songwriter. My question to you is how do I go about getting my songs published and how do I go about getting a copyright for them?

Any assistance would be appreciated.

—Kecia Powell  
Phoenix, AZ

We refer you to a letter printed in the December 1980 issue of *Modern Recording & Music* entitled "The Hunt for a Seller of Songs," which appears on page 4. The information given there is drawn from the *Contemporary Music Almanac 1980/81* by Ronald Zalkind. It is published by Schirmer Books, a division of Macmillan Publishing Co., Inc., New York, 1980. That letter also refers you to another letter which appeared in the August 1980 issue of *Modern Recording & Music* which includes a graphic that explains the circuit of people and organizations that you'll have to go through in order to get your songs published.

You should find as many possible publishers as you can by checking the classifieds of your local phone book.

Listings of the big publishing firms appear every September in *Billboard's* Annual Buyers' Guide. Look in *Cash Box* and *Record World* also. They contain listings of publishers.

The music publisher will get the song to the right record company or the manager of an appropriate recording artist. Good publishers will try to get more recordings of your songs made by other performers. You should make a clear tape of your songs in order to present them. It is usually sufficient to have the song be accompanied by one instrument. You don't really need a studio production. If your own voice isn't good enough, have someone whose voice is good sing it.

If you choose to copyright before bringing your song to a publisher, you can get some copies of the required form, form PA, with instructions, free, by sending a postcard to the U.S. Copyright Office at the Library of Congress in Washington, D.C.

You'll have to have your music licensed. Your publisher may have a separate firm, one in ASCAP, BMI, or SESAC. You should phone or write them on your own to discuss things like royalties.

# TALK BACK

"Talkback" questions are answered by professional engineers, many of whose names you have probably seen listed on the credits of major pop albums. Their techniques are their own and might very well differ from another's. Thus, an answer in "Talkback" is certainly not necessarily the last word.

We welcome all questions on the subject of recording, although the large volume of questions received precludes our being able to answer them all. If you feel that we are skirting any issues, fire a letter off to the editor right away. "Talkback" is the Modern Recording & Music reader's technical forum.

## Professional Padding?

I have just purchased a Teac/Tascam Model 80-8 tape deck with DX-8 and I am in the process of looking for a compatible mixing board. These two pieces of gear, along with others, will hopefully be used to produce master tapes in the near future. Both the 80-8 and the DX-8 owner's manuals call for a line input of  $-10$  dB ( $0.3$  V) which, if I understand correctly, is referred to as low-level. As far as I can see, most professional mixing boards have high-level line outs and don't seem to be compatible with the 80-8 or the DX-8. My question is: Can pads be connected to the outputs of a

high-level mixer, or to the inputs of the 80-8, to produce a level of  $-10$  dB, since the owner's manual says that any level other than this will produce decoding errors in the dbx unit? "...don't put in more than  $.316$  volt as  $0$  VU, and don't make the tape playback zero anything other than  $.316$  volt either. Differing levels will produce decoding errors. To get exactly what you put in, it is necessary to get an exact  $0$  VU,  $.316$  volt in and out." (Quote from the 80-8 owner's manual.)

—Roger S. Netherton  
San Francisco, Ca.

Tascam offers a very complete line of professional mixers—all of which are compatible with the 80-8/DX-8 combination. The term "professional" has nothing to do with the output level of a mixer, but rather for whom and for what the mixer is intended. If you should happen to require less output from a particular device, such as a mixer, you can use a simple pad made from a  $2$  kohm pot or trim pot as shown below: (see *Figure 1*).

The mixer's output can be unbalanced by connecting pins 1 and 2 together. These pins then become ground. Pin 3 is "hot," and gets connected to the pot on the "high side," or clockwise rotation limit connection. The pot's low side goes to ground—common to pin one and two on the mixer—and the pot's wiper gets

connected to the "hot" pin of whatever connector you need, in this case, RCA. It's best to use a pot with a value in Ohms close to the manufacturer's stated output impedance or load recommendation for the mixer. There is nothing wrong with unbalanced shielding wiring. Test equipment manufacturers have been using little else for years—to measure minute signals down below levels that are useful to audio—in the picovolt area, that's  $10^{-12}$  Volts, or  $-240$  dB! Just set the desired output level from the pad's output using an audio voltmeter, and you're all set.

—Drew Daniels  
Applications Engineer  
Professional Products Group  
Teac Corp. of America  
Montebello, Ca.

## Reading Up On the Ins and Outs of Mixers

I am looking for some general information on hooking up 4- or 8-track machines to 4- to 8-track mixers. I don't understand a lot of the inputs and outputs on mixers. It's hard to find someone in this area who can explain this process to me, so I'm writing to you to see if there's a pamphlet or book available that explains these things. I am particularly interested in learning how to use all the plug-ins on the Teac Model 35 and the Model 3. Can you help me to find this information?

—Alfonso "T.J." Thompson  
Borger, Texas

Teac has a policy of selling owner's or service manuals to anyone who wants one. The later manuals for products like the Tascam series 30, have easy to read and clearly illustrated hookups and patching suggestions, as well as a wealth of information on basic recording techniques.

Teac offers a booklet called *The Multitrack Primer* for \$4.95 plus shipping,

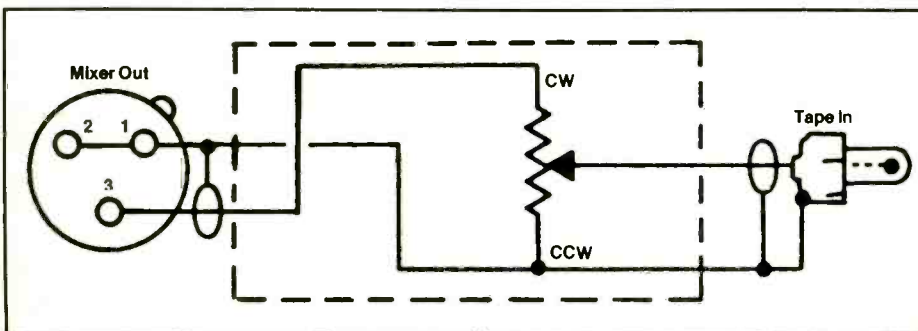


Fig. 1.



that can make you more effective at home or in your studio and probably also save you time and money.

Keep your issues of *Modern Recording & Music*—there are many valuable articles and references that will help you to eventually put all the pieces in place.

As a recording enthusiast or professional engineer, you will find reading to be one of the two best sources of information; the other being professional people whose work you appreciate. Here is a small list of reading materials you may wish to begin collecting. (I have excerpted the bibliography which we included in the operation/service manual that comes with the Model 38).

*Acoustics* by Leo L. Beranek (McGraw-Hill Book Co., Inc., New York, N.Y. 1954), quite readable although most concerned with exact formulae, note though, that it is not necessary to do calculations to get knowledge from this book, unfortunately, this book is out of print and copies are rather collector's items; *Music, Acoustics and Architecture*, also by Beranek (John Wiley and Sons, Inc., New York, N.Y. 1962), many useful stories on the interface of art and science, with a well-documented survey of concert halls; *Microphones: How They Work and How To Use Them* by Martin Clifford (Tab Books, Blue Ridge Summit, Pa., 1977), an excellent book for beginners: explores types, history and construction; *Acoustic Techniques for Home and Studio* by F. Alton Everest (Tab Books, Blue Ridge Summit, Pa., 1978), the easiest to read and understand of all the textbooks on this subject, also comes closest to dealing with the actual problems encountered in the home studio; *Handbook of Multi-channel Recording*, (Tab Books, Blue Ridge Summit, Pa., 1976), also by Everest, is clearly written, excellent for the beginner since it contains good information on all topics; *The Technics of the Sound Studio for Radio, Television and Film* by Alec Nisbett (Hastings House Publishers, Inc., New York, N.Y. 1976), although not specifically written for the tape recordist, it contains very practical advice for working with speech—commercial announcing, drama, etc.; *The Use of Microphones*, also by Nisbett (Hasting House Publishers, Inc., New York, N.Y., 1976), although the author's point of view is basically radio, he does translate difficult concepts very well; *Acoustical Engineering* (D. Van Nostrand Co., New York, N.Y. 1957) and *Musical Engineering* (D. Van Nostrand Co., New York, N.Y., 1959), both by Harry F. Olsen, both extremely valuable

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volumes—anything by Olsen is worthwhile—and the latter in particular will give scientific answers to questions in regard to translating one language into another—music to sound; *Acoustic Design and Noise Control, Vol. I* by Michael Rettinger (Chemical Publishing Co., New York, N.Y., 1977) highly technical, but clearly written and many examples are given to explain the math; *Modern Recording Techniques* by Robert Runstein (Howard W. Sams and Co., Indianapolis, Ind., 1974), an excellent basic survey, while the equipment dealt with might be a bit outdated at this point, the theory remains the same; and *The Audio Cyclopedia* by Howard M. Tremaine (Howard W. Sams and Co., Indianapolis, Ind., 1976) 1,700 pages that can surely answer any question you can think of, however, the author assumes that there is much prior knowledge, and so it can be best utilized in conjunction with some other, more basic volumes.

This should keep you busy for awhile!

—Drew Daniels

Applications Engineer  
Professional Products Group  
Teac Corp. of America  
Montebello, Ca.

## Group Reinforcement

Included in the April 1982 issue was a Letter to the Editor concerning a monthly column on sound reinforcement which I am sure many readers—including myself—would be more than interested in (see "P.A. Suggestion," page 12). Please give this idea strong consideration.

Now to my problem, which obviously concerns sound reinforcement. I am beginning to work with many gospel groups ranging in sizes from quartets to voice choirs. Presently I have access to ten Shure SM58 microphones for vocal coverage. These mics work fine for the quartets but I am not sure they are what I need for the twenty and sixty voice choirs which I sometimes work with.

I would appreciate any advice on choice and positioning of microphones to achieve the best reinforcement. I would also appreciate information concerning any books or publications which could aid in solving my problem.

Thanks for any assistance you can provide.

—Robert P. Commodore  
Minneapolis, Minn.

Time to hit the archives! W-a-a-y back in 1978 we published a piece by Bruce Swedien that should answer your questions regarding vocal miking and then some. Appropriately enough entitled "Vocal Miking Techniques" (November 1978, pages 62-66), Bruce explored in detail his recommended methods for miking everything from one or two singers right up to the large groups that you are dealing with (twenty to sixty singers). Complete with diagrams of recommended placements for both the singers and the microphones, the article should clearly show you some different methods to try. Bruce also included a list of his personal assessment of some of the more popular mics being used these days in both studio and reinforcement applications, which will be helpful to you when and if you decide to purchase other microphones. Perhaps most importantly, Bruce framed all his suggestions and recommendations on miking techniques within the context of the type of music you would be working with and through this approach offered points on how to bring out the various qualities of the different musical forms most successfully. While many of

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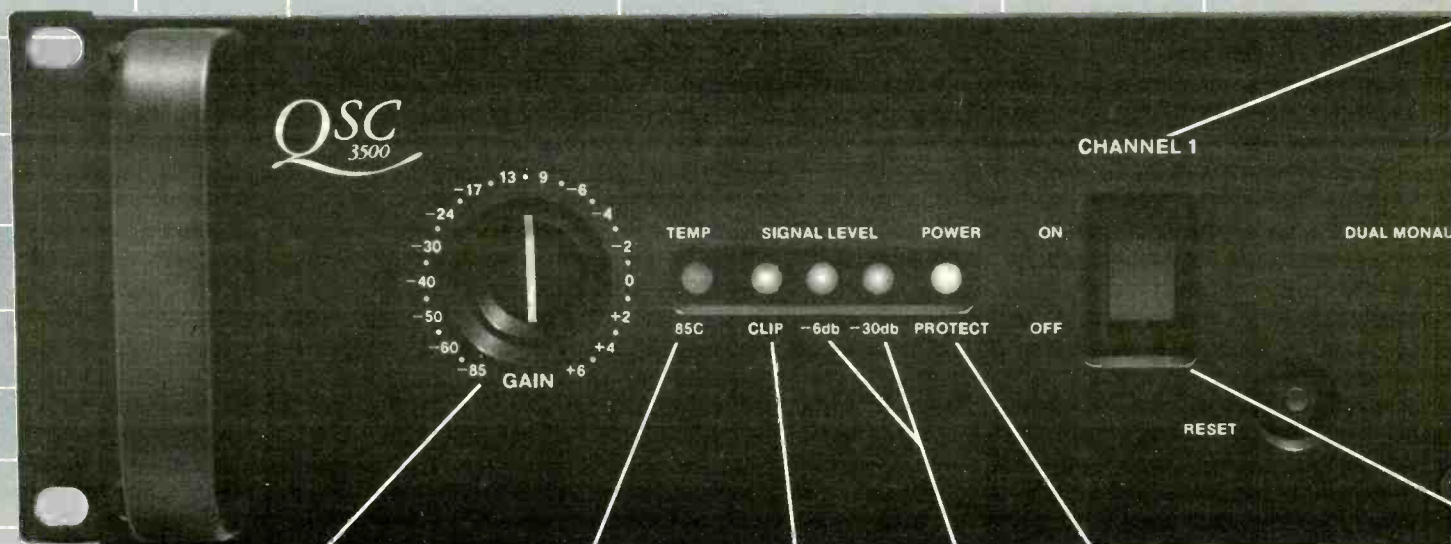
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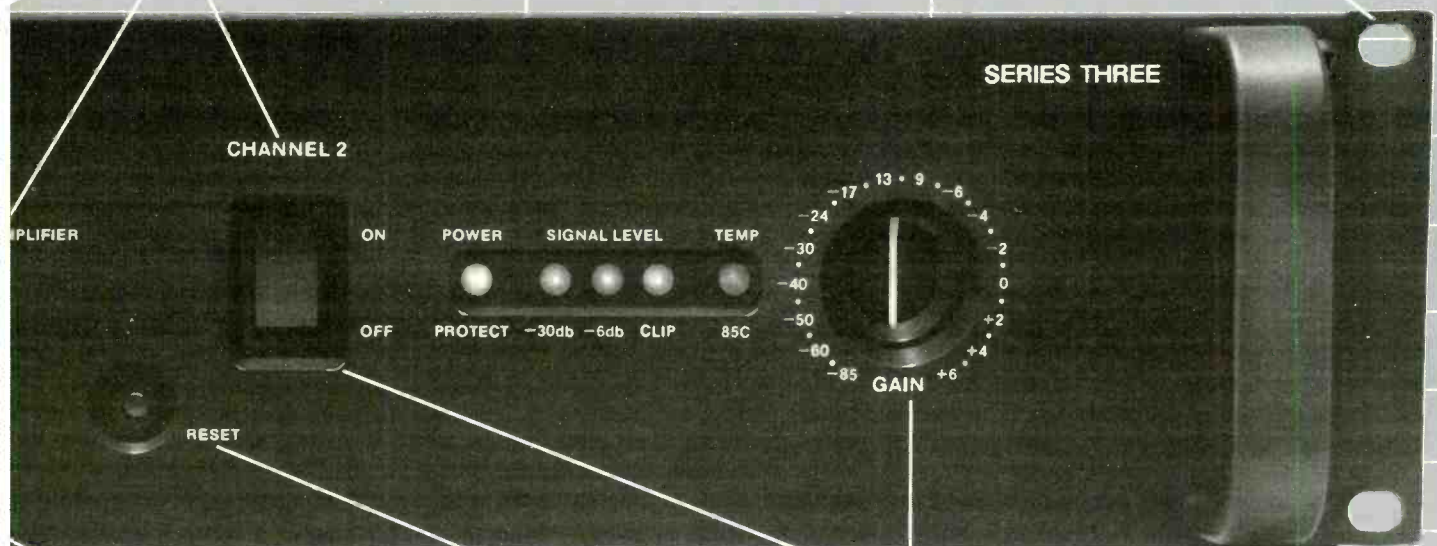
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Bruce's suggestions come from techniques he uses in the studio—and very successfully too, when you think of his track record; just ask Quincy Jones!—you will be able to apply much of this information to your “live” situation.

Elsewhere in this Talkback column Drew Daniels of Teac Corporation has offered a reading list of some of the most popular and important written works concerning the audio industry. Check out the books listed there for additional techniques and information concerning miking methods. In particular, I would suggest that you pick

up both Martin Clifford's Microphones: How They Work and How To Use Them and The Use of Microphones by Alec Nisbett (for both publishing information and synopses of these books, check out Drew's response). These volumes should provide you with greater insight into these tools, and thus assist you in utilizing them to the greatest degree of efficiency. One additional volume that should come in very handy for you is Music, Acoustics and Architecture by Leo L. Beranek which will be helpful to you in “sizing up” the various venues that your groups must perform in frequently.

## MXR Phase 100 Plus

I have an MXR Phase 100 that I'd like to add an extra “dry” (normal) output to. This would create two sends: 1) the phase shifter sound and 2) the normal guitar sound. Doing this creates a super “chorus”-type sound. Right now I am plugging my guitar into input number 1 of a parallel jack amp and then coming of jack number 2 into the MXR unit, then plugging this output into another amp. This is fine, except when I play outside my studio, I won't have access to an amp that has parallel jacks, plus there are some loading effects going on that reduce the volume of the first amp. Can you technical genius types help me out with this?

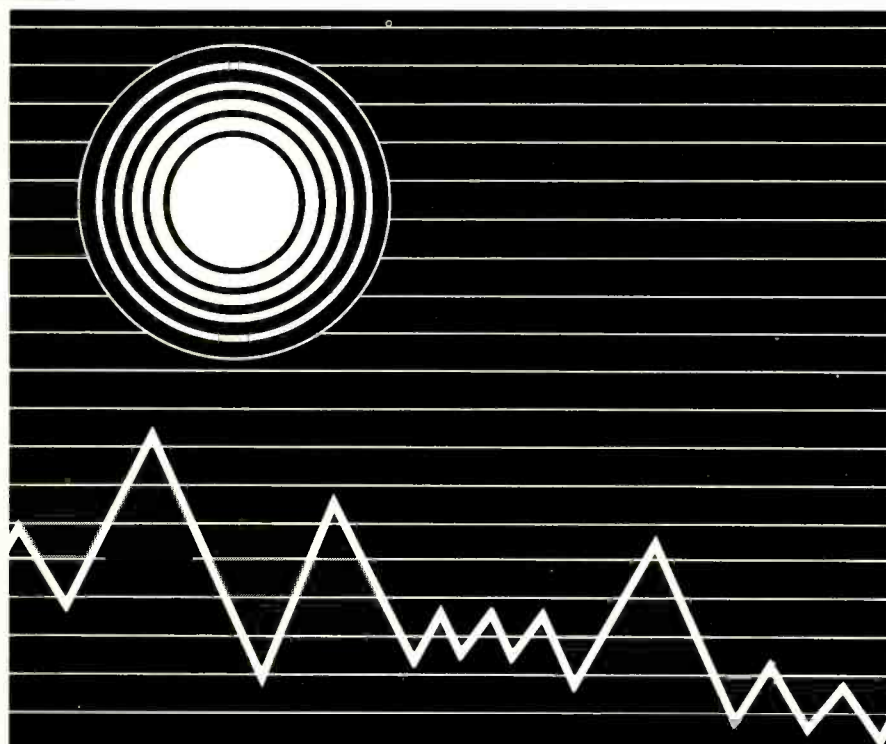
—Gary Gendron  
Huntington, W. Va.

An additional dry send can be created with the Phase 100 or any other effect by using an electric buffer to eliminate loading and a parallel jack arrangement or any “Y” cord. We recommend placing a Preamp or Micro Amp after the guitar and before all effects so the pick-up is buffered (electrically separated) from the rest of the circuitry. Typically one finds clarity and treble content restored when using a buffer in effects lines. Next run the output of the buffer to 2 parallel input jacks or use any “Y” type arrangement to give two signal sends. One “Y'ed” signal send goes to effects, then amp, and the other send goes directly to the “dry” amp.

Adding another jack in the Phase 100 can be done; however, exercise care when drilling the hole and protect the footswitch when the drill bit breaks through. Wire the hot pin of the input jack (yellow wire) to hot of installed jack and, likewise, ground to ground. (For details, see *Figure 1*.)

Another modification that is useful when operating in stereo is installing a “dry defeat” switch in the Phase 100 (see *Figure 2*). Since the Phase 100 electronically mixes dry and phased signal just before its output, when running a stereo with a stock Phase 100 the dry signal is imaged in the center with phasing effects on one side. With the dry defeated on the Phase 100, phase only signal and dry are blended physically from the left and right speakers. The result is a phase shift that swirls from side to side.

—Jim Kelsey  
Customer Service Manager  
MXR Innovations, Inc.  
Rochester, N.Y.



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CIRCLE 68 ON READER SERVICE CARD

# MAYNARD FERGUSON



His dedication to the art of making music is unbounded! Maynard seeks, finds and hires the **best** musicians, arrangers, composers and sound personnel who, along with Maynard, combine their special techniques and create a sound that has captured the ears (and hearts!) of music lovers **all** over the globe!

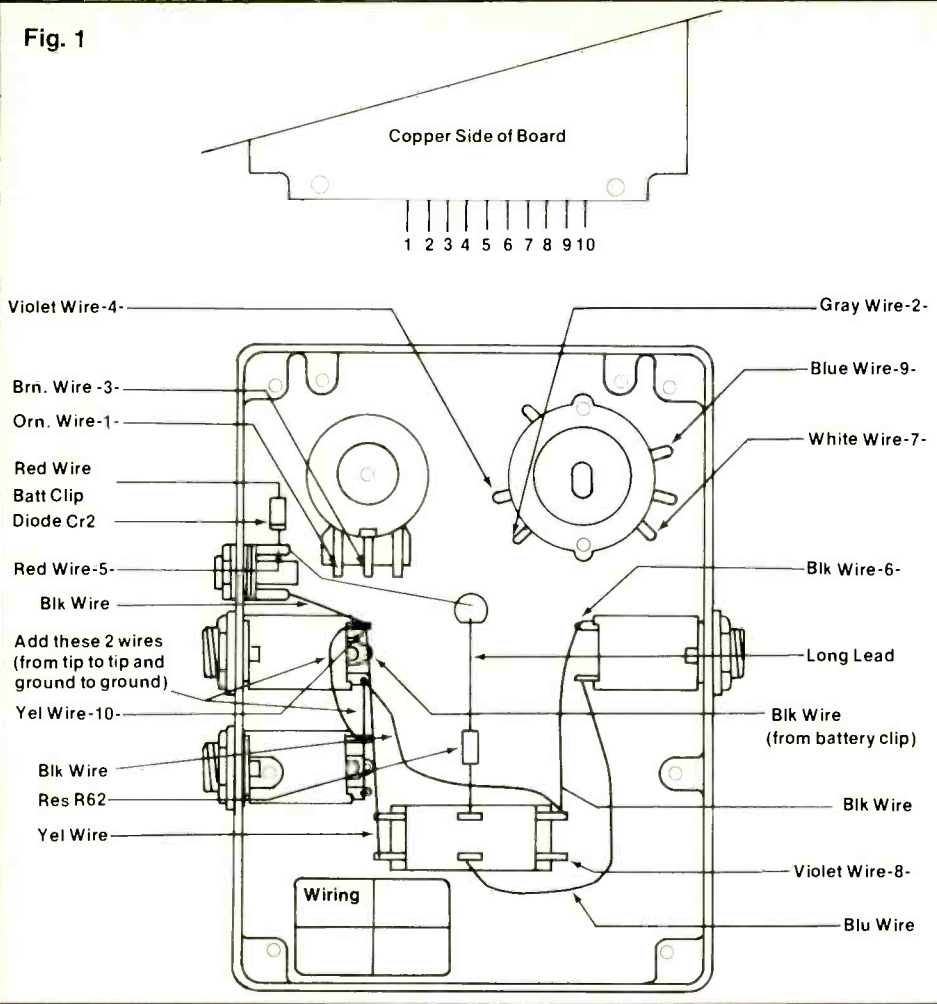
For many years, Maynard has taken his entourage on a hectic, and sometimes grueling, tour schedule playing to SRO audiences from the smallest clubs and college campus auditoriums to the largest concert halls in the world. These years of touring and playing in **drastically** different environments allowed Maynard to develop a great degree of knowledge about sound.

Because he had used and been impressed with our gear, Maynard expressed interest in Peavey equipment for his sound reinforcement requirements. To say we were excited **and** flattered would be an understatement. After discussing his needs with our engineers and technicians, Maynard and his soundmen chose our Project One™ Series, Mark III™ 24-channel mixing console, CS-800™ power amps, and EQ-27™ and stereo 10-band graphic equalizers for the main system. Their monitor system consists of our model 1245 bi-ampable monitor enclosures, CS-400™ and CS-800™ power amps and EQ-27™/stereo 10-band graphic EQ's.

Thank you, Maynard, for bringing us your music and for being a respected member of the Peavey Sound Family!



Fig. 1



**For Parallel Input Jack**

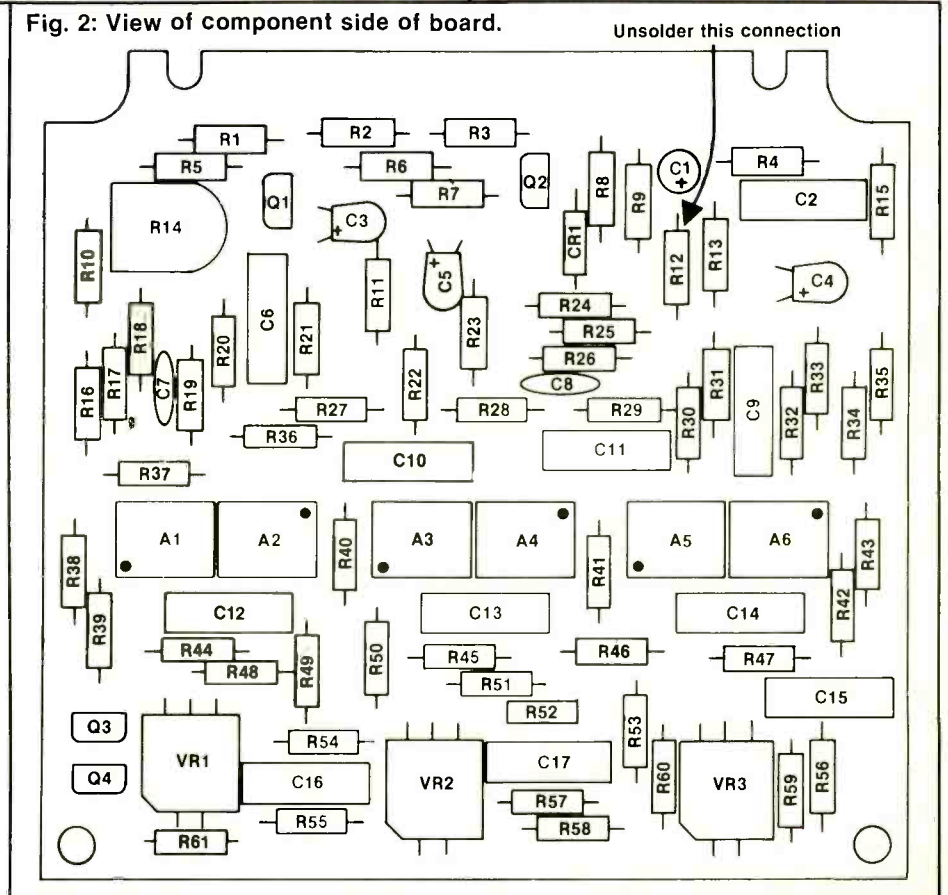
- 1) Remove back plate.
- 2) Drill hole for jack at location shown.
- 3) Wire to input jack.

**NOTES:**

Unless otherwise specified:

- 1) All wires: 24-gauge, tinned copper, stranded, PVC insulated.
- 2) Use wired printed circuit board assembly P.N. 107-3001-80X.

Fig. 2: View of component side of board.



**How To Install Dry Defeat Switch**

- 1) Remove backplate of Phase 100.
- 2) Drill hole and mount single pole single throw switch. (Recommended location: between speed and intensity pots; remove circuit board to drill holes).
- 3) Unsolder marked side of R12 (6.2 K ohms).
- 4) Connect one wire to trace that resistor was in and connect another wire to the lifted side of resistor.
- 5) Connect ends of wires to the two terminals of a single pole single throw switch.



# PHANTOM POWER *by Pearl*

*With all the potential problems in performing why make power one of them!*

Eliminate the power problem with Pearl's four new Phantom powered electret condenser microphones. They're designed to be used with an advanced power supply (PW-48) operated by an AC Adapter for trouble free power at all voltage levels. A battery operated power supply (PW-18) for 1 or 2 Phantom powered microphones is also available with a condenser coupling for leakage free operation.

A few of the many advantages of these new models are: • an internal amplifier (no output transformer needed)

- output voltage 3.5V at maximum SPL
  - current drain less than 3ma
  - 0.5% total harmonic distortion at high levels
  - internal attenuator switch increases maximum level allowing you to mike brass and percussion instruments cleanly
  - supply voltage is 12VDC to 48VDC (006P 9V battery with CR57-CR55)
  - CR45 with internal pop filter included
  - CR57 right angle unidirectional cardioid polar pattern
  - CR55 unidirectional cardioid polar pattern.
- Both CR55 - CR57 have a condenser element isolation system minimizing both stand and hand held noise.

The sound produced is both wide range and musical extending from 30 to 20,000 HZ, coupled with the quality and durability you have come to expect from Pearl. You will be making your best sound choice when you choose Pearl Phantom Powered Microphones.

A product of  
**Pearl International, Inc.**  
408 Harding Industrial Dr.  
Nashville, Tennessee 37211

**Write for complete specifications on these and other new exciting Pearl products.**

Sold in Canada exclusively by NUCO Musical Instruments, Ltd., Markham, Ontario

CIRCLE 108 ON READER SERVICE CARD

# THE **PRODUCT** SCENE

By Norman Eisenberg

## DENON ANNOUNCES NEW DECKS

Dolby-C noise-reduction is highlighted in both of the new cassette decks to be released by Denon. Both units also feature three heads, direct-drive capstan motor and Denon's proprietary tape-tension servo



sensor II system. In both recorders, all amplifier circuitry uses a direct-coupled configuration for extended deep bass performance and minimal phase shift. The two models are the DR-F6 (\$400) and the DR-F7 (\$500). In the latter, bias adjustment is automatic.

CIRCLE 22 ON READER SERVICE CARD

## RACK-MOUNTED VCA FROM PROTECH

Protech Audio Corporation has announced the addition of a new rack-mounted VCA to their product line. It is the 668VCA, is self-contained, so there is no necessity to wire in a power supply.

The Protech 668VCA comes with back panel terminals for audio in, control pot, and audio out for each channel. The channels can be strapped for single element control of multiple channels. It is available in 2, 3, or 4 channel versions, with or without balanced 600 ohm, transformer isolated outputs.

The 668 can provide 100 dB of attenuation. Maximum input is +20 dBV. It has a power requirement of 117 VAC/60 Hz, .25 amps.

CIRCLE 24 ON READER SERVICE CARD

## UPDATED PZM MIC

Crown's PZM-6S, using a new pressure capsule, is said to provide extended bass and smoother high-end response vis-a-vis the PZM-6LP which it resembles. The new mic is priced at \$349. Details on the Crown PZM series of microphones are available in a special brochure published by Crown.

CIRCLE 25 ON READER SERVICE CARD

## AVILYN TAPE TAKES NORMAL BIAS

From TDK there's news of a new Avilyn particle cassette tape that takes normal bias. Known as AD-X, the tape uses high density, cobalt-absorbed gamma ferric-oxide Avilyn particles, similar to those used in TDK's SA-X and SA high-bias cassettes. The new normal-bias version is said to provide a 1.5 dB wider dynamic range than previous TDK normal-bias tapes. At the same time, sensitivity has been increased by up to 2 dB in the high-frequencies, and MOL has been increased by up to 1.5 dB. The new AD-X also features a superior high-frequency saturation level and lower distortion. C-60 size costs \$4; C-90, \$5.50.



CIRCLE 26 ON READER SERVICE CARD

## NEW STUDIO MONITORS

Two studio monitors, the first ever from Cetec Gauss, are the model 7480 and the 7350. The former uses an 18-inch woofer in a 12.5 cubic foot enclosure, and a large model 4081 compression driver. Power response is rated as 20 Hz to 20 kHz. The model 7350 uses a 15-inch woofer in a 6 cubic foot enclosure with a model 2080 compression driver. Its response is given as 35 Hz to 17.5 kHz. Both models are bi-amped systems whose 4-ohm woofers can take maximum advantage of the output available from solid-state amplifiers.

CIRCLE 27 ON READER SERVICE CARD

## AUTO-REVERSE RECORD CASSETTE DECK

At \$300, the new Toshiba PC-G6R is claimed to be the lowest priced deck on the market that offers auto-reverse record capability. Instead of relying on tension on the takeup reel when the tape runs out, which causes a 15-second blank spot since the leader tape has no magnetic surface, the new Toshiba incorporates an infra-red detector that senses the leader and switches immediately, in less than 2 seconds. And rather than a shifting head mechanism, the PC-G6R



uses a rotary head system, which Toshiba says is more reliable and ensures high-quality performance in either tape direction. Rated response with metal tape is 20 Hz to 18 kHz. Wow-and-flutter are spec'd at 0.045 percent. The two-motor transport is solenoid-controlled and the deck has LED meters and linear slide level controls. A timer record function turns the deck on for recording at a preset time.

CIRCLE 28 ON READER SERVICE CARD

## COMPUTER MONITORS AMP

In the new Adcom GFA-1A power amp a mini real-time analog computer continuously monitors temperature, current and voltage and automatically shuts down the amp until the condition is corrected and normal function restored. Additional protection is provided by a built-in two-speed fan that cools the output transistors at high power levels. Peak indicator lights alert the user to near overload conditions prior to clipping. The GFA-1A is rated to deliver 200 watts per channel into 8 ohms at less than 0.05 percent THD across the audio band. The circuitry uses a "balanced bridge" output configuration and the unit is essentially two separate amps on one chassis. Price is \$450.



CIRCLE 29 ON READER SERVICE CARD

## BEYER DEBUTS BASS REFLEX HEADPHONES

Claimed to be the world's first closed system headphone to use a bass-reflex system is the Beyer DT660 which incorporates a ducted port for improved bass response. Weighing only 8.9 ounces, the DT660 has a response range of 15 Hz to 25 kHz. Impedance is 600 ohms. The SPL at 1 kHz is 96 dB and the headset can deliver up to 113 dB with no more than 0.5 percent THD. Price is \$95.



CIRCLE 30 ON READER SERVICE CARD

## NEW CASSETTE LINE

Three audio and two video cassettes have been announced by PD Magnetics, a newly formed company described as a joint venture of Philips and Du Pont. Offered as high performance tapes, the video cassettes include both the Beta and the VHS formats; the audio cassettes include the 1100 (metal bias); the 500 (CrO<sub>2</sub> high bias); and Tri-Oxide Ferro (normal bias).

CIRCLE 31 ON READER SERVICE CARD

## EQUALIZER INCLUDES TIME DELAY

A new stereo graphic equalizer, the Kenwood GE-1000 offers time delay and "depth control" in addition to twelve EQ bands per channel. The time delay is variable from 30 to 100 msec., and the echo effect may be varied from zero to 2.8 seconds. The equalizer action itself provides 12 dB of boost or cut on center frequencies of 16, 32, 64, 125, 250, 500, 1 K, 2 K, 4 K, 8 K, 16 K and 32 K Hz. Each slider is lit by an LED for greater visibility. Other features include tape-dubbing capability for two machines, and a pushbutton defeat/bypass. Signal-to-noise ratio is stated as 103 dB at 1 V output; 115 dB at 7 V output.



CIRCLE 32 ON READER SERVICE CARD

## DBX FEATURED IN CASSETTE DECK

Noise reduction of up to 50 dB, and dynamic ranges up to 110 dB are claimed for the BSR CX-300 cassette recorder which incorporates a dbx system. The deck also has Dolby-B and metal tape capability. Signal-to-noise, using metal tape with dbx on, is rated as 80 dB. Record/play distortion, using normal tape, is said to drop from 1.5 percent to 0.6 percent with the dbx switched on. Transport is full-logic solenoid controlled and independent bias and EQ adjustments are provided.

CIRCLE 33 ON READER SERVICE CARD

## DOLBY C AND HX IN NEW DECK

The top cassette deck-model CD401—in Harmon-Kardon's new "Ultrawideband Series" incorporates Dolby B and C plus Dolby HX. Using high-bias tape with the HX system, the deck is said to have a frequency response of 20 Hz to 27 kHz within  $\pm 3$  dB.



Other important features include separate record and play heads, metal compatibility, mic/line mixing, remote capability, electronic auto search and time control and record and bias-calibration tones which allow precise adjustment of bias and of Dolby levels. Price is \$750.

One step down in the new line is the model CD301 (\$530) which also has Dolby B, C and HX but which uses a combined R/P head.

CIRCLE 34 ON READER SERVICE CARD

## NEW REVERB SYSTEM FROM MICMIX

Micmix Audio Products has announced the release of the model XL-210 A reverb system which incorporates a new technological advancement that improves performance at a lower price. It is a new version of the XL-210 reverb system which has become a popular reverb device in sound reinforcement and small studio recording applications.

The XL-210 A is identical to the XL-210 reverb system as far as features are concerned. The differences arise in the sound and cosmetics of the unit. The new technology used enabled Micmix to add more high frequency reverberation and an improved transient response.

The XL-210 A is a 3½ inch rack-mount reverb system which can operate in either stereo or mono. Each channel has three bands of reciprocal peak/dip equalization, a Mix control, an Input Level control, and a dual colored LED which can also serve as a Power/Overload indicator. Reverberation decay time is about three seconds.

The suggested user price of this unit is \$890.

CIRCLE 35 ON READER SERVICE CARD

## TUBELESS VIDEO CAMERA

A small, lightweight color video camera—said to be the world's first that does not use any tube—has been announced by Hitachi. The new model VK-C1000 offers a high resolution of more than 260 horizontal lines for a "completely no-smear picture" through the use of a metal-oxide semiconductor that serves as an image sensor in place of a conventional tube. Claimed to be totally compatible with any VTR system on the market, the VK-C1000 also is said to provide the high reliability of solid-state components. Low power consumption (5.3 watts) and light weight (3.9 pounds) make the new camera very handy for outdoor use. Price is "under \$2,000."



CIRCLE 36 ON READER SERVICE CARD

## EXPANDER JOINS N-R SYSTEM

The new model 228 from dbx contains noise-reduction facilities as well as dynamic range expansion circuitry in one unit, said to be an industry first. The unit's simultaneous encode/decode function (similar to that in the dbx 224) makes the model 228 suitable for use with 2-head recorders, while providing full monitoring capability with 3-head recorders. It is designed to of-



fer effective noise reduction of 30 dB of headroom and dynamic range of 110 dB. In playback, the model 228 is claimed to increase the dynamic range of conventional program sources by as much as 50 percent, and of reducing noise from those sources by as much as 20 dB. It also enables playback of dbx-coded discs and cassettes. The price of \$499 includes rack mounts.

CIRCLE 37 ON READER SERVICE CARD

## A REPORT ON A NON-EVENT

Sometimes the things that do not happen can be as significant as events that actually do take place.

In this column back in September of last year I reported briefly on the noise-reduction systems that were demo'd at the Chicago C.E.S. in June, 1981. A large portion of the column dealt with the CX system announced by CBS. I also discussed B & O's Dolby-HX and mentioned that dbx was coming out with a chip or two that could put its system into a lot of equipment including car stereo units.

The HX system has of course materialized, and my first personal experience with it has been in terms of the B & O model 8002 cassette recorder which sounds mighty good. The dbx chip is in the works and will be in use by the time this appears in print *[see this issue's "Ambient Sound" column]*.

What is happening at CBS with its CX is something that still eludes my perception. In our December 1981 issue I devoted this entire column to CX, and pointed out among other things that although I had already received a CX decoder (the model SX-80 from Sound Concepts), I still had not received any CX albums. I also said: "If and when CBS, RCA or Warner decides to send albums we will of course listen and then make our comments. Those comments will then appear in these pages."

Following this bit of prodding, I received in the mail a list of CX recordings, and I was asked to indicate my choice of albums for auditioning. I checked off a modest sampling and waited expectantly. At last, I thought, I would be able to hook up my model 8002 and write some copy about CX.

But no. The return mail brought a brief letter from a CBS executive which I quote in its entirety:

"I received your note on the CX newsletter and welcome your interest in this technical breakthrough.

"We are keeping track of inquiries and would like to find out more about your affiliations, business, etc.

"If you would give us more information, we can better apprise you of the progress of CX."

How's that for a put-off? I am less concerned here about my bruised ego (I am, after all, listed in this and some other magazine mastheads, not to mention *Who's Who*). What really bugs me is that a major recording company is playing coy about what it calls a "technical breakthrough"—while smaller companies are putting their wares on the line for all of us to evaluate. So the question remains: Is CX for real or is it a publicity ploy?

# MUSICAL

# NEWSICALS

## MICROPHONES & ACCESSORIES

National Bandstand Products has announced an interesting new mic stand which instantly adapts to either straight or boom stand operation. National's stand uses a patented Adjust-A-Clutch which combines the functions of a boom swivel and height adjustment clutch into a single assembly for instant conversion from adjustable upright stand to infinitely adjustable boom. The stand is constructed from heavy-gauge tubular steel, heavily chrome plated for durability.

CIRCLE 4 ON READER SERVICE CARD

Available from Countryman Associates, Inc. is the "Isomax Pro," a directional lavalier microphone which offers up to 20 dB better rejection of feedback and unwanted sound when compared to other lavalier mics. Some of the Isomax Pro's features are: switch-selectable low-frequency roll-off and presence peaking; an ability to handle 150 dB of sound levels without distortion. The mic operates on phantom power or internal batteries, and has a balanced output with standard XLR-3 connector. Complete with case and tie-clip, the "Pro" lists for \$269.

CIRCLE 6 ON READER SERVICE CARD

Dean Markley Strings has announced a new product line which is rather a departure from the company's basic fare of premium guitar strings. The new product is the Artist series of acoustic guitar transducers. The Artist transducer incorporates a new Inertia Mass Construction design which responds to vibrations in both the horizontal and vertical planes unlike most pickups and transducers. The Dean Markley transducer is said to have extremely flat frequency response over the entire 20 Hz—20 kHz range. The Artist trans-

ducer is equipped with a 20 foot long low-capacitance cable terminated in a ¼" phone plug, and is compatible with all instrument amplifier inputs without requiring a preamp. The Artist transducer is housed in a 1" diameter housing with an attractive wood cover disk of oiled walnut, rosewood, or curly maple, and attaches to instruments with a special non-mar adhesive for temporary installation; permanent installation kits are also available.

CIRCLE 7 ON READER SERVICE CARD

Nady Systems has a new wireless system known as the PRO 49 system which offers virtually the same low noise performance of the Nasty Cordless Blue and Nady VHF wireless systems at a fraction of the cost. The Pro 49 system also has a 250+ foot range similar to its big brothers, and is said to be virtually indistinguishable from a cord over the audio range. Unlike many low-cost wireless systems, the PRO 49 is crystal controlled for fixed frequency operation for quick, reliable set-up and use. The system is very compact and light in weight (2½ ounces for the transmitter, 23 ounces for the receiver) and achieves



over 10 hours of operation from a single 9 volt battery. Two transmitter models are available: the GT-49 which terminates in a ¼" phone plug for use with any electric instrument including guitar and bass, and the LT-49 with an attached ECM-1025 electret condenser lavalier microphone for use by singers, actors, lecturers and clergy.

CIRCLE 8 ON READER SERVICE CARD

Moridaira USA is the distributor for the Rozz line of high performance guitar cords featuring flexible, noiseless cable that does not sacrifice ruggedness. Two cable weights are available, 6.5 mm and 8.0 mm diameter, as well as coiled cords, and a variety of connector types are available, including standard, right-angle, hexagonal and chrome and brass military styles.

CIRCLE 9 ON READER SERVICE CARD

## GUITARS AND BASSES

Lane Moller may not be exactly a household name, but for some ten years he has been counted among the top rank of custom guitar makers, building instruments for some of the world's pickiest pickers including Johnny Cash and [members of] Fleetwood Mac. Recently Moller's company, Lane Moller Guitars, announced the technologically advanced Moller OV Series 6- and 12-string acoustic guitars which Moller rather immodestly calls "the most significant advance in the acoustic guitar since the Dreadnaught." The most obvious differences between the Moller OV and a conventional dreadnaught are the elongated, oval sound-hole and the very full shape of the guitar's lower bout and its rather small upper bout. Less obvious at first glance is the instrument's unique reverse-taper body, which tapers from 4.43" deep at the neck joint to 3.125" deep at the bot-

tom of the lower bout. According to Moller, this combination of large, shallow lower bout and small, deep upper bout combine to focus the sound and direct it out the sound hole rather than "trapping" it in the resonance of the lower bout, while the oval sound hole allows more open area for the strings to vibrate into the body and increases the velocity of the sound leaving the guitar. The net result of these design aspects and Moller's patented hinged cantilever bracing is said to be a 25% louder instrument with exceptional balance. Moller can best be termed a fanatic about the materials he uses to build his instruments, using only the finest German Spruce and Brazilian Rosewood, widely recognized as the finest tonewoods for guitars but now virtually unavailable due to near extinction. Moller, however, stockpiled supplies of these woods some years ago, and figures he has enough to build about 346 more OV Series guitars, at which time he says he will retire rather than use the common but less desirable Sitka Spruce and East Indian Rosewood. Other details of Moller's guitars include an adjustable mahogany/maple/rosewood laminated neck with an ebony fingerboard and custom fretting, and custom-built, German tuning machines which are said to be more accurate than Schallers or Grovers.

CIRCLE 10 ON READER SERVICE CARD

Alembic, Inc. has added a new model, the Distillate, to its line of premium electric guitars and basses. The new model features Alembic's five-piece, laminated maple and amuranth wood, through-the-body neck and a three piece body with a mahogany core and front and back laminations of exotic hardwood such as koa wood, bubinga wood and walnut. The peghead has matching veneers, of course, and also has an Alembic logo in sterling silver inlaid into it. The neck features Alembic's compression/tension truss rod, and has an ebony fingerboard with mother-of-pearl inlays and is available fretless or with 24 frets. On the hardware side, the Distillate features Schaller tuning machines, an Alembic adjustable brass bridge and block, a bronze quick-change tailpiece, brass nut and brass backplate. The pair of wide-band, low-distortion Alembic pickups feed an active preamp electronics package with a rotary pickup selector, parametric-type EQ with frequency control and two-position "Q" switch as well as bass and treble tone controls and a



CIRCLE 11 ON READER SERVICE CARD

master volume control. The Distillate Bass augments Alembic's standard line of Series I and Series II instruments. Alembic's Series I is rather similar to the Distillate except that it has a complete stereo electronics package and has a less conventional, more distinctively Alembic body shape, while the Series II instrument adds a stereo master volume control, continuously variable "Q" instead of two-position switches and LED side position markers for those who like to play in the dark.

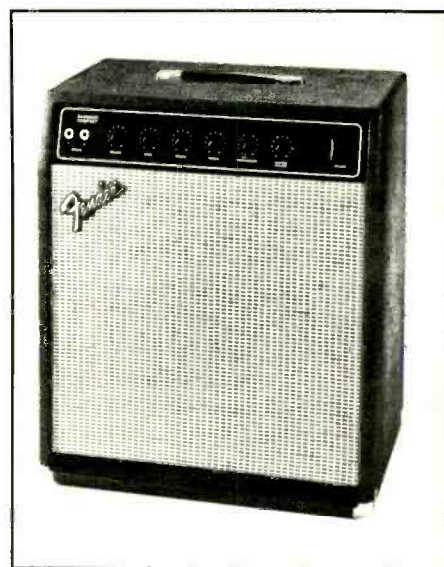
Gibson recently announced the introduction of two, all-new, electric, 6-string guitars known as the Victory guitars, both of which were designed to give the player an extraordinarily wide range of tonal variation thanks to innovative pickups and electronics. The two models share sculptured maple bodies and three-piece laminated, reinforced necks equipped with chrome-plated mini-Schaller tuning machines mounted on an angled peghead. The simpler of the two models is the Victory MV II CM, which features two pickups connected to a 3-position, blade-type, pickup selector switch and master volume and tone controls. The two pickups used are a Gibson Velvet Brick humbucking pickup in the front position and a new, Gibson Magna II magnet loaded coil pickup for a wide variety of sounds. The MV II CM features a rosewood fingerboard and is available in Candy Apple Red or Antique Fireburst finishes. The other Victory model is the MV X, an instrument which provides ten distinct tonalities through the use of three innovative

pickups controlled through a five-position blade-type selector switch. The front pickup of the MV X is a new design humbucker which uses one cream coil and one black coil, while the center pickup is a Super Stack, a new design with a magnet loaded coil on top of another coil. The rear pickup on the instrument is a new, split-coil Magna Plus B which is provided with a coil tap switch to yield a trebly, single-coil sound as well as the pickup's natural, full humbucker sound. The Victory MV X package is rounded out with a bound ebony fingerboard, Antique Cherry, Candy Apple Red or Twilight Blue finish and a Gibson Top Adjust Tune-O-Matic bridge.

CIRCLE 13 ON READER SERVICE CARD

## MUSICAL INSTRUMENT AMPLIFIERS

New from the oldest name in guitar amplifiers, Fender, is the Bassman Compact, a moderately priced, professional quality, solid-state bass amp. This compact (24" x 20 $\frac{3}{4}$ " x 13 $\frac{3}{4}$ ") combo amp combines a 50-watt RMS amp section with a 15-inch speaker in a bass reflex cabinet. High and low sensitivity inputs accommodate a variety of instruments while the Volume, Bass, Midrange, Tre-



CIRCLE 12 ON READER SERVICE CARD

ble and Master Volume controls give a wide range of sounds. An unusual feature of the amp is a compressor circuit with a threshold control and LED indicator to help control the dynamic range and prevent unwanted distortion and overload. The unit also has preamp out and power amp input jacks on its rear panel for connection of signal processors.

St. Louis Music Supply recently announced the addition of a new, high-power amp stack as part of its prolific Crate amp line. The new model is the Crate Condor CR-260, and at 260 watts RMS it is the most powerful Crate amp to date. The new model comprises a preamp/power amp head with a slanted front speaker cabinet on top and a square-front lower cabinet with its own slave power amp. Each enclosure contains two 12-inch speakers and the lower cabinet is ported. The amp head features Crate's Sequential Cascading Gain which is said to give the musician greater control and a wider range of sound than tube amps while producing a warm, tube-like sound quality. Controls on the amp include gain, bass, frequency-sweepable midrange and tre-



CIRCLE 14 ON READER SERVICE CARD

ble EQ controls with active circuitry, plus fat switch, bright switch and master gain. The unit includes an effects patching loop plus a balanced, low-impedance line output and a separate high-impedance line out with level control for connecting satellite amps or direct outs for sound reinforcement or recording purposes.

Also new from St. Louis Music Supply is the Micro Monster miniature amp, which is part of the company's Electra line. The Micro Monster is a tiny (hardly bigger than three 12 oz. soda cans) AC- or battery-powered amp styled like a full-size model down to the tolex-covered wood cabinet and strap-style handle. High- and low-sensitivity inputs are provided to allow the musician to get overdrive if he desires, and controls are provided for volume and tone. A headphone output jack completes the picture.

CIRCLE 38 ON READER SERVICE CARD

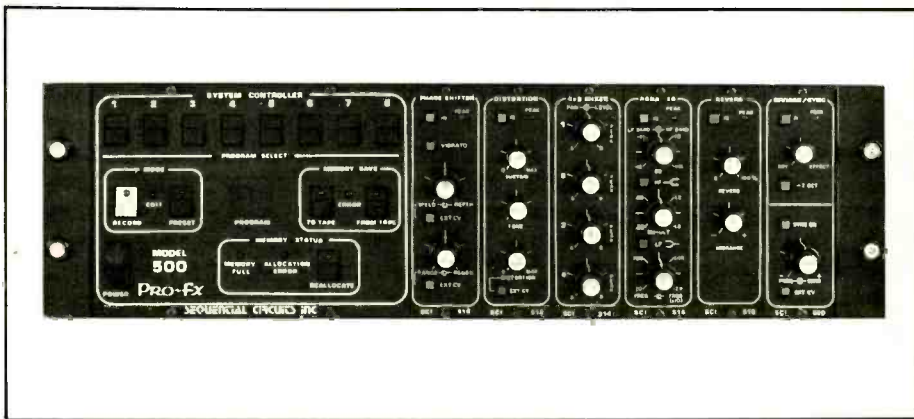
## SIGNAL PROCESSING SYSTEMS

Furman Sound has introduced a new product which is designed to give the convenience of a graphic equalizer but with much greater flexibility thanks to sweepable center frequencies in each band. The Furman SG-10 Sweep Graphic Equalizer is a ten-band unit with two-third-octave filters which may be used as a ten-band mono unit or as a stereo five-band unit. Each filter section has a linear slider with  $\pm 15$  dB range and a frequency tuning knob with a 4 octave (16-to-1) frequency range to provide sufficient overlap for any application. Available center frequencies range from a low of 16 Hz in band one to a high of 16 kHz in band five. Two input level controls with LED overload indicators are provided along with two switches each for EQ in/out and 80 Hz low-cut filters. Bi-FET IC circuitry is used throughout for low noise, low distortion and high slew rates.

CIRCLE 15 ON READER SERVICE CARD

Sequential Circuits, which is best known for its Prophet synthesizers and accessories, has branched out at least slightly into the field of programmable effects. The Model 500 Pro-FX system is a modular signal processing and mixing system featuring full programmability of effects changes. The system mainframe is a 5 1/4" rackmount unit containing power supply and program control and having space to accommodate up to

to sixty-four separate preset programs may be stored in the 500's memory. Any of the stored programs may be recalled by means of the Program Select switches on the front panel; if any of the controls or switches on the modules in use are moved, the unit will illuminate the Edit LED to indicate that the preset has been changed. For long term storage of presets, the unit's non-volatile memory may be loaded off onto a tape recorder (cassette or reel-to-reel) for later reloading into the 500. For even greater versatility, an optional external foot pedal may be selected to particular control destinations under program control. In addition, an optional footswitch unit allows remote program selection with a display of the current program. Five different modules are currently available for the 500 series system, with many more to follow. The initial group includes the Model 510 Phase Shifter, the 512 Distortion/Sustainer, the Model 514 4x2 Mixer, the 516 Parametric Equalizer and the 518 Reverb. The Model 514 Mixer accepts up to four line-level inputs and provides a level control and panpot—both programmable, of course—for each; several 514s may be cascaded for more inputs as needed. The Parametric EQ is a two-band unit with overlapping frequency ranges and switchable peaking or shelving operation modes. The 518 Reverb is a compact, 3-spring unit which features a floating threshold limiter on its input to help reduce undesirable "sprong boinginess."



CIRCLE 16 ON READER SERVICE CARD

six processor modules. A lower cost expansion frame can accommodate an additional eight modules, and up to three expansion frames may be powered and controlled by one basic mainframe, for an ultimate total of thirty processor or mixer modules. The Model 500 mainframe stores, recalls and allows editing of the settings of all the controls on all of the signal processing modules in use; up

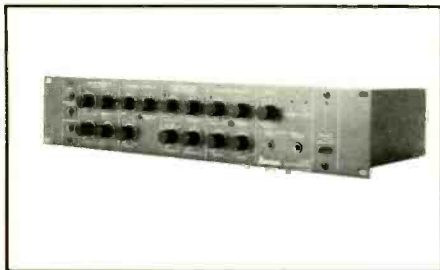
The STD-1 Stereo Tapped Delay from A/DA is a new multi-tap analog delay line designed for instrument or recording applications. The 1 1/4" rack mount unit has non-harmonically related delay taps and their relation to one another allow the user to generate a wide variety



of doubling, chorusing and ambience effects which would otherwise require a stack of separate delay lines to accomplish. The delay time may be set manually over a range of 1.3 to 55 milliseconds, or it may be swept for flanging, chorusing or doubling effects, or modulated at a higher frequency for special effects. A regeneration control allows a variable amount of signal to be fed back from one of three of the delay taps for echo and resonant flanging effects. The standard version of the STD-1 has unbalanced inputs and outputs, but balanced connections are available as options. Also optional with the STD-1 are a voltage control footpedal for remote control of delay time or sweep speed, and a dual footswitch for remote control of effect in/out and regeneration on/off.

CIRCLE 17 ON READER SERVICE CARD

Ibanez recently announced a new, rack-mount, multi-effects unit which is basically an expanded version of its UE400 system. The new unit is the UE405, and like its sister unit it combines four studio-quality effects into a single unit. The four effects include a



CIRCLE 18 ON READER SERVICE CARD

Compressor/Limiter, Stereo Chorus, a single-band Parametric EQ and an Analog Delay line. Like its sister, the UE405 features Ibanez' exclusive Insta-Patch system which allows the various effects to be connected together in any order simply by setting a couple of rotary selector switches. Where the UE405 differs from the UE400 is that the newer unit has provision for connecting an external effect unit which may be switched around as part of a 5-way Insta-Patch system. Controls on the UE405 besides the five, 5-position Insta-Patch switches include Attack Time, Threshold and Output Level for the Compressor/Limiter; Speed and Width for the Stereo Chorus; Bandwidth, Frequency (25 Hz to 10 kHz range) and EQ (+12 to -12 dB) for the Parameter EQ; and Delay Time, Repeat and Blend for the Analog Delay.



Audio/Digital Inc. has introduced a new Digital Delay Processor, the TC2. The new unit features an exceptionally long full-bandwidth (16 kHz) delay time of over one second, which may be optionally expanded to over two seconds. The device has a low-frequency control oscillator to sweep the delay time over a range of up to 4-to-1 for very wide flanging effects, and the unit has two delay taps to allow simultaneous positive and negative flanging as well as more conventional effects such as double-tracking and triple-tracking. A four-digit, real-time display of delay time is provided along with the unique feature of a user-adaptable digital I/O port which makes possible user or computer control of such parameters as delay time, output muting, bypass, repeat mode and VCO and flanging presets. Also unique to the unit is a new effect called Dynamic Pitch Tracking in which the delay time is controlled by the *pitch* of the input signal, making possible pitch-controlled flanging, and pitch-controlled double-tracking as well as other effects.

CIRCLE 19 ON READER SERVICE CARD

Sequential Circuits, Inc. has introduced a new, low-priced, monophonic synthesizer known as the Pro-One. The unusual aspect of the Pro-One is that it uses the same voice circuits as the company's famous Prophet-5 and Prophet-10 polyphonic programmable synthesizers, and hence shares the same sound quality as its expensive brothers. The unit has a 37-note keyboard with thumbwheels for pitch bend and modulation. The circuitry includes two VCOs with switch selectable waveshapes, variable pulsewidth and variable frequency plus octave switch, an audio mixer with controls for the two VCOs and a control for either the noise generator or an external source, a VCF with cutoff and resonance controls and an ADSR envelope generator, an amplifier section with ADSR controls and an LFO/clock. An ingenious modulation control panel allows two dif-

ferent modulation paths at any given time by selecting either direct or mod wheel routing of the three modulation sources (LFO, oscillator B or filter envelope) to the five modulation destinations (frequency and/or pulse-width of the two VCOs, and the filter). Other features not commonly found in a synthesizer of this price bracket are automatic glide, automatic arpeggiate, switchable keyboard priority, a two-sequence, 40-note sequencer and digital interface capability.

CIRCLE 20 ON READER SERVICE CARD

A few years ago it seemed that guitar synthesizers might well be the wave of the future, but at this point it seems that enthusiasm for the concept has faded except at Roland Corp. who recently expanded its GR Electronic Guitar System with the introduction of two new electronic guitars and a new, moderately priced guitar synthesizer module. The three new units are all totally compatible with the previously electronic guitars and the original GR-303 guitar synthesizer module, which all use a standardized 24-pin connector. The new GR-100 synthesizer module offers the basic functions of the GR-303 module in a functionally simplified form. A variety of electronic guitar and guitar synthesizer sounds are produced by the unit, which also features touch sensitive hex (one per string) filtering, hex distortion and electronic vibrato and stereo chorus effects. Both of the new electronic guitars are designed to be excellent electric guitars in their own right which can be expanded in function when connected to either of Roland's guitar synthesizer modules. Both these electric guitars feature fully adjustable bridges, solid maple necks shaped for speed and comfort and are offered in a variety of finishes. The Roland G-202 features two humbucking pickups while the Roland G-505 uses three low-hum single-coil pickups with a five-position selector switch and additionally features a tremelo arm.

CIRCLE 21 ON READER SERVICE CARD



# An Overview

# of Synthesizers

Part Two

by Devarahi

In our April 1982 issue we offered the first part of "An Overview of Synthesizers." In it we discussed the similarities and differences between the many synthesizers now available on the market. The article relayed opinions on synthesizer types from pre-set to modular, and compared some of the most popular models by their features.

"An Overview of Synthesizers, Part II" continues by explaining the digital synthesizers—expensive and not so expensive—which, today, are so popular. The article has been excerpted from the book *The Complete Guide to Synthesizers* by Devarahi (published by Prentice-Hall, Inc.)

## Digital Synthesizers

Some of the analog synthesizers already discussed are actually analog/digital hybrids, essentially analog but which use some digital control. Buchla's synthesizers use digital oscillators to insure extreme pitch reliability. Various synthesizers that are otherwise analog use microprocessor technology to store patch memory information. The Moog Source and Arp Chroma generate envelopes digitally.

The method used in the Oberheim 4-voice and Octave Cat SRM II to scan the keyboard is digital.

When people speak of digital synthesizers they generally mean the very expensive ones about to be briefly discussed. However, since the mass acceptance of microcomputers, other less expensive approaches to digital synthesis have become available: the control by a microcomputer of an analog synthesizer, and the creation of both hardware and software which allows the microcomputer itself to generate user-programmable sounds. *Polyphony* magazine has had an ongoing discussion about the first of these for several years; familiarity with *Creative Computing* [P.O. Box 789-M, Morristown, N.J. 07960] would also be very helpful in this area. Software and hardware for creating digital synthesizers is offered for the Apple II<sup>1</sup>, Radio Shack TRS-80<sup>2</sup> and Pet<sup>3</sup> microcomputers. Texas Instruments and Atari each manufacture a cartridge containing software for entering and playing music.

Digital synthesizers sometimes have over 100 wave generators and even more envelope generators; they possess the

ability to create each harmonic individually and then synchronize them in real time for great precision in instrumental simulation or other construction of sound. However, some synthesizer functions which are continuous (rather than discrete) by their very nature (like a sine wave or portamento) lend themselves more easily to production by analog equipment.



The first (and still the least expensive) digital synthesizer to become commercially available was the RMI KC-11. It has neither oscillators nor filters, but rather generates its waveshapes directly in its computer by assembling the contours in small digital segments. The digital computer drives a stereo digital-to-analog converter. There are thirty-eight individual and permanent waveforms stored in the system; computer cards supplement the permanent waveforms. The KC-II has twelve presets.

The Synclavier II is an 8-voice digital synthesizer which can be expanded up

# Omni Magazine called this keyboard



“the Philharmonic of the future.”

In its April 1982 issue, Omni Magazine wrote that Synergy is “a compact but powerful digital synthesizer, a computer controlled music maker of a thousand voices... capable of producing uncanny duplications of acoustical instruments, down to the scratch of a bow and the pluck of a string... lets a player modulate the volume of the music as a pianist does when he adds texture by either gently depressing or slamming down on the keyboard... play anywhere from 8 to 16 notes at the same time using four different voices... offers access to textures, timbres and colors that Beethoven couldn't even fantasize about”.

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# SYNERGY

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to 128 (!) voices. Its unique "partial timbre" method of synthesis allows realistic creation of standard instrumental, as well as other, sounds. A partial timbre consists of twenty-four separately adjustable harmonics, a harmonic envelope generator, a volume envelope generator, and adjustable vibrato and portamento rate as well as other special effects. There are as many partial timbres as there are voices (e.g., sixteen on a 16-voice instrument). Up to four separately adjustable partial timbres (ninety-six harmonics) can be triggered from just one key on the keyboard. As you can see, digital synthesizers afford an extraordinary amount of control. Oh yes, the Synclavier II also includes a 16-track digital memory recorder, which we can think of as the digital "equivalent" of a built-in 16-track tape recorder.

The Fairlight C.M.I. can output up to eight separate voices. It comes with a high resolution video graphic monitor (like a television screen), as do many of these very high-priced digital instruments. The user can diagram in great detail each envelope of any parameter of a given sound using a "light pen"—a pencil-like device which is held next to the screen and which can actually change the shape of the envelope. It's like an oscilloscope in reverse: the musician draws the waveform desired and the Fairlight C.M.I. produces the appropriate sound. Any acoustic sound can be input to this instrument through a microphone; the Fairlight's "waveform memory" instantly analyzes the sound and does a very credible job of reproducing it and allowing it to then be digitally controlled.

E-mu's Emulator also has the ability to digitally store and control any sound which has been input to it. While it has few of the other features of the Fairlight C.M.I., it is actually far less expensive than that instrument.

The Con Brio ADS 200 has sixty-four multi-waveform digital oscillators, 128 envelope generators (each of which has sixteen stages) and a video screen that presents a visual representation of individual envelopes that change in real time as the musician changes the sound. Its 8-inch floppy disc allows the storage of any number of fully polyphonic tracks, up to four of which may be played back simultaneously.

Digital Keyboards' General Development System (GDS) has thirty-two digital oscillators, up to sixteen of which may be used in the creation of each

voice; it outputs a maximum of eight voices. Its digital memory is eight channels. "Timbral interpolation" is one of the interesting concepts used by the GDS; the unit can interpolate a variety of timbres within a single voice. The timbre heard depends upon how hard the velocity-sensitive keyboard is struck. Rather than specifying frequency and amplitude envelopes as single curves, they are defined as "regions" limited by "upper-bound" and "lower-bound" envelopes. When a key is struck, values are selected between the two boundaries proportionate to the key depression.



Digital Keyboards has taken another approach to digital synthesis, as has Yamaha. The GDS Synergy and Yamaha GS-1 and GS-2 are pre-set digital synthesizers whose entire programs can be easily changed by the user. The Synergy can accept twenty-four factory programs simultaneously; the GS-series accepts sixteen such programs. The user has little control over these programs, but by inserting a different cartridge or magnetic card, an entirely new set of programs becomes available to the user. This approach allows the realistic sound of digital synthesis at a more reasonable price, while sacrificing programming flexibility.

E-mu's Audity offers complete computer control of sixteen totally separate analog synthesizers. Each of these synthesizers contains two VCOs, voltage-controlled low and high pass filters as well as a multimode resonant filter, four ADSR envelope generators, noise source, LFO and four independent modulation paths. Because the Audity's computer controls each synthesizer separately, it is capable of producing sixteen completely different voices in real time. The Audity also has a 16-channel polyphonic sequencer and keyboard.

Like the Audity, Buchla's Touche combines both analog and digital circuitry. Its twenty-four digital oscillators are combined into eight voices that are playable in a variety of polyphonic, split keyboard and multi-instrument modes. Additionally, the Touche contains a specialized processor that directs the progress of sixty-four acoustic parameters, each with a time resolution of 1/1000 second. Up to thirty-two labeled instrument definitions are instantly accessible, with additional definitions being stored on tape for subsequent retrieval.

Finally, the Prism from Kinetic Sound Corporation offers still more high technology, including the ability to have as many as five musicians playing remote keyboards simultaneously, all controlled by the main console which is being played by a sixth musician.

There are two main points to consider if you're thinking of buying a synthesizer: your pocketbook and your needs. The synthesizers mentioned in this two-part article vary in price from under \$200 (the Electro-Harmonix Mini-Synthesizer) to \$69,000 (the E-mu Audity). However, almost all synthesizers have an inflated list price which allows the dealer to sell to you at a "discount." Take advantage of this and don't expect to pay the retail price for a synthesizer. Discounts of up to 25% or even more are not uncommon, depending on how desirable and available the synthesizer you want may be. Just to confuse things, a very few manufacturers really mean what they say, and the list price is the selling price. As Smokey Robinson used to say, you better shop around.

Consider your needs very carefully, because there's no reason to pay for features you won't use. If you're a gigging musician who is not into learning programming, one of the preset polyphonics may be for you. If you have a home studio and no time limitations, consider the flexibility of a modular or quasi-modular system. If you're not a keyboardist, why pay for a keyboard? If you're mainly interested in playing hot lead lines you may not need polyphony. There is certainly a wide variety of synthesizers and, given proper thought, you can find the one that best suits your needs. Good luck and have fun.

## REFERENCES

<sup>1</sup> Information from Syntauri, Ltd., 3506 Waverly Street, Palo Alto, CA 94306; Mountain Hardware, 300 Harvey West Blvd., Santa Cruz, CA 95060; American Micro Products, Inc., 705 North Bowser, MS 107, Richardson, TX 75080; Alf Music Products, 1448 Estes, Denver, CO 80215; and Passport Designs, 785 Main Street, Suite E, Half Moon Bay, CA 94019.

<sup>2</sup> Information from Software Affair, 473 Sapena Ct., #1, Santa Clara, CA 95051; and Newtech Computer Systems, Inc., 230 Clinton Street, Brooklyn, NY 11201.

<sup>3</sup> Information from Electronic Music Systems, 45 Livingston Road, Suite 501, West Hill, Ontario, Canada M1E 1K8; See also Grockett, "Pet's Built-In Synthesizer," *Polyphony*, May/June 1979, p. 10.

## SYNTHESIZER MANUFACTURERS

Aries Music, Inc.  
c/o RMS  
48 Brighton Avenue  
Boston, MA 02184

Buchla  
P.O. Box 5051  
Berkeley, CA 94705

Conbrio  
975 San Pasqual, #310  
Pasadena, CA 91106

Digital Keyboards, Inc.  
105 Fifth Avenue  
Garden City Park, NY 11040

EML, Inc.  
P.O. Box H  
Vernon, CN 06066

E-mu Systems  
417 Broadway  
Santa Cruz, CA 95060

Gleeman Instrument Co.  
97 Eldora Drive  
Mountain View, CA 94041

HEAR  
1122 University Avenue  
Berkeley, CA 94702

Korg/Unicord  
75 Frost Street  
Westbury, NY 11590

New England Digital Corp.  
(Synclavier)  
P.O. Box 305  
Norwich, VT 05055

Octave-Plateau  
928 Broadway  
New York, NY 10010

Polyfusion  
160 Sugg Road  
Buffalo, NY 14225

Roland Corp.  
2401 Saybrook  
Los Angeles, CA 90040

Serge-Modular Music  
572 Haight Street  
San Francisco, CA 94117

Star Instruments  
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Stafford Springs, CN 06076

Strider Systems, Inc.  
P.O. Box 2934  
Norman, OK 73070

Three Sixty Systems  
18730 Oxnard Street, #215  
Tarzana, CA 91356

Wavemakers  
P.O. Box 27  
Edmones, Wa. 98020

Arp Instruments, Inc.—c/o MDS  
4710 W. Fullerton Ave  
Chicago, Ill. 60639

Computone, Inc.  
P.O. Box 433  
Norwell, MA 02061

Crumar  
105 Fifth Avenue  
Garden City Park, NY 11040

Electro-Harmonix  
27 West 23rd Street  
New York, NY 10010

EMS  
460 West Street  
Amherst, MA 01002

Fairlight C.M.I.  
c/o Bruce Jackson  
P.O. Box 401  
Lititz, PA 17543

Gray Laboratories  
1024 Lancer  
San Jose, CA 95129

Kinetic Sound Corp.  
11 Maryknoll Drive  
Lockport, Ill. 60441

Moog Music, Inc.  
2500 Walden Ave.  
Buffalo, N.Y. 14225

Oberheim Electronics  
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Santa Monica, CA 90401

PAIA  
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Oklahoma City, OK 73116

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# recording with Stevie Nicks

I did the album because I wanted to make sure I still could do something for myself," says Stevie Nicks about her debut solo album, *Bella Donna*. Nicks, Fleetwood Mac's raspy-voiced female singer, has had her share of the pressure as a member of one of rock's premier groups. Consequently, her songs had reflected the frustrations and disappointments in her life. But apart from her Mac ties, Nicks has discovered a new-found happiness in her song. Gone are the days of struggling to make ends meet, of self-doubt, of touring until she was too tired to sing. She will not abandon the group, but instead will continue to further a new and more satisfying avenue of expression as a solo performer.

Best known for her hit Mac songs, "Rhiannon," "Dreams" and "Sara," Nicks left the mechanical wizardry of Fleetwood Mac behind her for a refreshing blend of rock, pop and country. Under the guided direction of Frontline Management and producer Jimmy Iovine, Nicks' album reached number one on the record charts only a few weeks after its summer release. Two duets from the album, "Stop Draggin' My Heart Around" with Tom Petty and "Leather and Lace"

By Stan Hyman & Vicki Greenleaf

EBD/82

with Don Henley, also cracked the top-10 on the singles chart.


With the assistance of Petty and Eagles Henley and Don Felder, drummer extraordinaire Russ Kunkel, pianist Roy Bittan and guitarist Waddy Wachtel, Bella Donna has already gone platinum. After finishing work on Mac's forthcoming LP, Nicks is completing a Home Box Office special scheduled for a March air date. Relaxing in her manager's California office, she reflected on her career.

**Modern Recording & Music:** Did the success of *Bella Donna* satisfy your expectations toward a solo career?

**Stevie Nicks:** I'm really kind of stunned. I never let myself believe that the best thing is going to happen. I just sort of let myself be very surprised if it does...but I don't expect it. So I didn't expect anything from *Bella Donna*. I just did the best I could and finished it. I had a wonderful time doing it. It was over in two and one-half months, like a flash. I didn't expect it to be the greatest record in the world or not the greatest. I just expected it to be what I could do. The success that it [the album] seems to be having is like *Bella Donna* is on her own. She's flying out of the record stores without me. She's kind of gone. And it seems to be very much out of my hands. There's nothing I can do to change it now. It's out and I'm having to get used to the fact that it isn't just mine anymore.

**MR&M:** That statement is somewhat confusing. Are you saying you wish that the album wouldn't have been so successful and that your songs would've remained basically unknown?

**SN:** All those songs I did over a long period of time. They're now out in the world and everybody's hearing songs that I've been listening to for five, six, seven years. Don't misunderstand me. It's not that I'm not happy about this. I am. I'm just sort of adjusting to it slowly. It bothers me a little bit just because it [the songs] has been part of me and it has been very private. But to get people to listen, you have to put it out there and explain a little of it. And it's nerve-racking and difficult sometimes. I think people wonder why I'm not seriously jumping up and down. It's because I'm not sure how to deal with it. I've never really been alone before doing something. I've never had no one else to fall on. I've never had to do all the interviews myself. I could get crazy about it. The excitement is so strong that...it just makes me nervous.



**"When Fleetwood Mac records,  
it's very technical..piece-mealed.**

**I like recording 'live'..."**

**MR&M:** You seem to imply that there is an emotional strain working apart from Fleetwood Mac.

**SN:** Yes, but at the same time it makes you feel more independent. I am more independent now. I did the album because I wanted to make sure that I could still do something for myself.

**MR&M:** Will it be hard to go back and work with the group now that you've cut an album on your own?

**SN:** It will only be difficult in that I'll get to do three songs instead of ten and I'll be working less time. It's not enough for me. That's the problem. I write so much that I just get terribly backlogged all the time. And for me to work on an album that takes a long time—like a Fleetwood Mac album—and then have only three songs on it is frustrating. I don't spend too much time working. I sort of spend a lot of time sitting. I spent no time sitting on *Bella Donna*. I mean I was on my feet the whole time. It's going to be hard for me to sit, because [in that situation] I'm not one of the players, and that puts me on the other side of the glass alone, with them out in the studio. It's very lonely.

**MR&M:** What was the motivation behind cutting *Bella Donna*?

**SN:** I never shared any of my material until now, and I'm 33 years old. I figured I have those songs and many, many more that you haven't heard. And I felt that people should hear them. The reason I write songs to people is because I think I might be able to take them away for a minute and make them feel better, or give them a little piece of philosophy that might help them at that moment. I care so much about my songs and it's sad to see them never played. I don't mind sharing my songs with people. I mind a little bit sharing me all the time because that's a lot. My songs—which are a personal diary of my life—doing interviews, talking about my songs...it's a lot for two little shoulders to hold up.

**MR&M:** How did you come to choose the songs for *Bella Donna*?

**SN:** "After the Glitter Fades" was written in 1972, nearly two years before Fleetwood Mac. I thought that was a really good place to start. It described how I felt before I was famous and before I was rich. I was very much aware of the glitter that didn't hold up for very long and how quickly it faded. I guess I must have had a real good idea of what was coming. Somewhere in my mind I knew there was going to be some serious things that would happen in the next several years. And it was going to be due to the glitter in Hollywood somehow. I ended the album with "Edge of Seventeen" which is the last song I wrote, around when John Lennon died. It seemed to be a good place to end it. What went in between really wasn't planned. We recorded it in six days. A couple of songs had to wait for the next album.

**MR&M:** How did the two duets ["Leather and Lace" with Don Henley; "Stop Draggin' My Heart Around" with Tom Petty] come about?

**SN:** I just love singing with people and they know it. So when people call me up they know I'll come down 'cause I just love to sing duets. That's how the duets come about. I don't like to always sing by myself. I think it's much more fun to sing with someone else. "Leather and Lace" I wrote for Waylon Jennings and Jessi Colter who were going to do an album five years ago. Waylon had asked me to write a song called "Leather and Lace;" I spent a long time on it. I tried to give it a little bit of Waylon, a little bit of Jessi and a little bit of what I knew it was like to be in show business, what it was like to work with your husband or your old man. But they [Jennings and Colter] broke up and Waylon decided he was going to do it alone. But I said no because I had put a lot of time into the psychology of the song and felt it was a mistake to do it alone. It's really a wonderful song.



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So when *Bella Donna* came out, there was no reason for it not to be done just because Waylon and Jessi broke up. But I did want everyone to know I wrote the song for them. I didn't write it for myself.

**MR&M:** When did you originally decide to do the album?

**SN:** I decided to do *Bella Donna* when I came off the road with Fleetwood Mac at the end of the *Tusk* tour. I was in really terrible shape. I was so tired and sung out. I was so "Landslide"-ed out and so "Rhiannon"-ed out that I thought if I had to stand on stage for two and one-half hours and do that set one more time I'd go nuts. The idea to do a solo album came when I was going out with Paul Fishkin [co-owner of Modern Records] about two years ago. We just sat down one night and decided that it would really be wonderful to start a record company that really cared about the artists and had high morals and principles and was special. And he did it. He moved the ferris wheel and started Modern. It was very difficult for both of us. Everybody was angry at us. But we really felt that it was important that we go ahead and do it no matter what.

**MR&M:** Several of the songs on the album seem to have a country flavor to them. Is that a fair assessment?

**SN:** Yes. I had a "country" grandfather and I write a lot of country songs. But nobody knows it. When I give a song to Fleetwood Mac they kind of take it apart and put it back together. So if it was country, it's not country anymore. You wouldn't ever hear the country in it. I don't mind it, but if I really don't like it I tell them. I let a lot of songs be done in a way that I really wouldn't do them, but because it makes everybody else happy I go along. I figure it's not going to make my song any better to have them play it the way I want it and play it terribly. I'd rather have them play it the way they want it and play it really well.

**MR&M:** The melodies of some of the songs on the album are reminiscent of your past work. For instance, "Leather and Lace" has traces of "Landslide," while "How Still My Love" sounds similar to "Dreams."

**SN:** My songs are really just continuations of every song. I can sit down and play you a medley of "Dreams," "Sara," "Outside the Rain," "How Still My Love" and "Edge of Seventeen" and they're all little pieces [of each other]. Those are the only chords I know. I like all my melodies and the simplicity in which I write. So I really don't try to change that much. I don't sit around

saying, "Oh, that sounds too much like 'Dreams.' If I like it, I don't care if it sounds like 'Dreams' or not. I just try to make it better.

**MR&M:** The album became such a quick success. Do you have any idea who your audience is?

**SN:** I don't have any idea who's buying the album. I have no idea who my audience is or what they're like. I truly believe that the energy, the magic that surrounds a project like this is very important. It's as important as the music, as important as the songs.



**MR&M:** Where was *Bella Donna* recorded? Also, can you elaborate on the "magic" that you're talking about?

**SN:** When we made the album we rented [comedian] Bill Cosby's house. The girls [backup singers] and I lived there. Sometimes everybody else on the album stayed there. It was a huge house. We all had to learn to relate to each other. If you got angry at someone in the studio, you just realized that the person

was probably going to be around at the house, and you were going to have to deal with them. Therefore, you had to get unangry quickly. We created an atmosphere which *Bella Donna* came out of. It was like Snow White and the Seven Dwarfs: out to the car and off to work we'd go, off to work we'd come back. Sharon [Cerani], Lori [Perry] and I would sit down on the living room floor and practice in the afternoon before we'd go to the studio. Then we'd sing in the car with our tapes as we drove to the studio. My part was done in two and one-half months; six to eight songs, full vocals with a few overdubs here and there.

**MR&M:** But what about the actual recording of the album? What was that like?

**SN:** The album was cut like a "live" concert. We recorded "live"—the girls, the percussion, the drummer, everybody, all in one room. It was like a concert, it was very "live." I sang every single like we were seriously performing for somebody. Everything we did is on the track. They had to turn it all down to get the bleed [leakage] out and we beefed



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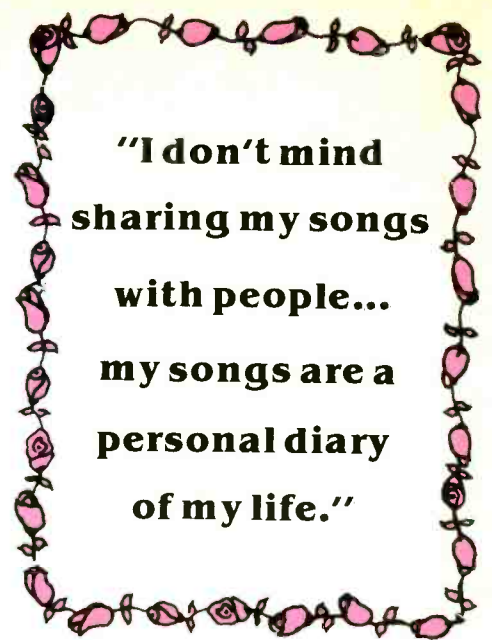
up the background vocals. There were almost no mistakes. "Highway Man" was cut three times. The second one is on the album. It was completely "live" with no overdubs on it. When Fleetwood Mac records it's very technical; it's very piece-mealed. They put things together and then put something else on it. Then they take it off and then they add something else. I don't know how to do that. I don't understand it. I loved recording "live" because it was really fun. It was like going to a party every night. Except it was a good party where nobody's drunk or stoned and everybody's having a good time. Everybody was very disciplined. Everybody in the room recording knew that we didn't have much time. I had to be in Paris [to work on Mac's latest LP] on May 1. We didn't start until the second week of February. If I wasn't done that was too bad. I had to go.

**MR&M:** How did you come to choose the backup artists for the album?

**SN:** Jimmy [Iovine, Nicks' producer] just picked out the perfect people. He let me work with the two women that I wanted to sing with. We'd be singing together for three and one-half years and were ready. We could sing every song a *capella* because we'd been practicing for so long. We would practice with the demos which is like practicing together. So even if Lori would be in Dallas and Sharon would be in Los Angeles and I'd be in New York, we'd be practicing to the same group of forty songs. I always wanted to do a thing with two girls where we would sing and be like a girls' Commodores. I wanted to have background vocals sound like they were answering back and forth. After a while Jimmy would say that we couldn't do this or that. He'd say, "Stevie, shut up and quit protecting them. Just back off and let me work with them." It was a constant learning process.

**MR&M:** From what you're saying, it seems that Iovine played a key factor in pulling the album together.

**SN:** Yes. He had an intense way of making us mad enough without making us angry or furious. By doing that he made you feel like, "OK, I'll show you." And he got the most incredible performances out of everybody. For instance, he was right in the middle of the room while we were recording "Edge of Seventeen." He had his earphones on and all of a sudden he turned the beat of the song around. He started looking up at [drummer] Russ Kunkel and motioning to him to change the tempo. And I'm watching Russ start to play what Jimmy's mo-



**"I don't mind  
sharing my songs  
with people...  
my songs are a  
personal diary  
of my life."**

tioning and I'm blown away. My eyes can't believe that they're seeing this little guy [Iovine], bouncing around the room looking like some kind of little elf, telling all these intense, famous guys what to do. And they're following his every move. It's incredible.

**MR&M:** From what you're saying, the chemistry seemed to be perfect.

**SN:** The right people in the right room together. Make Stevie happy. Let her have her two girlfriends sing along. Make her think she's on stage at the [L.A.] Forum. You have to look good with Russ, Waddy [Wachtel], Roy [Bitan] and Michael [Campbell] of the Heartbreakers. With Tom Petty, Don Henley and Don Felder out there you're certainly not going to stand up there and be terrible. You're going to do the very best you can from the first time you sing. Even the worst vocal is going to be great. Also, you're so proud, that you don't want to look like a jerk in front of all these guys!

**MR&M:** Any plans for another album?

**SN:** I feel very content because I got ten songs out. Now I don't have to worry about those anymore. Now I can go on to the next ten. I'd be recording all year 'round if I could. I wrote a song the night before last. I've written two songs in the last month. I have two from the album that didn't make it because there wasn't enough room. I have three or four old ones I still want to do. That's not counting the songs that I'll write in the next couple of months. But as long as I know I can every once in a while go in and knock out ten songs, I won't be a nervous wreck. That little bit of an outlet makes it okay.

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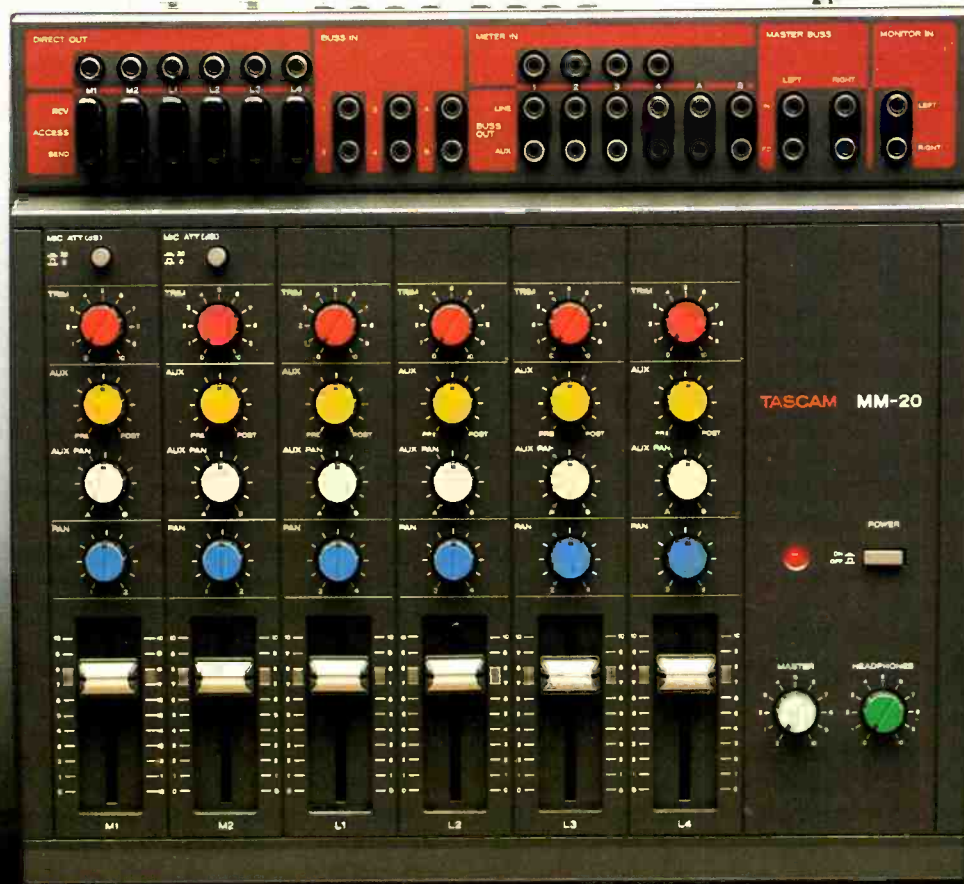


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## TASCAM MM20 Recording Mixer.

# Studio Notebook #7

By James F. Rupert

**N**ow that we've explored the possibilities of equipment available to you and the process of bid solicitation from suppliers, let's take a relaxed couple of pages to discuss the reasoning behind your choices in studio gear. We've briefly touched on the subject of positioning in the marketplace previously, but it's time to consider how the position you choose for yourself will determine the choice of equipment needed to fulfill the needs of the consumer you're shooting for.

Many of the necessary decisions to be made for your new business may already have been made for you by your own circumstances. If you work a day job and only want to keep your studio open part time in your off hours, there is no sense in trying to draw business from advertising agencies. Ad agencies generally need their product quickly, efficiently and, oftentimes, at the last minute. If your business hours are not going to sync with theirs, then be prepared to wave a fond farewell as they sail away to sunnier shores. If your studio is in your basement, and has a ceiling clearance of 7½ feet, then don't plan on trying to sell your local philharmonic orchestra on the idea of recording in a 300 square foot room. On the other hand, if you have a beautiful new twenty-four track 40,000 cubic foot facility, you probably won't be inviting in many garage combos that only have \$38.50 to spend on a recording of themselves. All these are determining factors as to whom you should or should not be setting your sights on. The first two examples show how your limitations should be considered in your marketing plan, the last example how your potential should not be wasted.

As stated in "Studio Notebook #3," [See October 1981 issue] all positioning is in reality recognizing a need and a desire for a product or service in the marketplace and then going about trying to fill that need. You cannot depend on begging, borrowing and stealing the clientele of your competition and hope to stay in business for very long. Your competition didn't get where they are without doing something right. Learn from that and find the markets they may be missing.

Advertising and image are subjects we'll be covering in later installments. Right now our concern is how your market position determines the equipment you will be purchasing for your studio. If you decide there are untapped bucks in the music business of your area, then most probably it's time to think multi-track machine. But what kind of multi-track machine? Will a four-channel unit do the trick for the work you'll be doing, or should you be digging into those pockets a little

deeper for an eight track? Maybe shoot the wad and go for sixteen? You've even considered twenty-four, you say? Did somebody mention digital?

But wait a minute, there aren't that many bands around with that kind of money, are there? Better just make it sixteen. Money still tight? Eight tracks will do just fine, maybe. Of course you could do some ping-ponging and get by with four...

See the problem? Nobody wants to overspend, but nobody wants to be left out in the cold, either. Without looking seriously and analytically at the type of business you plan on catering to, you cannot make an intelligent decision on what to buy. Only an idiot buys extra gear just because the guy down the block has it. (I oughta know, I've done it plenty of times!) Poorer schmucks yet sit on thousands of dollars worth of stuff that collects dust on the on/off switch. The saddest fools of all are those competition proves they can do his job not only for cheaper rates but with less investment out of their pockets.

How about starting by looking hard at yourself as a businessman and as an engineer. Can you deliver top quality products faster than your competition? (If so, the ad agencies will love and worship you.) Do you have a specialty that qualifies you for difficult production work the competition tries to avoid stumbling over? (Audio/visual production? Slide/tape show tone pulsing?) How about special accessories or aids? (Production Music library? Electronic pulse tone generator? Sound Effects Library?) Specialized Facilities? (Over-sized studio? Remote recording van?)

Perhaps the physical characteristics of your studio space might present options to you that might not have been realized. A tiny home studio could possibly make an excellent narration overdubbing facility for radio commercial work. If you are fortunate enough that the studio space you have been able to procure is fairly huge, are you thinking of one monster studio or several smaller well tuned and sealed rooms for multiple client work? If you've got the bucks for high class and big ticket recording gear, then one gargantuan room might bring 'em in from far and wide. Several smaller studios might bring less rent for each room, but being able to run three or four rooms full-tilt boogie simultaneously could add up to more screaming eagles per hour in your bank book. One room could be two-track for narration, voice-over and production; another for eight- or sixteen-track full music and jingle recording; another yet for four-channel budget multi-track work, and so

on. This method of space division obviously requires more dollars, strict control of separation and sound leakage and longer, costlier construction problems. Yet it might be a viable alternative for some of you who've been wondering what to do with some of that extra space you've got screaming, "Use me, use me."

One idea currently being implemented by at least one firm is a series of small studios, in a single large building, that the customers run themselves. Each room features a small mixer and four-channel "syncable" cassette deck with microphones, monitors, a delay unit, a piano and a few other basics. After a brief orientation as to how the equipment works together, the customer is left alone in the room to make his own recordings. The entire studio complex is consequently run by relatively few people and the customer gets a substantially lower price on recording time than he would have if he had gone across town and used a full studio and engineer. More importantly to some customers, they get the chance to learn more about recording their own material through hands-on experience at a price that's readily affordable. [For more information on this studio format contact: Creative Space, 135 N. Parkview Street, Los Angeles, Ca. 90026.]

Most of us will be dealing with one room that will be as multipurpose as is humanly possible. This means equipment that can be used for more than one purpose. Your half-track stereo deck may work great for mixdown from multi-track tapes, but will one of the

channels sync up with the other for audio/visual tone pulsing or matching up the music soundtrack on one track with the narration on the other? When you switch from working on radio spots to laying down tracks for your cousin Melvin's polka band, do you have to repatch all the connector cords between the console and the recorder? Is your equipment portable enough to pull out and load up quickly enough for a remote recording job?

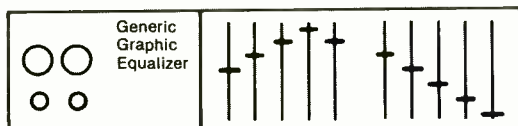
If you already have your basic studio equipment set-up, the answers to these questions are evident. If you are only in the process of making out your list, you can see why the selections you make should conform to the demands placed upon them by the type of work that you plan on concentrating on.

The potential of both your equipment and yourself is what goes into the image that you will be projecting to the public. Part of it will be through your advertising and promotion; part of it will be through your client's impressions of you, your studio and how you both work together. Improperly chosen recording gear is not only expensive in terms of wasted dollars, it also can cut deeply into your future profits through lost customers who have found—to their frustration and anger—that you cannot deliver the goods you've promised. Buying right the first time is admittedly a difficult and scary art, but it can be done. Yet not, however, without knowing the application to which the equipment will be put. See you soon.

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**Profile:**

**THE**

**TUBES**



**by Jeff Tamarkin**

Since the early 70s, the Tubes have been stretching the boundaries of rock as far as they would go. Combining satirical rock with theatre, art and technology, the Tubes have always managed to stay a few steps ahead of the rock mainstream. Even their most ardent fans are constantly amazed at their seemingly endless supply of polished, experimental and often hilarious musical ideas. Last year, the group moved ahead again, on its first album for Capitol Records, *The Completion Backward Principle*.

The Tubes nucleus was, in the mid-60s in Phoenix, Arizona, where the various Tubes-to-be floated from one local band to the next, playing cowboy bars and other local haunts. When the musicians found themselves relocated in San Francisco at the beginning of the 70s, they pooled their resources, began writing

songs which were somewhat outrageous compared to anything else in the then-hippie-dominated San Francisco scene, and set out to make an impression. It didn't take long.

Utilizing outlandish props, costumes and special effects, the Tubes quickly became one of the biggest attractions on the West Coast, and with their anthem, "White Punks On Dope," the group catapulted to national success.

Having gone through several artistic metamorphoses, in 1982 the Tubes found themselves with a new record label and one of their most impressive LPs ever. While in New York, Tubes keyboardist Vince Welnick and guitarist Roger Steen met with Modern Recording & Music's Jeff Tamarkin to discuss their history and their approach to both recording and "live" performance.

**Modern Recording & Music:** The Tubes originated in Phoenix, Arizona. How did the group come together?

**Roger Steen:** We were in different bands and we knew each other from playing the same clubs. There were only three or four clubs to play.

**MR&M:** Why did you relocate to San Francisco?

**RS:** Some of the guys were going to school there.

**Vince Welnick:** There were two bands originally: one with Roger, Fee [Waybill], Prairie [Prince] and Mike [Cotten]; then one with me, Bill [Spooner],

Rick [Anderson] and another drummer. When we eventually both moved to San Francisco, they lost their bass player, and they invited Rick, Bill and me to play with them.

**MR&M:** The lineup of the Tubes has remained intact since the beginning. How has the group managed to stay together so long? Other groups have trouble lasting a few years.

**RS:** I think it stems from our growing up together; we're very similar in our backgrounds. A lot of groups come together with members from different areas, and they're basically different

people. That might make it good for awhile musically, but that can change after some time.

**MR&M:** What inspired the members of the Tubes to play music?

**RS:** I think it was radio...for me, anyway.

**MR&M:** Was there anything about Phoenix itself that spawned your creative instincts?

**VW:** Actually, Phoenix is used as a test market—every kind of burger stand started out there, and every rock band came in and out of there. We've been fortunate enough to see all of the best





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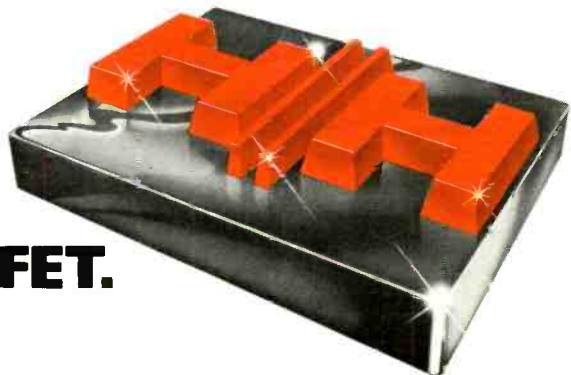


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bands, with the exception of the Beatles.

**MR&M:** At what point in the band's development did it start using theatrics and elaborate props and costuming?

**RS:** Even in the beginning we used light shows and dressed up in old, second-hand clothes.

**VW:** Prairie and Mike would spend two hours spray-painting us all before we even put on our clothes.

**MR&M:** What made the band go in that direction, especially in San Francisco during a time when everyone was coming on in their street clothes and avoiding theatrics?

**RS:** I guess it was because everyone else was doing that. We wanted to be different.

**MR&M:** Did you have a theatre or art background, which might have steered you toward combining those elements with your music?

**VW:** The original intention was just to make it a party, to amuse the audience and ourselves, rather than standing out there in Levis. From meeting people like Kenny Ortega, our choreographer, we learned how to turn it into theatre, but first it was just to outrage. It was a gimmick, but it was funny.

**RS:** We'd played a lot of shows around the Bay area during which we played it pretty straight. At the time, Fee wasn't really in the show yet, but he'd come out and do a couple of numbers as a character and people seemed to really go for that. So we'd come back the next week and add another number and he'd be somebody else.

**VW:** I really enjoy it myself. I saw the movie *Texas Chainsaw Massacre* and told Fee to see it...then we used a chainsaw and it was great; every time it went on I'd get a tingle. It gives you a lift instead of doing one thing for two hours.

**MR&M:** What inspired the band to write songs that took an anti-consumerism stand, that parodied the consumption habits of Americans?

**RS:** We're not really anti-consumerism; we're not really saying yes or no. We're just feeding it back. We don't ever want to say what you should or shouldn't do.

**VW:** We just reflect what's around us. "White Punks On Dope" was just a reflection of the people we hung around with in San Francisco, back then.

**MR&M:** What made the band choose San Francisco to work in?

**VW:** At the time it was just a good place to play, to launch your career from...and a good place to get food stamps easily.

**MR&M:** How did the Tubes fit into

the Bay area scene at that time? That's when bands such as the Grateful Dead and Jefferson Airplane were still going strong, and you were a totally opposite concept.

**RS:** People didn't really go for it right away.

**VW:** It wasn't until we went to L.A. that we began to headline our own tours in major facilities.

**RS:** Then we became sort of a mascot: the new blood of San Francisco. It became very hip to like the Tubes.

**MR&M:** Did it help alter the music scene there?

**VW:** No. It was always ruled by FM radio. We had a big cult following, but they're a different kind of people—hard to entertain—so it's hard to feel loved by a San Francisco audience. New York is tough, too. We always feel pressured in New York, inhibited. It's easier to go out and impress an audience that hasn't seen a group in maybe two months than it is in a place like New York.

when the *Remote Control* album was out, when the group decided to drop the theatrics and just stick to playing. But that was quickly abandoned. What happened?

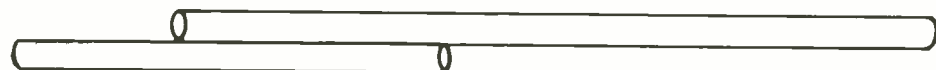
**RS:** I think it was more a case of Fee telling people that we dropped the theatrics than us actually doing it; if you look at that show, we had the TV and the smoke machines and almost as much as usual. We told people we weren't doing a show; it was stupid to say that because we were. We dropped the girl singers we'd had, but that's about it.

**VW:** It was just a lower budget show.

**RS:** It was basically a financial decision because we'd lost so much money adding people to the support. We couldn't do it again.

**MR&M:** How did the group hook up with Capitol Records after leaving A&M, a label you'd been with since the beginning?

**VW:** We'd finished an album I call *The Black Album*, and they didn't want to



**"It's easier to...impress an audience that hasn't seen a group in two months than it is in a place like New York."**



**MR&M:** How has recording changed for the Tubes over the years?

**RS:** The first time, I didn't have a clue what everything was: You sit out there and they sit up there and it all comes though here. We've all gained a bit of knowledge about the whole idea, and what it takes to get along in the studio: the relationship between producer and band, etc.

**MR&M:** Being such a visual group, has it been a problem for you to accurately capture the Tubes' music on vinyl?

**VW:** It is with seven pieces because if you're not careful you're gonna come up with a brown color, musically speaking; it'll all just mix together. One thing we've learned is when to play and when not to play—and when it doesn't really matter when you though it mattered.

**MR&M:** There was a period, around

spend any money on us at all. They didn't like the album and said they weren't going to release it, so we asked to be let go so we could release the album elsewhere. They said they'd let us go but that they'd keep the album and we couldn't record any of the songs for five years.

**RS:** That turned out for the better because Capitol scooped us up and they're promoting us in a way A&M never did.

**VW:** Capitol is helping us make artistic decisions as well. A&M gave us a lot of money, but never helped us get played on AM radio. They [Capitol] have people like Bobby Columby [former Blood, Sweat & Tears member] who sit us down and tell us how to make an FM song an AM song and help us find the right producer.

**MR&M:** You've had some interesting

producers. What was Todd Rundgren like to work with?

VW: He was great; a magnificent person, bordering on genius.

MR&M: David Foster produced your latest album, *The Completion Backward Principle*. How did you hook up with him?

VW: Through Capitol. They sent over some big-time producers, and we found David to be the best arranger.

MR&M: How did he guide the group as producer?

RS: We really listened to him; we liked everything he did. The best part was that he liked all the songs we'd been working on; everyone else would say, "Well, this one's not too good," or "Maybe we can use part of this one." But Foster said, "These songs are good; you've done a lot of work already; just thrown in a couple of chords here." He didn't change the songs much at all.

MR&M: Did you have demos ready to play for him?

VW: Only our 8-tracks. We have an 8-track studio. But finally, we decided that it took so long to make the 8-track demos we'd just play them all "live." We did, and he's a good music writer, so he'd write the songs out after a couple of times through, and then tell us things. For instance, some of our songs only had two parts—a bridge and a verse, or a verse and a chorus but no bridge—and he'd added that hidden element. His experience with Earth, Wind and Fire becomes apparent on the record.

MR&M: Did you record the album on 24 tracks?

RS: Yeah, 24. We tried to keep it in our minds that we weren't going to overdo it, and hopefully we didn't. It's so easy to do. We cut things out of the mix.

MR&M: When you record, do you already have the stage show visuals in mind or does that come later?

RS: This was probably the first album we did with nothing but the music in mind. We figured we could always put a show together.

MR&M: Is there a theme tying the songs on this album together?

VW: It's just a slice of Americana, something for everybody.

MR&M: What does the title of the album, *The Completion Backward Principle*, mean?

VW: For me it's just a way of positive thinking, where you envision your hopes and dreams, and see them as they've already come true, and then you take the steps backwards from there to achieve them. In this case, it was having a hit single, and becoming a corporation,



which gave us the idea of wearing gray suits on the album cover. That's a joke, but a lot of people think we walk around now in gray suits. It's just a part of the album, though; it's part of the success story we're trying to paint. The picture is a joke, but the principle isn't.

MR&M: How do the Tubes structure the recording process?

RS: First we just do the basic tracks with about three instruments. We try to keep the basic bass and drums and scratch guitar parts, or keyboards.

VW: The main thing is to get the Prairie Prince drum sound down right off the bat. He's incredible, because he remembers all the fills that he'll have to put in throughout the song. He's the one guy who can't be punched in.

RS: We used reverb on the drums for the first time with this album; we usually keep them pretty flat. Other than that, we use a lot of mics; mics on everything.

VW: Each drum will have to be EQ'd or limited or have a noise gate put on it or taped up, but a lot of his sound comes from the way Prairie tunes his drums. He can play scales on his drums and he can even change the tuning if it's in a different key.

MR&M: Any other special techniques used with the other instruments?

VW: My keyboards are easy because it's all direct. My new policy is that if it takes more than 20 minutes to get the sound, then go for another instrument. Our engineer, Humberto Gatica, pulled out this special microphone for the grand piano: a \$2,000 German microphone. We also used that on all the background vocals. He works with David Foster; he knows how to get the sound—

if you can describe it he can get it.

MR&M: Would you run through the equipment used on this album?

VW: I sing through a [Shure SM] 57. I use a [Yamaha] CP 80 with an MXR flanger, and I use an [ARP] String Ensemble, a [Hohner] D6 clavinet and a Fender Rhodes with a Boss Chorus. Those are the only effects I use. Fee sang through Humberto's secret weapon, that tiny microphone.

MR&M: What about guitars and basses?

RS: Most of the guitar was my old '57 Strat. It's got EMG pickups on it. We used a Twin Reverb amp with a six-position tone setting. We used my Mesa Boogie amps and I used MXR Chorus, MXR distortion and MXR compressor pedals, and we used Eventide Harmonizers™. Bill used a Yamaha Super-Combinator and my Strat.

VW: Michael used my equipment mostly, but he's got a Wasp and a [Octave Electronics] Kitten and an Oberheim, a Roland Space Echo, a Doctor Rhythm, an Arp 2600 with modifications built in, sequencers and every effect imaginable.

RS: The bass was a Yamaha bass. Onstage he uses a Fender bass.

VW: Michael and I go directly to the P.A. onstage. We have a headphone mix which is slightly separate from the monitor mix.

MR&M: Drums?

VW: Yamaha.

MR&M: What innovations were utilized on the last tour?

VW: This was the first tour that we played every song from our new album. We've also completed a one-hour video tape based on the album, but expanded upon. It was shown as an opening act in clubs as well as on cable TV.

# Ambient Sound

By Len Feldman

## "No Noise" Is Good News

Despite the promise of digital audio discs and tapes (which has been discussed on more than one occasion in this column and in just about every other publication devoted to audio subjects), some manufacturers continue to make progress in the field of noise reduction in the world of analog audio. A few months ago, I suggested that CBS's CX system had been given a bad rap. Considering all of the major and minor critics who had been bad-mouthing CX, I expected to be bombarded with letters expressing a view opposite to mine. For some strange reason, that didn't happen. Could it be that most of the critics hadn't even *heard* CX properly demonstrated when they voiced their objections to it? That's what Robert Jamieson, Vice President of Marketing and Creative Services, CBS Records Group suggested when I stopped up at his office in the "black rock" (the affectionate name given by CBS employees to the monolithic looking structure of that color in mid-Manhattan which serves as CBS headquarters).

Bob Jamieson has recently taken on the responsibility of Project Coordinator for CBS's involvement in CX and he will serve as liaison with the CBS Technology Center (where the CX system was developed), CBS Recording Studios and the Columbia, Epic, Portrait, Associated and Masterworks labels in coordinating the flow of CX encoded product and the signing of new hardware and software licenses around the world. He intends to work closely with recording studios, engineers, producers, artists and record labels in encouraging and maximizing the release of CX recordings.

While Jamieson, ever the marketer, wasn't too anxious to talk about early technical flaws in the CX system, Louis Abbagnaro, the Director of Sound Reproduction Technology at the CBS Technology Center in Stamford, Connecticut, who also attended the meeting, was quick to admit that modifications had been made to the original CX scheme which alleviated the problems that some auditors had heard when reproducing certain kinds

of program material. Leave it to the technical types to "fess up" when they've made a mistake, but have managed to find a "cure" before it's too late!

One of Jamieson's projects is a newsletter, called *CX Update*, the first issue of which was circulated in early February of this year. From that newsletter I learned that CBS is preparing a CX demonstration disc which will represent a cross-section of musical styles. The album (probably released by the time you read this) will be available to retailers at a unit cost of \$1.25 F.O.B. through CBS Records, in Terre Haute, Indiana, and if you *still* haven't heard a good demo of CX, you owe it to yourself to listen to this sampler.

Helping to solve the "chicken and egg" dilemma of a system such as CX, Toshiba showed a pair of low-cost stereo receivers at the Winter CE Show in Las Vegas which incorporated CX decode circuitry. It should also be noted that Universal Pioneer's latest laser optical video disc player incorporates CX circuitry for the audio tracks and that Universal Pioneer and DiscoVision Associates (whom Pioneer recently took over) plan to release many of the laser video discs with CX encoding. RCA SelectaVision has also adopted the CX system in upcoming CED-format stereo videodisc players and software, where it should certainly help the signal-to-noise situation which has been nothing to rave about without such noise reduction techniques.

## Dbx Moves Ahead Too

Meanwhile, the folks at dbx have proudly announced an important breakthrough in their noise reduction system hardware. A new integrated circuit, developed jointly by dbx and Matsushita Electric Industrial Co., can operate on as little as 1.8 volts, making it possible to incorporate dbx noise reduction in portable cassette units. In addition to its low voltage requirements, the new chip, called an "NRX Chip," because of its low cost and small size, will have an impact on the car stereo as

well as the personal portable market, enabling that type of equipment to provide wide dynamic range and inaudible noise levels. David Blackmer, president of dbx, maintains that the immediate impact will be felt in these two markets because it will enable the many thousands of people who now record with the dbx system at home to play their cassettes on car stereo systems and in personal portables, such as the "Walkman" and other such products. The extremely small size of the chip and its associated circuitry makes possible the use of dbx noise reduction for microcassettes as well. Dbx believes that this development will pave the way for an explosion in sales of these and other audio and video products. According to dbx, there are now approximately 200,000 units in the field with dbx noise reduction capability internationally. The company expects that there will be more than one million units in use in 1983. These include dbx's own outboard noise reduction systems and decoders as well as home cassette recorders and car cassette players manufactured by leading audio equipment manufacturers which incorporate the dbx system. And, of course, many of the dbx units in the field have the capability to decode dbx-encoded records as well as tapes, since the principles involved in dbx disc decoding are virtually identical to those involved in tape decoding (equalization parameters differ slightly, but the 2:1/1:2 companding approach plus the true r.m.s. level sensing scheme is the same in both circuits).

#### Meanwhile, Back At Dolby Labs...

Having been introduced barely two years ago, it is truly amazing to see how quickly Dolby C-type noise reduction has gained acceptance domestically and internationally. Within months of its official introduction, equipment incorporating the new Dolby C companding circuitry appeared from nearly every Dolby licensee. Clearly, the promise of an extra 10 dB of noise reduction (over and above Dolby B) had a lot to do with the instant success of the system. But let's not overlook the fact that Dolby Labs knows how to merchandise a good idea to its licensees as well. The lab supplies a wealth of technical information to its licensees, charges a very minimal licensing fee or royalty per unit, and, in the case of Dolby C, charges no more than for Dolby B. Since incorporation of Dolby C also leaves room for a Dolby B switch position (and thereby does not obsolete user's older tapes when a new machine is purchased) why *wouldn't* every Dolby licensee incorporate the new noise reduction system into their more expensive tape deck products, where the added cost doesn't impose an inordinately great jump in price for the product. And, of course, Dolby C is an effective noise reduction system that offers benefits far greater than those offered by Dolby B. We can argue all day about whether Dolby was "forced" to produce a new system because of inroads made by dbx, Hi-Com, Super-ANRS, ADRES, Super-D (to name a few of the many noise reduction systems that have been cropping up here and overseas), but regardless of the motives, Dolby has once again gained world recognition and Dolby C will

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**“New work being done  
in the field of  
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if anything,  
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program source.”**

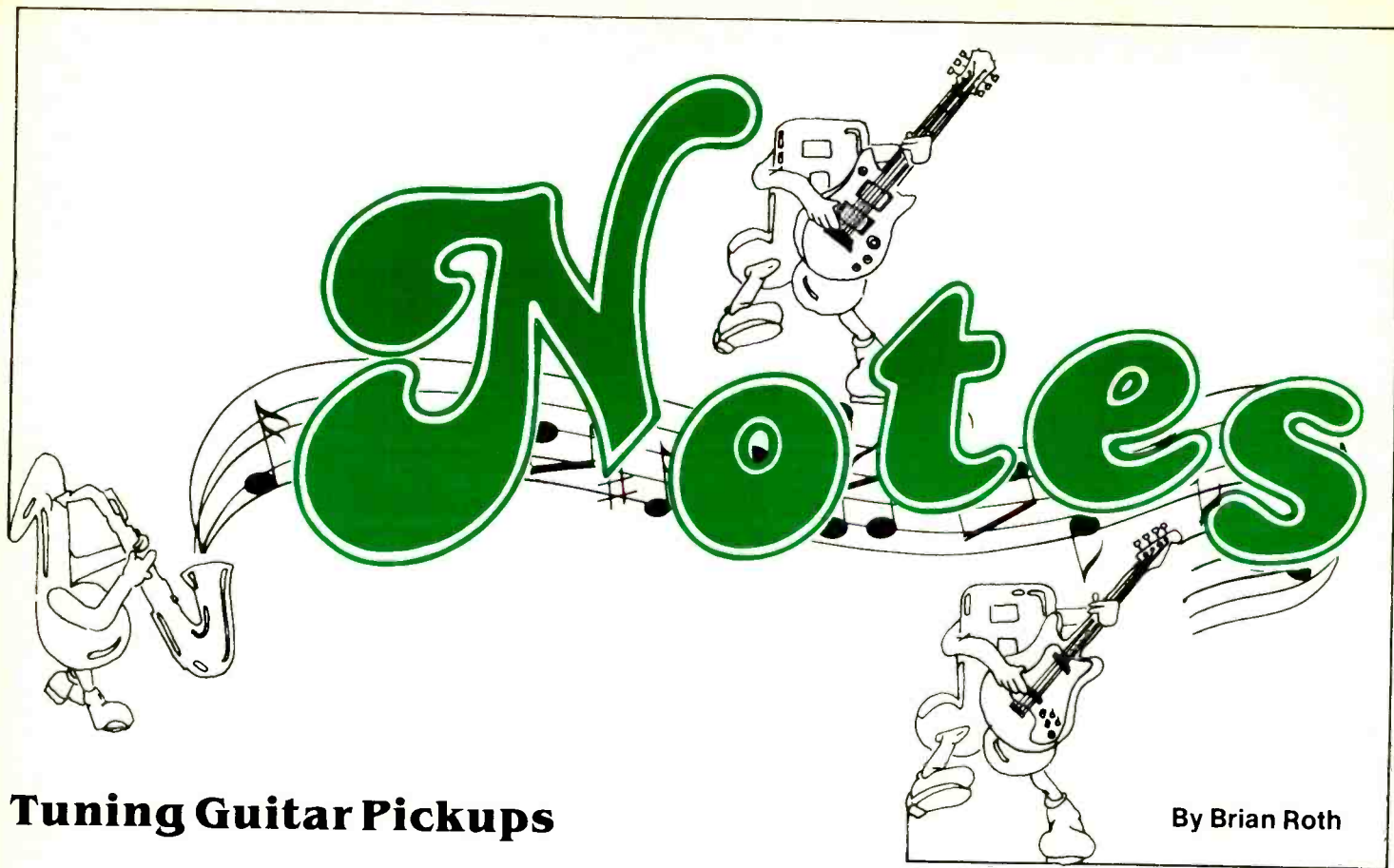
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soon be considered as much of a "standard" as Dolby B was in the preceding decade.

It is interesting to note, too, that while there are some who accuse CBS of introducing CX so as to delay the "coming" of digital audio discs, no one has ever accused dbx or Dolby of the same thing with respect to the coming of digital audio tape decks. Dbx, in fact, makes the point over and over again that the combination of a digital master tape *plus* their dbx encoded discs made from such a master tape, can give us today (in the pre-digital disc era) the kind of dynamic range that we will ultimately achieve with future digital discs. CBS, of course, has tried to say the same thing, with the important addition of offering a certain degree of listenability to their CX discs even if decoders are not employed. CBS, it should be noted, never used the word compatibility. That is to say, they never claimed that a CX encoded disc, played without a decoder, would sound *exactly* like the same music recorded on a conventional disc. All they ever said was that such a disc would produce satisfactory sound, with no obvious compression. And anyone who has heard a CX disc played on decent equipment will have to agree that that claim is completely met.

The fact that so much new work is being done in the field of noise reduction only emphasizes the importance of dynamic range in the reproduction of music and, rather than postponing the ultimate sound of digital audio, makes more people aware of what's needed and, if anything, hastens the arrival of digital audio as a consumer program source. Those of us who have had the pleasure of working with digital audio on the professional level know only too well that *nothing* is going to keep this superior form of music reproduction from reaching the public, sooner or later.





## Tuning Guitar Pickups

By Brian Roth

Some previous "Notes" columns have dealt with "hot rod" pickups and active electronics systems for electric guitars. In retrospect, I may have been putting the cart before the horse because many musicians seem confused about how pickups actually work. So, this month I will backtrack and attempt to explain the workings of pickups and how they interact with the guitar.



First, a brief review of the basic properties of magnets is in order—just in case you ditched Miss Ratchet's science class. In *Figure 1* I have drawn a two-dimensional representation of the "field" that surrounds a bar magnet. Keep in mind that this magnetic field is actually in three dimensions, and thus completely surrounds the length of the magnet.

So, we now have a thick chunk of metal that has the ability to hold your shopping list to the door of the 'fridge; not much good for a guitar pickup, however.

Years back, a clever scientist noticed that as a magnet was moved through the center of a coil of wire, an electrical voltage appeared across the two ends of the coil's wire. This voltage would be present *only* as the magnet moved and no voltage would be observed when the magnet was stationary.

However, the scientist noticed that as a ferrous (containing iron) material was moved into the field of the stationary magnet, a voltage would appear across the coil's terminals. If the ferrous metal was vibrated ten times per second in the magnetic field, then ten voltage impulses per second would appear across the coil's output wires. It is this characteristic

that forms the basis for all magnetic guitar pickups. As the guitar string vibrates within the magnetic field of the pickup, the coil produces a small electrical signal that corresponds to the pitch of the plucked string.

While every pickup works on this same principle, there are more variations of the theme than Carter's has little liver pills.

For instance, there are two kinds of materials used for the magnet itself. The most common is a metal alloy called Alinco. Due to increasing costs and scarcity of the raw elements required to make Alinco, many manufacturers are switching over to ceramic magnets. This newer type of material is not only cheaper to make, it also is capable of a much more intense magnetic field. Basically speaking, that means a given pickup coil design can produce a much stronger output signal if a stronger ceramic magnet is substituted for an Alinco magnet. This is the basis for several pickup "hot rodding" kits; the stock Alinco magnet is replaced by a ceramic.

Another factor that affects the performance of a pickup is the coil itself. The more wraps of wire surrounding the magnet, the stronger the output signal makes a good rule of thumb. However, you can't get something for nothing, and the penalty for having a coil with ten jillion wraps is increased output impedance. A high impedance circuit is more susceptible to outside electrical interference, and treble loss caused by the guitar cord will be more pronounced.

Next on the list of performance factors is the actual mechanical design of the pickup's components. This probably contributes more to the particular sound of a pickup than any other thing. For instance, a single coil pickup (such as on a Fender Telecaster) has a brighter sound than a dual coil

“humbucking” pickup (like those on a Gibson Les Paul). The dual coil design generally is less susceptible to undesirable noise because the two adjacent coils are wired out of phase and thus cancel most external interference. However, the higher treble frequencies are also partially cancelled, thus giving a humbucking pickup its warmer tonal quality.

Other mechanical design characteristics affect the performance of a pickup, too. I’m sure you have noticed the six pickup “pole pieces” that are located under the six guitar strings (oops, I don’t want to forget bass guitars, so make that “or four pole pieces and strings”). In some pickups, these are actually small magnets, while in other styles the pole pieces serve as “conductors” that transmit the magnetic field from a magnet located inside the pickup to the area of the strings.

Often, these pole pieces are adjustable and thus take the form of six small screws. This allows the guitarist to tweak the sound of the pickup to a certain extent. There are no ironclad rules about adjusting the pole pieces, but there are some general factors to be aware of.

First, adjust the action of the strings to suit your style of playing. This is important because it affects the spacing between the strings and pickup(s). Then, patch the instrument into an amplifier. You should observe that as a pole piece is adjusted out, signal level and treble response will increase. But, at a certain point (usually well below the point where the screw clanks into the string) a peak will be reached, and further outward adjustment begins to cause the sound to darken. This happens because the pickup’s magnetic field is beginning to exert an attraction on the metal string and thus “dampens” the minute high harmonic vibrations.

The ability to individually adjust each pole piece also allows the player to balance the tone and volume of the in-

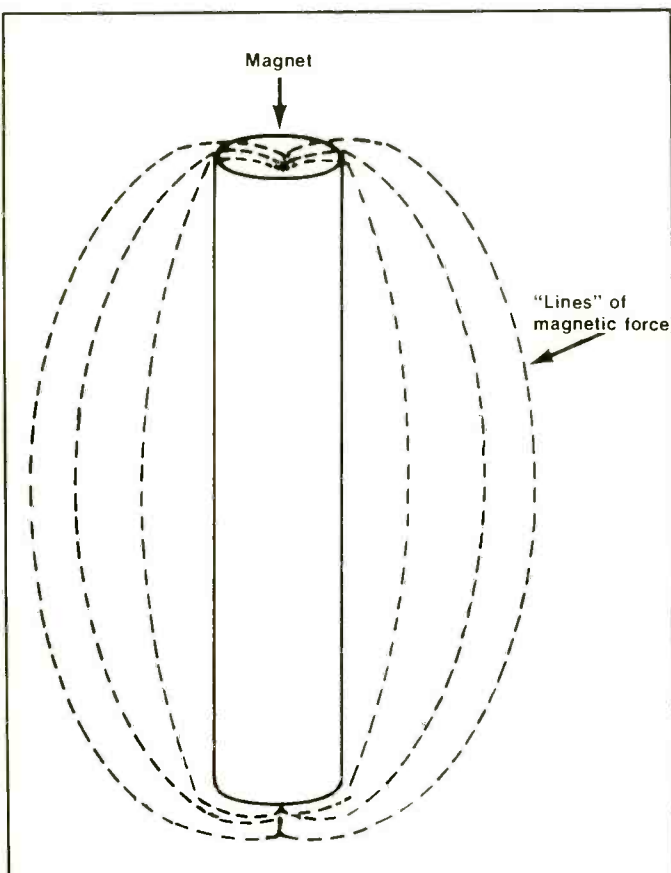


Figure 1: The field surrounding a permanent magnet.

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## “Prepare to spend some time making adjustments...don’t start experimenting a few minutes before a gig.”

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dividual strings. This has to be determined by listening to the audio from the amp and playing scales or runs. If the pole pieces are very much out of adjustment, some strings will be real screamers while others will be rather wimpy in comparison (that assumes the strings themselves are relatively new and of good quality). By adjusting the pole pieces, the string to string variations can be minimized.

Many guitar pickups do not have individually adjustable pole pieces, but are adjusted by an overall “master height” set of hardware. The same general procedure described above should be used to optimize the output level and treble response of this style of pickup.



With some pickups, you may discover that raising the pole pieces (or entire pickup) until optimum output is achieved can introduce a secondary problem that occurs when a string is bent, or slurred. As the string is deflected from its normal position, it is possible that the volume may decrease, and the treble response will also be reduced. This happens because the string is being moved out of the area of strongest magnetism. Fortunately, this doesn’t happen with very many pickups, but if it does, it is then necessary to find a compromise position by trial and error.

After finding the optimum pickup(s) adjustment, it is probably wise to recheck the intonation of each string just in case the magnetic field from the pickup has slightly affected the response of the strings. This is generally a very uncommon problem, but nevertheless is something to watch for.

Let me re-emphasize the importance of experimentation when adjusting a guitar pickup. Prepare to spend a little time diddling with the various screws, so don’t start experimenting a few minutes before a gig. Also, don’t expect radical sonic differences after the adjustment procedure (unless the original settings were really out to lunch). Pickup adjustments should be made to suit your personal tastes and playing style. Listen critically; let your ears be the final judge.

### Tweaking the Fender Rhodes Piano

A Fender Rhodes uses magnetic pickups similar to those found in an electronic guitar. However, there is a separate pickup for each note, so that means you have 73 or 88 sets of adjustments to perform.

Two parameters can be varied on each note: volume and tone color. After removing the top cover, you will observe a row of pickup coils located near the back of the instrument. These are secured to the chassis by screws that extend through the coil mounting brackets. Individual note volume can be varied by loosening the appropriate bracket screw and sliding the coil closer to or farther from the time. Fender suggests a spacing of 1/16-inch to 1/8-inch, with a smaller gap possible in the mid and upper range. My experience has been "closer is better," but I'll let you decide since the gap does affect tone color. Also, you may discover that it is not possible to adjust all coils equally close to their corresponding tine. In this case, determine which coil has the most limited range, and then set adjacent coils to match the volume of the weak one.

By playing up and down the keyboard and sliding coils back and forth, you can really make a big improvement in terms of volume consistency. Also, if the coils had been previously moved away from the tine, you can greatly increase the overall volume of the instrument's output by setting the pickups in closer to the tine.

Tone color, or timbre, can be varied by turning the spring loaded screw which attaches the tine/tone bar assembly to the Rhodes' chassis. There are two of these screws located towards the keyboard, but use the one farthest from the keys.

As the screw is tightened, the tine moves downward in front of the pickup, and when the screw is loosened the tine moves upwards. The higher the tine is in relation to the pole piece of the coil, the deeper the tone color. When the tine is centered dead on with the center of the pole piece, much of the fundamental pitch disappears, leaving mainly harmonics.

The best position for the tine is slightly above the pole piece, but, again, you'll have to make the adjustment by ear. It is also important to hear how each note sounds in comparison with its neighbors; it is usually desirable to have a consistent timbre as you play up and down the keyboard.

The volume and tone adjustments tend to be somewhat interactive because the spacing between coil and tine is changed if either one is moved. So, it will be necessary to go back and forth between each tweaker until you obtain the preferred sound. To further complicate matters, you will probably have to go back and forth between the adjustments on adjacent notes to smooth out the volume and tone irregularities.

After a good set-up procedure, it is very common to hear an amazing improvement in the volume and clarity of a Rhodes; thus making the rather tedious procedure seem worthwhile after all. And, before you button the Rhodes back up, it would probably be wise to recheck the tuning. Use an electronic tuner and carefully adjust the tuning springs on the tines, remembering to tune the upper end progressively more sharp (compared to the middle octave) and the bottom end progressively flatter. This slight "fudging" should go about thirty cents sharp (or flat) from precise tuning. A good ear for pitch really helps in getting the keyboard's temperament sounding right.

### The Wrap-Up

I hope this article has helped clear up some of the mysteries about adjustments to magnetic pickups. Put your ears to work, and you can improve the sound of an average guitar or Fender Rhodes.

## ALL YOU NEED IS EARS

The memoirs of modern recording genius George Martin.

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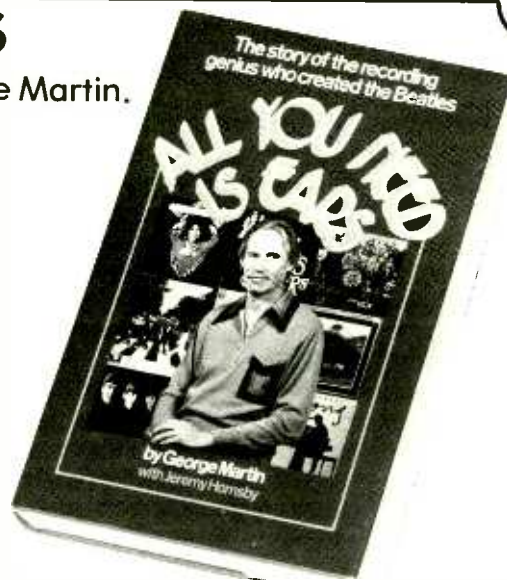
Now, in ALL YOU NEED IS EARS, Martin details his amazing career in the vanguard of modern recording. . . from the early days when wax was the medium, 78 was the speed, and an echo chamber was a small tiled room. . . to the advent of revolutionary digital reproduction. His vast experience makes him an expert commentator on fascinating backroom details like acoustics, arrangement, orchestration, microphone techniques, and more.

In addition, Martin offers an entertaining view of how he put together hit records, what it was like to be tapping The Beatles endless repertoire of songs, the hardship and excitement of forming his successful independent studio, AIR.

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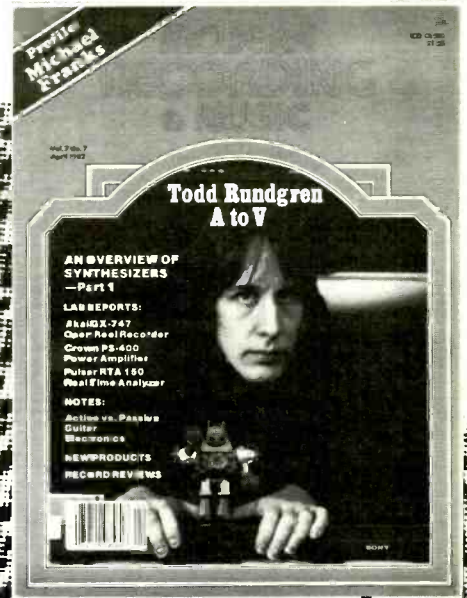
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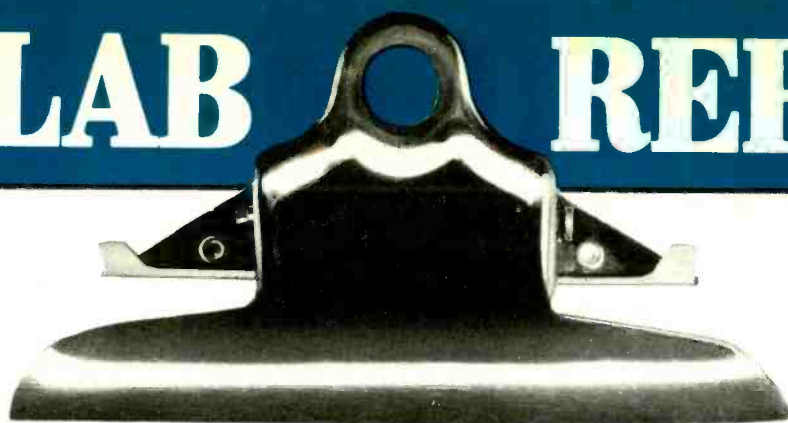
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NORMAN EISENBERG AND LEN FELDMAN

## Micmix Dynafex Noise Reduction System



**General Description:** Dynafex is the trademark of a new noise-reduction system offered by Micmix Audio Products (the unit received for testing has the model number D-2B on its panel). A single-ended system, Dynafex operates on program material without first encoding it. The processing used includes both downward expansion and dynamic filtering.

As shown in the accompanying block diagram (*Fig. 1*) of one channel of the unit, the expander consists of an amplitude detector, the threshold control and a voltage-controlled amplifier (VCA). As input signal levels to the Dynafex decrease below a predetermined threshold level

(set by the user), these circuits cause gain reduction at an increasing rate—that is, the lower the signal level, the lower the gain. *Figure 2* shows the output for a given input signal level when the threshold level has been set to  $-30$  dB. The sections in the block diagram identified as Frequency Detector and VCF (voltage-controlled filter) form a dynamically variable low-pass filter. This “sliding” filter opens and closes to increase or to reduce the bandwidth of the Dynafex in accordance with the input signal.

A two-channel unit, the Dynafex provides a threshold control and a bypass switch separately for each channel.

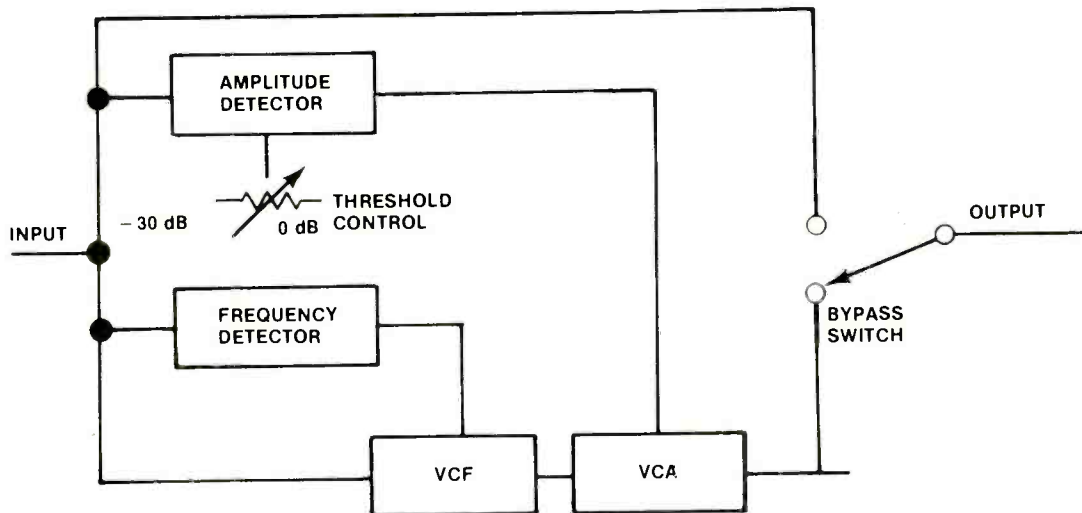


Fig. 1: Micmix Dynafex System: Simplified diagram of one channel of unit.

In addition the front panel includes a stereo/mono switch and a power off/on switch. In "mono" mode, the two channels are completely independent so that two totally different mono sources may be processed. When the switch is moved to "stereo," both channels are ganged together via the Channel 1 threshold control which then sets the threshold level for both channels.

Above each threshold control is an LED that glows red for input signals that are above threshold level (no expansion takes place). The LED glows green when the input signal is below the threshold level, indicating that some expansion is occurring. An additional LED above

the bypass switch glows red when the switch is pushed in (for bypass, or no processing). The power switch also has its own LED. The front panel, black matte with white markings, is of rack-mount width and suitably slotted at the ends.

In addition to the front panel controls, there are two circuit jumpers (one per channel) on the internal circuit board, access to which is gained by removing the top cover which is held in place by six screws. The jumpers may be inserted into one of four possible pairs of holes for recommended reference levels if the actual reference level in a given sound system is not known.

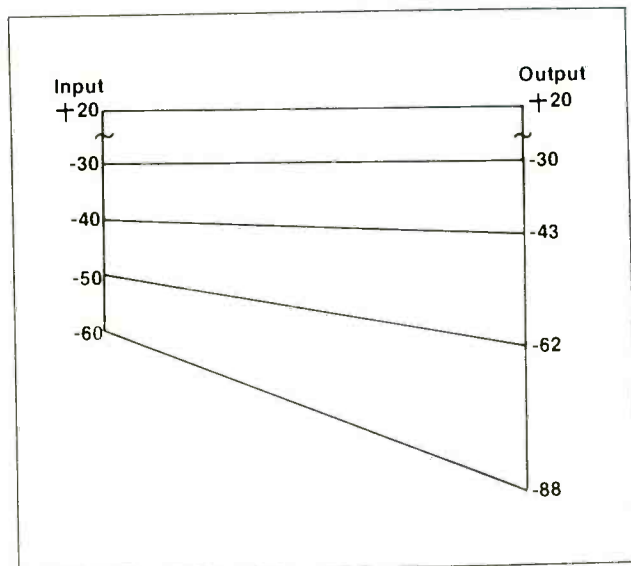


Fig. 2: Micmix Dynafex System: Dynafex input/output characteristics at a threshold level of  $-30$  dB.

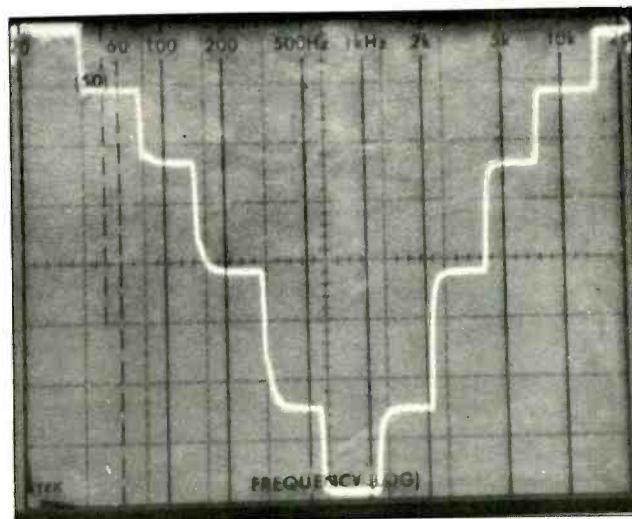


Fig. 3: Micmix Dynafex System: Uniformly decreasing input level "steps" of 10 dB each result in downward-expanded output levels after being processed by the unit.

Signal connections to and from the Dynafex are made at the rear. Barrier-strip screw terminals are used. The inputs are active-balanced (plus, minus and ground); the outputs are single-ended (plus and ground). A three-section jumper, installed on the barrier-strip for each channel, is supplied as a convenience for single-ended operation only (it should be removed for balanced-in/unbalanced out, or for balanced in/out hookups). The AC power cord is a three-line type and connects to the chassis by a detachable plug. The unit is fused.

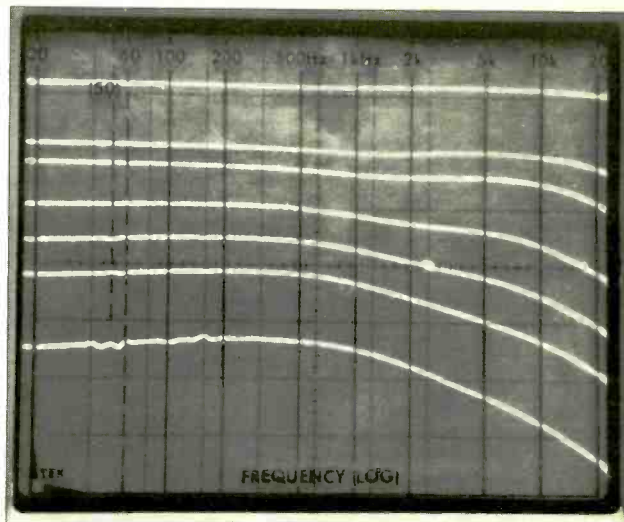
**Test Results:** Specifications for the Micmix Dynafex were readily confirmed in MR&M's lab tests. In addition some of its action was observed on the 'scope—photos of which are reproduced here. For the display in *Figure 3*, input signal levels were set at approximately 20 dB above threshold. Note that in this display we are not sweeping frequencies (disregard the frequency notations at the top of the display). Rather we have set the analyzer to respond only to the single frequency used in this test. All we are doing here is varying input signal amplitude in 10-dB steps while examining on the analyzer the output signal from the Dynafex.

Beginning at the left, as we reduce the input signal level, we see linear steps for the first two 10-dB increments (vertical sensitivity of the display is 10 dB per division). At the third step, downward expansion has begun, so that 10 dB of change of input signal level results in about 17 dB of level change at the output.

In the fourth step, a 10-dB change in input results in nearly a 25-dB decrease in output level. The reverse occurs at the right of this display as we begin to increase input signal level in 10-dB steps. We did notice that the attack time of the expansion circuitry was somewhat faster than decay time, which we think is correct since it yields fewer side effects than if the reverse were true.

For *Figure 4* we used the more traditional spectrum analyzer display of frequency versus amplitude. Here, we fed sweeping input signals, from 20 Hz to 20 kHz, to the input of the Dynafex at various levels, beginning with the top trace which was set just above downward expansion threshold level, and dropping down in roughly 10-dB steps. Note that the top trace shows flat response over the entire audio range, but as input level drops the action of the dynamic filter becomes apparent. With no loud, high-frequency signals present, the dynamic filter "closes down" the bandwidth, and at very low signal levels (corresponding to hiss or other high-frequency noise), treble response is severely attenuated.

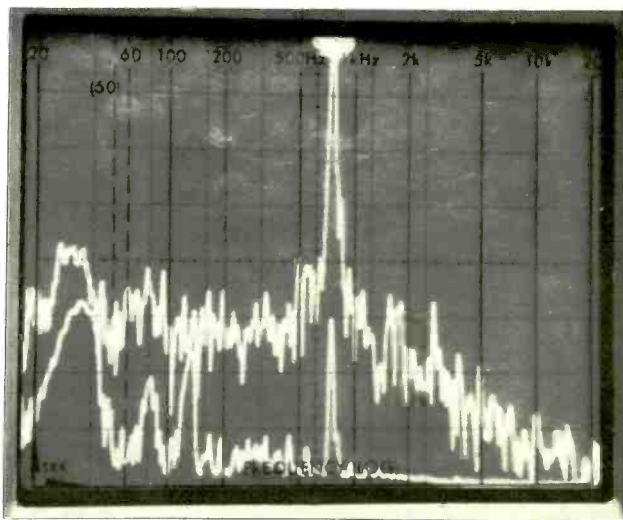
The spectrum analyzer sweeps in *Figure 5* really sum up the action of the Dynafex. Here, we first applied a fairly high-level signal to a tape deck. Then, using a non-premium grade of tape, we recorded the 1-kHz tone for several minutes. Next we lowered the level of the tone by some 30 dB and made a second tape recording. Both recordings were played back through the Dynafex, and sweeps were made of the playback signal over a spectrum from 20 Hz to 20 kHz. The upper sweep was obtained while playing back the higher-level 1-kHz tone itself), and we see the distribution of noise over the audio range.



**Fig. 4: Micmix Dynafex System:** The action of the dynamic low-pass filter section of the system is apparent as lower level sweeps have their high frequencies increasingly attenuated.

Without changing any gain settings on the spectrum analyzer or anywhere else in the system, we then played back the second recording of the lower-amplitude 1-kHz recorded tone. The downward expansion of the Dynafex, plus the action of its dynamic filter, are clearly evident in the lower trace of *Fig. 5*. Not only is the low-level signal further reduced in amplitude (it is down some 50 dB as compared with the higher-level signal), but noise—particularly high-frequency noise—has been attenuated by as much as 30 dB.

**General Info:** Dimensions are 19 inches wide; 1¾ inches high; 8 inches deep. Weight is 7 lbs. Price: \$750.



**Fig. 5: Micmix Dynafex System:** When "loud" signal is applied to the Dynafex circuit, no reduction in tape noise is observed (upper trace). When low-level signal is applied, downward expansion and dynamic filtering take place (lower trace).

**Individual Comment by L.F.:** The principle of downward expansion for increased dynamic range is not new. With its pro and consumer equipment, dbx has been doing that for years. Neither is dynamic filtering new—Burwen's dynamic filter idea has been adopted and promoted by National Semiconductor who now offers it in chip form. What Micmix has cleverly done, with its Dynafex system, is to combine the best elements of both downward expansion and dynamic filtering to come up with a single-ended noise-reduction system which—if used properly and with discretion—performs what might be called sonic miracles with program material that is loaded with unwanted, low-level noise; noise that no double-ended (encode/decode) system can deal with.

In addition to the lab tests, I subjected the Dynafex to extended listening tests which confirmed the smooth action of the system that the earlier lab tests suggested would be the case. Of course, the Dynafex can be misused and over-used, with audible side effects such as a real or apparent loss of high-frequency detail, and even occasional "breathing." However, in my opinion, the combined use of downward expansion plus dynamic low-pass filtering has been very effectively executed by Micmix. Given the choice, I will gladly subject myself to a very occasional and minor signal-processing side effect in return for a silent background from program material that would otherwise sound extremely noisy.

**Individual Comment by N.E.:** The Micmix Dynafex is a sophisticated and fairly expensive piece of equipment designed to do a cleaning up job on really bad (noisy) source material. Which raises the question of just how much really dirty material is out there, other than perhaps a pile of rock albums perilously close to coffee and Danish crumbs waiting to be sent out over local sta-

tions. Whether it would be wiser to get cleaner source material to begin with remains (as it does with all "heavy" noise reduction systems) a nice question. As for non-rock oriented material, the action of the Dynafex becomes fairly subtle, and it is very easy—as Len puts it—to mis-use or over-use it, and in such instances the filtering and the restricted bandwidth became all too apparent. My advice is to try before you buy.

Some other questions regarding the unit itself come up. For one thing, the lights on the front panel can be confusing in that the red LED comes on when the unit is put into bypass. The usual style is to have a light turn on when something is being used, not bypassed. Obviously, here the idea was to have the red light signify a stopping of the action, which is in keeping with the way the other LED for threshold level operates. On the other hand, when power is turned on, the power LED glows red to indicate a "go" condition.

Signal connections at the rear are made by screws on a barrier strip, which means stripping cable lead ends and not terminating them with any of the standard types of connectors. Personally, I would have preferred plugs or connectors of some sort—aside from neatness I feel they also make for more secure hookups, especially for a device that is patched into a system at line-level.

Speaking of which, it would be nice to have the optional reference-level change available by a switch rather than with the need to shut down the unit, disconnect its AC cord, remove six screws and lift the top panel to get at that adjustment.

The owner's manual seems rather minimal for a \$750 product.

So all told, while I can appreciate and even admire the engineering and clever circuit design that has gone into the Dynafex, I can recommend it only qualifiedly.

#### MICMIX DYNAFEX NOISE REDUCTION SYSTEM: Vital Statistics

PERFORMANCE CHARACTERISTIC	MANUFACTURER'S SPEC	LAB MEASUREMENT
Input reference	0 dB = 0.775 V	(Reference)
Input impedance	20 K ohm balanced 10 K ohm unbalanced	Confirmed Confirmed
Nominal level (internal jumper)	- 10, 0, + 4, + 8 dBV	Confirmed
Maximum level	+ 20 dBV	+ 21 dBV
Output source impedance	15 ohms, unbalanced	Confirmed
Maximum output level (into 600 ohms)	+ 20 dBm	+ 21 dBm
Noise (unwtd, 20 Hz to 20 kHz)	- 90 dBm	90 dB (re 0.775 V)
Frequency response	± 0.5 dB, 20 Hz to 20 kHz	± 0.1 dB, 20 Hz to 20 kHz
Dynamic range	greater than 110 dB	111 dB
Harmonic distortion, 20 Hz to 20 kHz	less than 0.1%	0.12% at 1 kHz 0.07% at 20 kHz 0.10% at 20 Hz
Noise reduction	Up to 30 dB or more	Confirmed
Power requirements	115/230 V, 10 VA	8 W

CIRCLE 1 ON READER SERVICE CARD

## Eddor MA 125 Mixer Amplifier



**General Description:** The Eddor MA 125 is a six-input monophonic power amplifier of great versatility and high-quality construction and performance. The inputs are all modular, and the types of input modules available are designed to interface the amplifier with the widest possible variety of sources. Input modules so far announced include an auxiliary unbalanced hi-Z RCA-style; a hi-Z microphone unbalanced; a hi-Z line bridging; a lo-Z microphone balanced; a magnetic phono; a telephone balanced line; and a tri-tone signal generator. The modules are inserted into suitable openings at the rear of the amplifier, and their respective signal levels are adjusted by knob controls on the front panel.

The amplifier's output is taken from either of two modules that may be used at the rear. One output module handles direct connections to a speaker system. An alternate transformer module may be substituted which allows the amp's rated output power to be fed to loads of 4, 8 or 16 ohms impedance, or to a 70.7 or 25 volt balanced distribution line.

Of standard rack-mount width, the front panel is fitted with the requisite panel-mounting holes and end handles. In addition to the six level control knobs for the six input modules, there's a master volume control. Two more controls serve to adjust treble and bass individually. Also on the front panel are the amplifier's power off/on switch, a power indicator, and a clipping indicator.

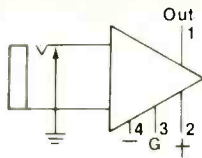
In addition to the modules, the rear panel contains a receive/send pair of jacks for patching in an accessory device. When no such patching is used, the jacks are connected by a short jumper cable. The AC line is fused and

the three-wire power cord provided with the unit is detachable.

According to the manufacturer, the number and variety of input modules for use with the MA 125 is ever-growing, and will include distinctive signal and tone generators that may be used to provide alarms or period signalling within the system.

**Test Results:** Except for high power output at 20 kHz, the Eddor MA 125 met or exceeded its performance specs in *MR&M's* tests. At mid-frequencies, the amplifier did much better than spec, with THD readings of only 0.27 percent for rated power output of 125 watts (4-ohm load). At the low end (20 Hz) where many power amplifiers often have trouble meeting output and distortion specs because of inadequate power supplies, the MA 125 was still performing nicely, delivering its rated power into a 4-ohm load with only 0.4 percent THD. However, at a frequency of 20 kHz, the amp produced 1 percent distortion for an output level of only 60 watts. "Pushing" the output up to its rated value of 125 watts caused distortion to rise to 15 percent. (For additional insight into this test, see Mr. Feldman's comments below.)

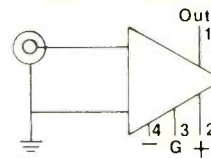
Most of the measurements shown in our "Vital Statistics" chart were taken via the high-level AUX input module (AIM-10). The reason for the large discrepancy between the input sensitivity figure published by Eddor and our measured results arises, we think, because Eddor may have set the gain pot of the input module at some mid-setting while we set it for maximum gain. The important point here is that the module does have its



### HZM 10 Hi-Z microphone unbalanced input

**SPECIFICATIONS:**

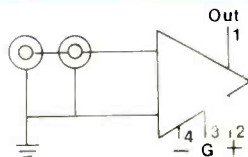
GAIN: 45 dB  
 WEIGHT: 1.6 oz., (45 grams)  
 MOUNTING: Two 8-32 screws 3/8" long  
 INPUT JACK: Phone jack 1/4" tip/sleeve  
 DISTORTION: Less than 0.1% THD  
 DIMENSIONS: LxWxH 2-1/8"x1-3/8"x3-3/8"  
 POWER SUPPLY: ± 15 v supplied by amplifier  
 HUM AND NOISE: Greater than 84 dB below maximum output  
 INPUT IMPEDANCE: 100,000 ohms  
 INPUT SENSITIVITY: .0007 v adjustable  
 FREQUENCY RESPONSE: 20-20,000 Hz. + 0, - 0.1 db



### AIM 10 Auxiliary input module unbalanced HI-Z RCA style jack

**SPECIFICATIONS:**

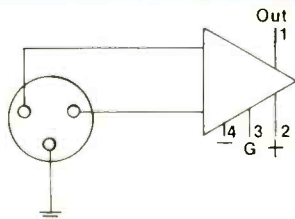
GAIN: 20 dB  
 WEIGHT: 1.6 oz., (45 grams)  
 MOUNTING: Two 8-32 screws 3/8" long  
 INPUT JACK: RCA style  
 DISTORTION: Less than 0.1% THD  
 DIMENSIONS: LxWxH 2-1/8"x1-3/8"x3-3/8"  
 POWER SUPPLY: ± 15 v supplied by amplifier  
 HUM AND NOISE: Greater than 90 dB below maximum output  
 INPUT IMPEDANCE: 250,000 ohms  
 INPUT SENSITIVITY: .117 v adjustable  
 FREQUENCY RESPONSE: 20-20,000 Hz. + 0, - 0.1 db



### MPP 10 Magnetic phono input

**SPECIFICATIONS:**

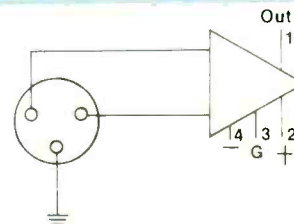
GAIN: 50 dB  
 WEIGHT: 2 oz., (57 grams)  
 MOUNTING: Two 8-32 screws 3/8" long  
 DISTORTION: Less than 0.1% THD  
 INPUT JACKS: Two RCA style  
 DIMENSIONS: LxWxH 2-1/8"x1-3/8"x3-3/8"  
 POWER SUPPLY: ± 15 v supplied by amplifier  
 HUM AND NOISE: Greater than 70 dB below maximum output  
 INPUT IMPEDANCE: 47 K  
 INPUT SENSITIVITY: .0055 v adjustable  
 FREQUENCY RESPONSE: RIAA



### LZM 10 Lo-Z line microphone balanced input

**SPECIFICATIONS:**

GAIN: 65 dB  
 WEIGHT: 2.6 oz., (74 grams)  
 MOUNTING: Two 8-32 screws 3/8" long  
 INPUT JACK: XLR-3 female  
 DISTORTION: Less than 0.1% THD  
 DIMENSIONS: LxWxH 2-1/8"x1-3/8"x3-3/8"  
 POWER SUPPLY: ± 15 v supplied by amplifier  
 HUM AND NOISE: Greater than 86 dB below maximum output  
 INPUT IMPEDANCE: 50 to 250 ohms  
 INPUT SENSITIVITY: .00073 v adjustable  
 FREQUENCY RESPONSE: 20-20,000 Hz. + 0, - 0.1 db



### LBM 10 Hi-Z line bridging input

**SPECIFICATIONS:**

GAIN: 20 dB  
 WEIGHT: 2.9 oz., (82 grams)  
 MOUNTING: Two 8-32 screws 3/8" long  
 INPUT JACK: XLR-3 female  
 DISTORTION: Less than 0.1% THD  
 DIMENSIONS: LxWxH 2-1/8"x1-3/8"x3-3/8"  
 POWER SUPPLY: ± 15 v supplied by amplifier  
 HUM AND NOISE: Greater than 89 dB below maximum output  
 INPUT IMPEDANCE: 100,000 ohms  
 INPUT SENSITIVITY: .156 v adjustable  
 FREQUENCY RESPONSE: 20-20,000 Hz. + 0, - 0.1 db

Edcor MA 125: Diagrams and specifications of some of the modules available for the MA 125.

own continuously variable gain adjustment and it can actually deliver a great deal more amplification (if it is needed) than the nominal 20 dB listed in the specs for that particular module.

The ranges of the bass and treble controls are shown in Fig. 1. The only difference between Figs. 1A and 1B is the setting of the dotted cursor line. In Fig. 1A, it was set to read maximum bass control boost and cut (+15.5 dB and -16.5 dB). In Fig. 1B, the cursor was moved to 10 kHz to read boost and cut of the treble control at 10 kHz (+15.5 dB and -17.6 dB).

To see how closely it conformed to the RIAA equalization playback curve, we tested the magnetic phono preamp module. Figure 2 shows the RIAA response obtained with that module (MPP 10). With the curve referenced to "0 dB" at 1 kHz, it has the familiar bass boost and treble rolloff of the RIAA playback characteristic. For the display shown in Fig. 3, we fed an inverse RIAA frequency sweep through the amp via the phono module, this time expanding the vertical scale of our test instrument to 2 dB per division. Maximum error of the RIAA curve came to 2 dB at 130 Hz. Since the main amplifier, measured through the AUX module, had shown response flat all the way down to 13 Hz (for -1 dB), we had to conclude that the error in response was to be found primarily in the circuitry of the phono input module. Admittedly, 2 dB is rather a substantial error in the RIAA equalization, but if the user is aware of the error (assuming it exists for all copies of this input module), he can easily offset it by backing off ever so slightly on the bass control.

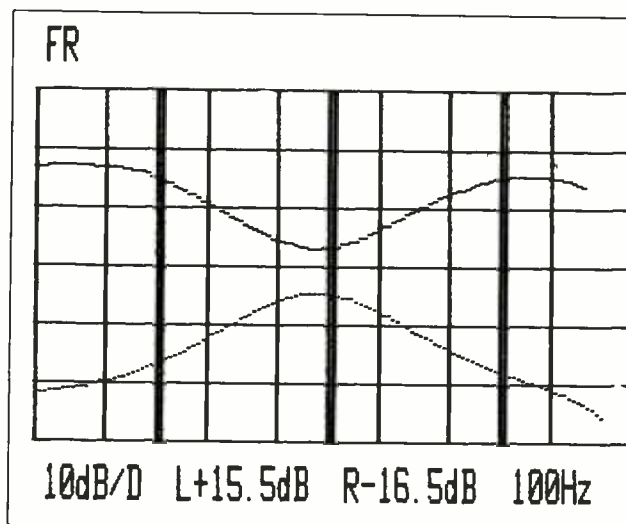
The two types of microphone modules performed pretty much as their specs would indicate. As the diagrams next to each module's specifications show, there are no transformers involved in any of these modules; they all work by using op-amps. Signal-to-noise ratios for all the modules were at least as good as for the main amplifier itself, or as good as the main amp operated with the AUX module, since some module must be used with the amp in order to gain access to its input.

**General Info:** Dimensions are 19 inches wide; 5-1/4 inches high; 13 5/8 inches deep. Weight is 21 pounds (with direct output module); 26 pounds (with transformer output). Basic price: \$317. Modules supplied with test sample: LZM 10 (lo-Z mic balanced), \$18; HZM 10 (Hi-Z mic unbalanced), \$26; AIM 10 (auxiliary unbalanced Hi-Z RCA style jack), \$18; MPP 10 (magnetic phono), \$18; LBM 10 (hi-Z line bridging), \$21.

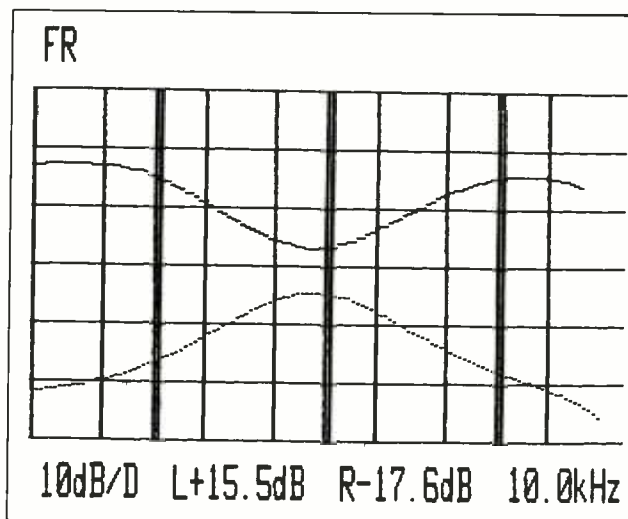
**Individual Comment by L.F.:** In my opinion, the Eddor MA 125 design, both conceptually and in its execution, is nothing short of brilliant. Talk about flexibility and versatility! Eddor supplied our test sample unit with five different modules pre-installed at the rear. This was done obviously so that we could evaluate most of the available modules. Of course, from the standpoint of a user of the MA 125, all of the same kind of module could be chosen (e.g., the LZM-10 low-impedance balanced input microphone module, so as to form a six-microphone

mixer/amplifier). Any combination of available modules could be inserted in the slots at the rear in any order. Even the output arrangement is flexible to the degree that one can choose a direct-output module (as was supplied in our test sample) which connects directly to low-impedance speakers (preferably adding up to a combined net impedance of 4 ohms, but able to be used with 8 ohms also at somewhat lower output levels), or a transformer output module for connection to speaker systems requiring 70-volt or 25-volt lines, or voice-coil operation of 4-, 8-, or 16-ohm speakers where equal power output capability is desired regardless of impedance.

The emphasis here is clearly on compactness and versatility rather than on "super specs." Rated harmonic distortion is 1 percent, rather high for a published figure these days, even for an amplifier not intended for "high fidelity" applications. Actually, the amp did much better



(A)



(B)

Fig. 1: Eddor MA 125: Plots of maximum boost and cut of bass and treble controls.



than that at mid-frequencies, and performed very ably at the extreme low end too. My surprise (I will not say "disappointment" for reasons that will become clear in a moment) came when measuring rated power at 20 kHz, as discussed above in "Test Results."

Now, I know that dyed-in-the-wool hi-fi people will be shocked by this, but I do not regard this failure to meet the high-end power spec as particularly bad. Were this an amp intended for home use, the FTC might have something to say about the fact that the unit failed to meet its power specs according to the *FTC's* rule about such things, but in the real world of music and speech sound reinforcement, we all know (or should know) that the distribution of frequencies in music and speech is such that even if mid-frequencies drive the amp to full rated output, the high-frequency content (especially up at 20 kHz) is going to be at least 6 dB, and maybe 10 or 20 dB lower—depending on the type of program material.

Even if *that* were not so, think for a moment about what the first possible harmonic of 20 kHz is that might be a component of the 15-percent distortion we measured at full rated output. It occurs at 40 kHz, a frequency which I couldn't hear even when I was a lot younger. So, whether we like to admit it or not, a 20 kHz tone with 15-percent distortion is still going to sound fairly "pure"—if you can hear it at all!

This point, and the 2-dB error noted at the 130 Hz frequency in the RIAA playback curve notwithstanding, I am still very pleased with the concept and layout of the Edcor MA-125. A great deal of mixing versatility and control can be amassed in a single unit by the proper choice of those inexpensive modules. My enthusiasm, somewhat tempered by the so-so basic performance of the amp, is nevertheless sufficient to give the Edcor MA 125 a "yes" vote.

**Individual Comment by N.E.:** If the operator can remember what the six front-panel knobs are controlling (or better, stick little tags over them to identify the input module each knob handles), he or she can set up a really versatile sound-reinforcement control and amplification system that is apparently rugged, well-thought out and capable of more than passing accuracy in sound reproduction. Apropos of which, I wonder how much it would raise the amp's cost to incorporate above each knob a little slot into which small cards could be inserted, like those used on file drawers. Of course, then anyone could come along and wreak havoc with relative levels—but I recall a situation at a summer theatre last August when the operator of a simple three-channel mixer (being used for sound effects on stage) actually forgot which knob controlled what sound, and the play director was beside himself until the simple obvious solution was suggested: label those controls!

The only other suggestion I have for this amp is a more professional type of connector for the direct-output-to-speaker module. The present one consists of two simple screws; on a unit of this caliber I would expect to find 5-way binding posts. Again, I suppose it's a matter of cost.

As for the 3-dB drop in ultimate power output for rated distortion at 20 kHz, I do not regard that as of major importance. As with Len, I have yet to be convinced that rising harmonic distortion beyond 10 kHz is going to make a significant audible difference, particularly in a sound-reinforcement setup where your audience is not sitting breathlessly listening for every last ultimate tweak in the program material. Of course, you can have that kind of performance if you want it—in terms of a double-or-more cost amplifier plus a separate six-input mixer. But considering what the Edcor MA 125 does give you in one 25-pound or so package, and at the price, I would say its overall performance is more than "competent." It is, first and last, an audioman's "tool"—and a very useful one at that.

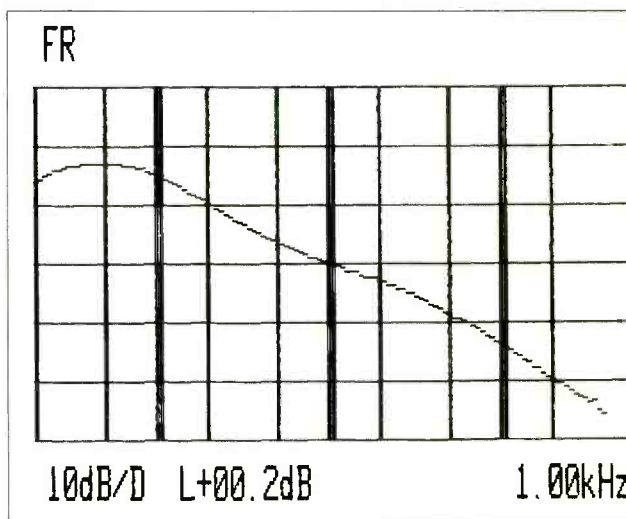


Fig. 2: Edcor MA 125: RIAA playback response obtained feeding constant amplitude signals through the MA 125 via the MPP 10 magnetic phono input module.

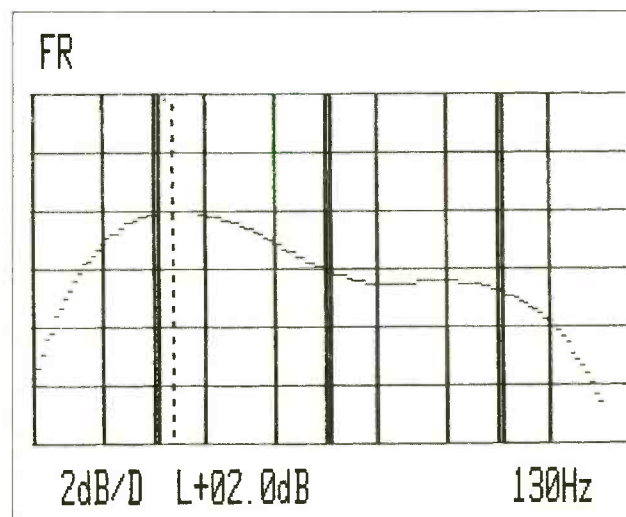


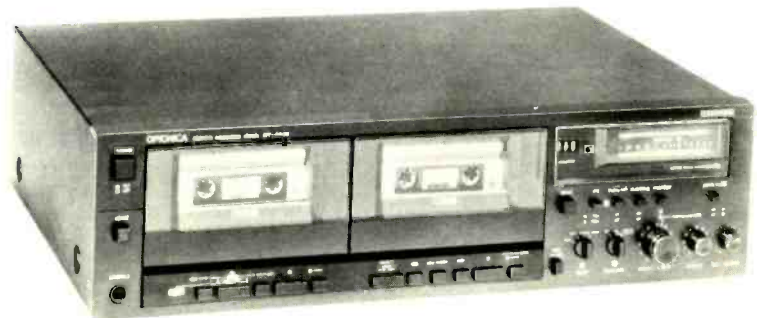
Fig. 3: Edcor MA 125: Expanded display shows deviation from true RIAA response when inverse RIAA test signal sweep is applied to the 125 via the phono module.

EDCOR MA 125 MIXER/AMPLIFIER: Vital Statistics

PERFORMANCE CHARACTERISTICS	MANUFACTURER'S SPEC	LAB MEASUREMENT
Continuous power for rated THD		
8 ohms, 1 kHz	NA	118.6 watts
4 ohms, 1 kHz	125 watts	186 watts
FTC rated power (20 Hz to 20 kHz)	125 watts	60 watts (high end limit)
THD at rated output		
1 kHz, 4 ohms	1.0%	0.27%
20 Hz, 8 ohms	1.0%	0.40%
20 kHz, 8 ohms	1.0%	15.0% (see report)
IM distortion, rated output		
SMPTE	NA	1.0%
CCIF	NA	2.0%
IHF	NA	3.23%
Frequency response at 1 Watt for -1 dB	20 Hz to 20 kHz	13 Hz to 25 kHz (via aux module)
Signal-to-noise re 1 watt, "A" wtd, IHF	NA	82 dB
Signal-to-noise re rated output, "A" wtd	88 dB	NA
Dynamic headroom, IHF	NA	2.3 dB
Damping factor, 50 Hz	NA	31
Input sensitivity, IHF	NA	3.4 mV
re rated output	0.117 volt	0.027 volts (see report)
Power consumption, idling; max	60; 430	54; 277

CIRCLE 2 ON READER SERVICE CARD

## Optonica RT-6605 Cassette Deck



**General Description:** A "two-in-one" unit, the Optonica RT-6605 contains two separate cassette sections, one for recording and the other for playback. The idea is to provide the normal functioning and features of a cassette machine while also adding the option of a built-in duplicating facility. The left-hand portion of the deck, called "Deck 1," is for playback, while the right-hand portion, or "Deck 2," is for recording—from a tape being played on Deck 1 or from any outside line source. Connections and simultaneous start of both transports for the dubbing operation are built into the unit. Connections for line-level external sources are the usual signal jacks at the rear. The recording portion (Deck 2) has a nominal playback "monitor" facility although, as the owner's manual emphasizes, playback quality is much better with the Deck 1 facility. Moreover, the playback option of Deck 2 does not employ a separate play head; it re-

quires rewinding the recorded tape and engaging a switch that puts Deck 2 into play mode, so that direct off-the-tape monitoring is not possible.

For Deck 1 (playback) there's an equalization selector that chooses 70 or 120 microseconds. For Deck 2 (recording) there's a four-position selector that chooses 70 or 120 microseconds. For Deck 2 (recording) there's a four-position selector (FeCr; CrO<sub>2</sub>; normal; metal) plus a bias fine-adjust control. Each "deck" has its own Dolby-B switch. Recording levels are shown on a twin bar fluorescent display (peak values). The tape counter functions only for Deck 2 (recording).

The RT-6605 incorporates Sharp's APSS (automatic program search system) by means of which a recorded tape—on which there are at least three seconds of space between different selections—can be run in fast-forward or reverse to get to the start of a given section. Transport

buttons on each "deck" are soft touch types that permit changing from one transport mode to another without the need to press the "stop" button first.

To the left of the Deck 1 tape compartment are the power off/on switch; the eject button for Deck 1; and a stereo headphone jack whose output volume is controlled by the output level knob elsewhere on the panel. Transport controls for Deck 1 are below the cassette compartment. Included is a pause button.

Deck 2 (recording) is to the right of Deck 1, with its own transport controls grouped below it. The pause button here also serves as a "one-touch" start button for the Deck 1 to Deck 2 dubbing operation. Just to the right of these controls is a record-mute button.

The signal meter is near the upper right-hand corner of the panel. At its left are the tape counter and reset but-

ton. Below are the Deck 2 eject button; the Deck 1 EQ selector; the Deck 1 Dolby switch; a peak-hold switch for the meters; the "monitor" switch; a dubbing switch that selects the recording input for Deck 2 from either Deck 1 or an outside line source; the Deck 2 tape selector; the Deck 2 Dolby switch; recording level controls (dual concentric); an output level control (operates on both the line outputs and the headphone jack); and the Deck 2 bias adjustment.

The line in and out jacks are at the rear. There is no mic jack.

**Test Results:** The Optonica RT-6055 made its best performance in our tests with metal tape, showing fairly consistent superiority over high-bias tape and normal-bias tape in response, signal-to-noise, distortion and recording headroom. The complete test data, listed in our

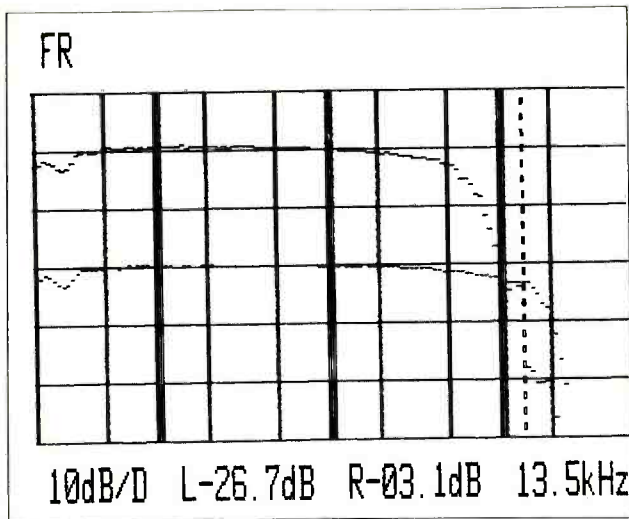


Fig. 1: Optonica RT-6605: Lower trace (R) shows record/play response at -20 dB record level for Maxell XL-IS tape.

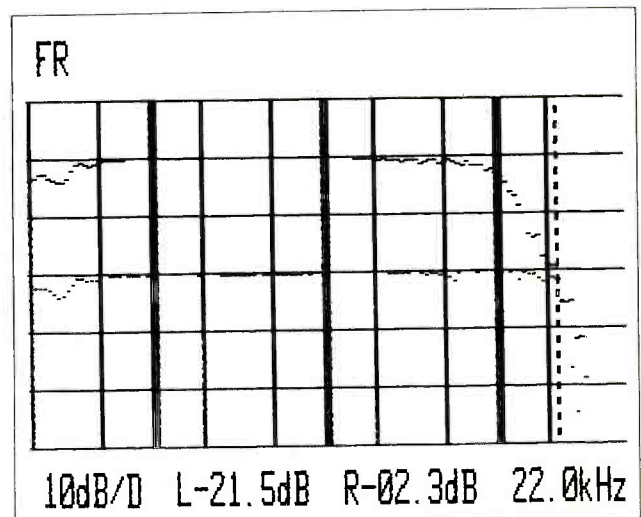


Fig. 3: Optonica RT-6605: Lower trace shows record/play response at -20 dB record level using Fuji metal tape.

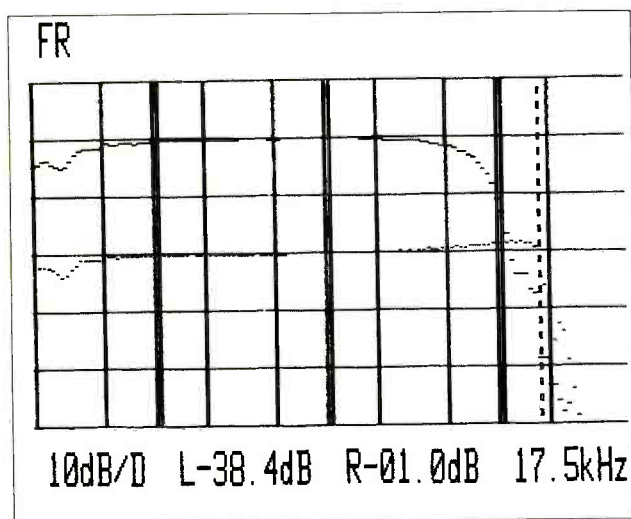


Fig. 2: Optonica RT-6605: Lower trace shows record/play response for Maxell IIS (hi-bias) tape at -20 dB record level.

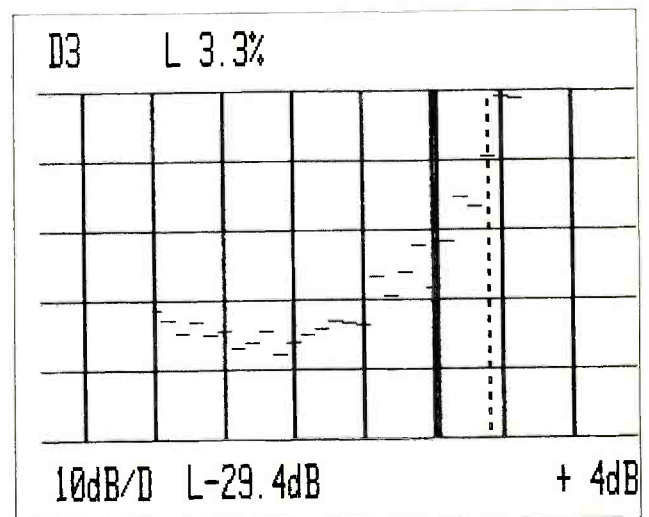


Fig. 4: Optonica RT-6605: Third-order distortion vs. record level (Maxell UD-XLIS tape).

"Vital Statistics" table, add up to an average good cassette deck. While the response obtained with the normal-bias ferric-oxide sample was somewhat disappointing, the results measured for the other two tape samples were as good as, or better than, published specs.

Figures 1, 2 and 3 show our usual record/play frequency response plots from 20 Hz to 20 kHz. In each case the upper plot was measured at a recording level of 0 dB on the deck's meters (corresponding to 200 nWb/m, or Dolby calibration level). The lower plot (designated as the "R" channel reading) was taken at a -20 dB record level. Tape samples used were Maxell UD-XLI for normal bias; Maxell UD-XL-IIS for high-bias "chrome equivalent"; and Fuji Metal for metal bias. We followed the owner's manual instructions in setting the deck's fine-bias control for each tape. (Note that in Fig. 2 response is down 1.0 dB at 17.5 kHz. Since the next available test frequency on our Sound Technology 1500A Tester is 18.5

kHz—at which point response was down more than 5 dB—we interpolated the -3 dB point as being at 18 kHz, the figure listed in the "Vital Statistics" table.)

Third-order distortion versus recording level is shown in Figures 3, 4 and 5. The dual vertical line represents 0 dB record level. The dotted line cursor has been positioned, in each case, to read the approximate 3 percent (maximum record level) point for each of the tapes tested.

Spectral noise distribution for the three tapes is shown in Figures 7, 8 and 9. In each instance we measured from that reference point which corresponded to maximum record level (3 percent 3rd-order distortion at mid-frequencies). The 1/3-octave plots of noise content are shown from 20 kHz down to 20 Hz. In each of these figures there are two plots: One with, and one without, Dolby. Readings at the top of each display are the CCIR/ARM weighted signal-to-noise ratios obtained, with the lower of the two results (designated "L" in each

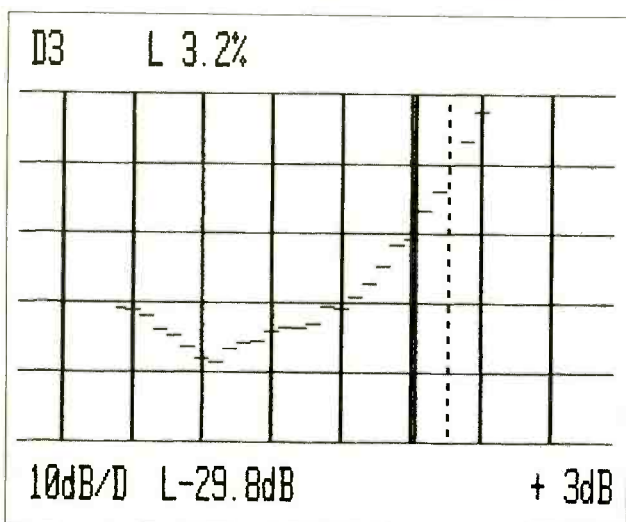


Fig. 5: Optonica RT-6605: Third-order distortion vs. record level (Maxell UD-XLIIS).

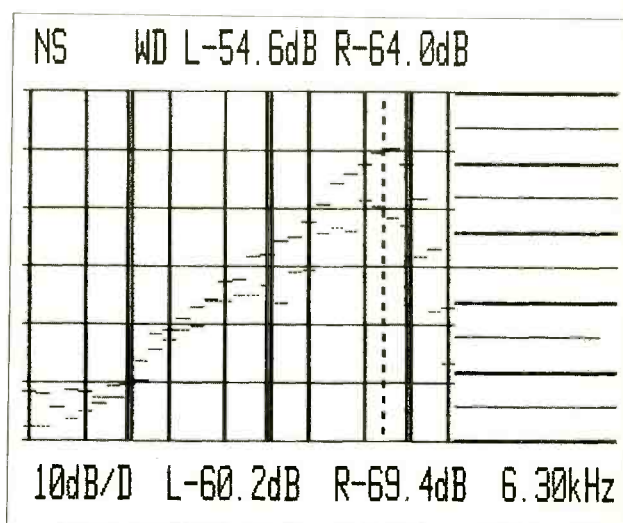


Fig. 7: Optonica RT-6605: S/N analysis with Dolby (R) and without Dolby (L) (Maxell UD-XLI).

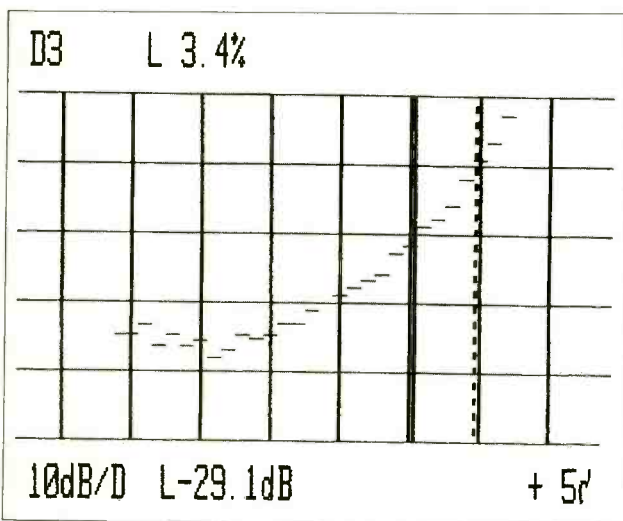


Fig. 6: Optonica RT-6605: Third-order distortion vs. record level (Fuji metal tape).

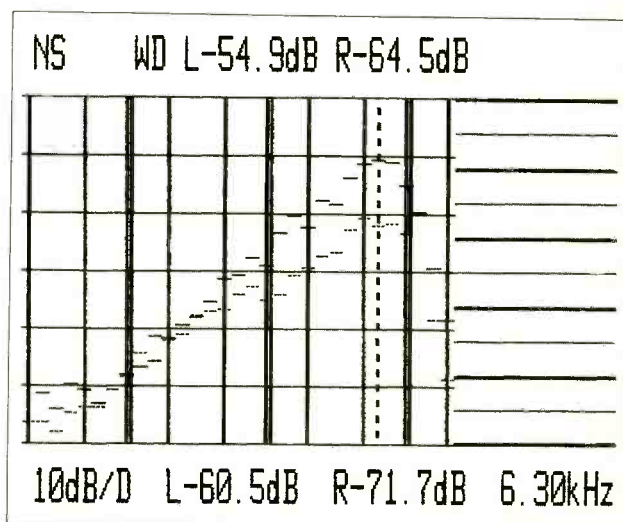


Fig. 8: Optonica RT-6605: S/N analysis with Dolby (R) and without Dolby (L) (Maxell UD-XLIIS).

figure) being the non-Dolby result. Note that for the metal tape (Fig. 9) results both with and without Dolby came very close to the S/N spec'd by the manufacturer. Since Optonica did not supply S/N figures for tape formulations other than metal, we cannot comment on the results obtained from the other two tapes except to say that they are about what we have come to expect from these tape formulations when they are used with well-designed and correctly biased decks.

Weighted wow-and-flutter (Fig. 10) measured better than claimed. Playback-only response was checked using the new BASF calibration tapes. For "Deck 1" (the playback portion) the results obtained are shown in Fig. 11. The upper trace is the left channel; the lower trace, the right channel. Vertical divisions are 10 dB. Reading from left to right, the double vertical lines represent 100 Hz, 200 Hz, 500 Hz, 2 kHz, 5 kHz and 20 kHz. The response here is quite flat up to 10 kHz, and is down at 15.5 kHz by

3 dB and 2.8 dB for left and right channels, respectively.

Figure 12 is a plot of speed accuracy (or, to be more correct, of deviations from speed accuracy for 180 seconds of operation). The deviation after 3 minutes was only 0.083 percent.

**General Info:** Dimensions are: 16 $\frac{3}{4}$  inches wide; 4 $\frac{1}{2}$  inches high; 12 inches deep. Weight is 16.5 lbs. Price: \$550.

**Individual Comment by N.E.:** An interesting variation in the seemingly never-ending variations of cassette deck design, the Optonica RT-6605 could appeal to the tape user who has a need for handy dubbing facilities but who has not [or cannot] acquired a second deck to do so. This may not exactly describe the advanced serious hobbyist or semi-pro, but it could apply to a lot of people who want to copy recorded cassettes for friends

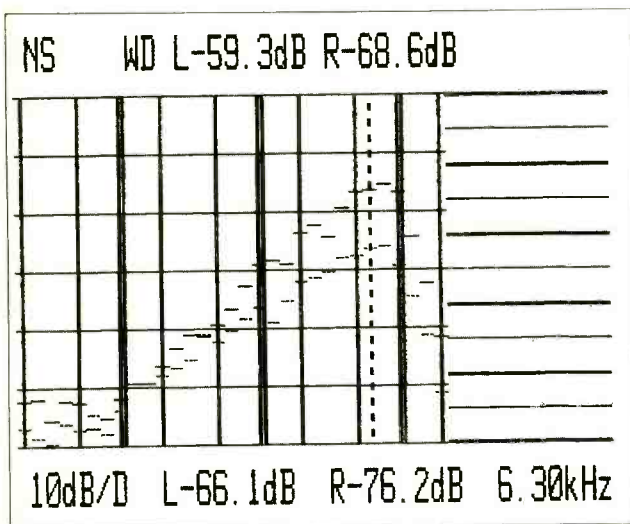


Fig. 9: Optonica RT-6605: S/N analysis with Dolby (R) and without Dolby (L) (Fuji metal tape).

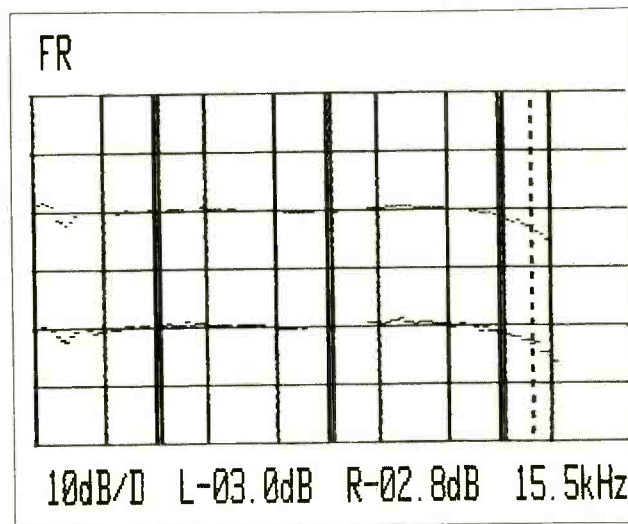


Fig. 11: Optonica RT-6605: Playback-only response, left and right channels.

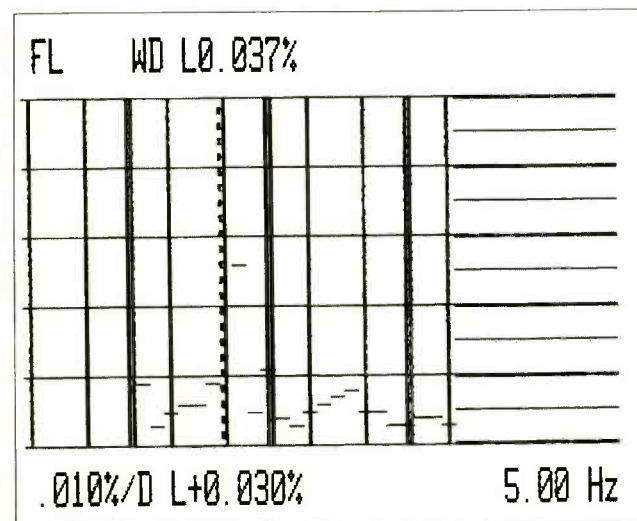


Fig. 10: Optonica RT-6605: Wow and flutter analysis. Weighting is WRMS. Major wow component is at 5 Hz.

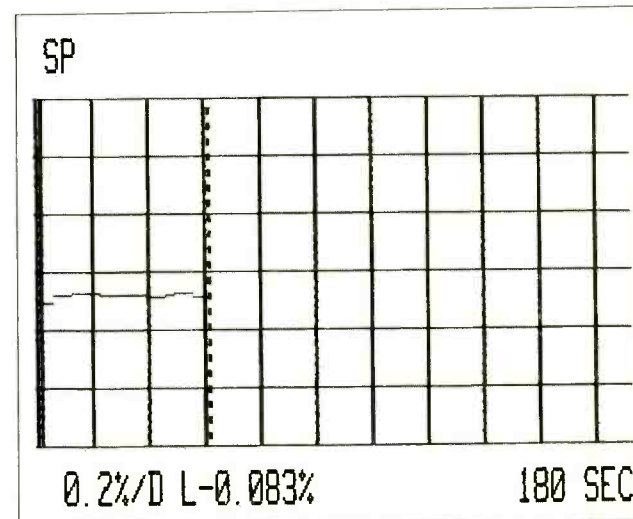


Fig. 12: Optonica RT-6605: Speed variation during first three minutes of operation.

or for their own additional use in car stereo systems (perhaps many might be reluctant to take too many original tapes along in a vehicle, but would be more willing to carry decently made copies while the original reposes safely at home). Optonica has made it easy to do just that with this machine and has managed to keep the price reasonable considering the double-duty facility. Of course, there are compromises evident in the RT-6605. It lacks a mic input; you cannot monitor off the tape while recording; it has an either/or input arrangement that precludes direct mixing (wouldn't it be fun to dub from a cassette and from another source at the same time?); and its performance with normal-bias tape is nothing to rave about, at least on our test sample. Still, it's a fairly unique machine that does its intended job very nicely, and it can put you into the "dubbing business" relatively painlessly.

**Individual Comment by L.F.:** When I first learned about the "twin compartment" cassette deck developed by Optonica (the idea has since been used by other cassette deck makers), I remarked to my colleagues that I thought this was a brilliant idea. After all, "everyone knows" that the optimum recording-head gap is not the optimum playback-head gap, and while—with great ef-

fort and ingenuity—several manufacturers have managed to cram separate record and play heads into the space originally intended only for a combination R/P head, some compromises are still necessary in such "three head" designs.

So, one would think that having the "freedom" to spread out into two separate compartments—one for recording and the other for playback—should yield truly superb performance for each. The performance achieved by the RT-6605 is good, of course, but not really better than that which we would expect from a "one hole" deck in the same price class, even one that crams three heads in the space intended for two. Of course, the RT-6605 does have three well-designed heads—the erase and record heads being in the recording compartment, and the playback head in the playback compartment. So the chief user benefit normally associated with a three-head machine—that of being able to monitor off the tape while recording—is lost to the user. It is as though I were dealing here with two cassette decks—one that records and the other that plays.

If your purpose is to do a lot of dubbing, this is a great machine for that purpose. But think about it—how much of your actual recording time is spent copying one tape to another?

#### OPTONICA RT-6605 CASSETTE RECORDER: Vital Statistics

PERFORMANCE CHARACTERISTIC	MANUFACTURER'S SPEC	LAB MEASUREMENT
Frequency response, $\pm 3$ dB,		
normal tape	30 Hz to 16 kHz	20 Hz to 13.5 kHz
hi-bias tape	30 Hz to 18 kHz	20 Hz to 18 kHz
metal tape	30 Hz to 20 kHz	20 Hz to 22 kHz
Signal-to-noise ratio, W/O Dolby,		
re 3% 3rd-order distortion record level		
normal tape	NA	54.6 dB
hi-bias tape	NA	54.9 dB
metal tape	60 dB	59.3 dB
Signal-to-noise ratio W/Dolby,		
re 3% 3rd-order distortion record level		
normal tape	NA	64 dB
hi-bias tape	NA	64.5 dB
metal tape	70 dB	68.6 dB
Record level for 3% 3rd-order distortion (0 dB = 200 nWb/m)		
normal tape	NA	+ 4 dB
hi-bias tape	NA	+ 3 dB
metal tape	NA	+ 5 dB
THD at 0 dB record level		
normal tape	NA	0.8%
hi-bias tape	NA	0.93%
metal tape	NA	0.85%
Line output at 0 dB	1000 mV	1000 mV
Headphone output at 0 dB	125 mV	118 mV (8 ohms)
Line input sensitivity for 0 dB	50 mV	72 mV
Wow-and-flutter (WRMS)	0.045%	0.037%
Speed accuracy	NA	- 0.083%
Fast-wind time, C-60	NA	Play, 104 seconds Record, 102 seconds
Power consumption	18 watts	23 watts

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# GROOVE VIEWS

Reviewed By:  
ROBERT HENSCHEN  
NAT HENTOFF  
JOE KLEE  
JEFF TAMARKIN  
NORMAN WEINSTEIN

## POPULAR

**CAROLE KING: *One To One*.** [Mark Hallman and Carole King, producers; Chet Himes and James Tuttle, engineers; recorded and mixed at Studio South in Austin, Texas and Kendun Studios in Burbank, California.] Atlantic SD 19334.

Performance: **Incredible no, credible yes**  
Recording: **Warm, familiar**

With Simon & Garfunkel reconciled, and Crosby, Stills & Nash back together, there may be a growing movement afoot to retrieve some great stars from the early '70s. Carole King certainly fits that description, and her new Atlantic album, *One To One* is being pushed as the stuff that dreams and big comebacks are made of.

What the record buying public may have forgotten is that Carole King didn't just cut *Tapestry* and then head for the hills of retirement...she's had other albums come out during the last ten years, all of which failed to recapture the popularity of yesteryear. You don't just crank out work the quality of "Will You Still Love Me Tomorrow" on an every day basis.

Still, that's more or less what King has attempted to do here. Her voice sounds like an old friend, and her songwriting style hasn't changed much either. *One To One's* tunes are finely crafted, and warmly produced,

but there's an element of old hat hanging over this new musical coiffure.

Half of those ten tunes contain something to write home about, and only a couple of them can stand with Carole's classics: "It's A War" and possibly "Life Without Love." The latter returns to the intimate piano and voice balladry that this lady will be remembered for, though it was written in part by a Goffin-King team which doesn't include Carole (Gerry Goffin and King's daughter Louise Goffin). Carole's own "It's A War" is the strongest cut on the LP, the only song here to put an edge on those famous little melodic hooks.

Other moderately pleasant moments on *One To One* include "Read Between The Lines," "One To One," "Someone You Never Met Before," and "Little



**CAROLE KING: A credible effort to reassure her diehard fans.**

Prince," but some of the music depends on recycled structural ideas as well as lyrics that appear to these ears as slightly timeworn.

Overall, *One To One* is a credible effort, actually better than anything else King has done since *Tapestry*. It's not what you'd call cause for excitement, but the album will no doubt serve to reassure some of Carole King's more diehard fans.

R.H.

**KARLA BONOFF: *Wild Heart Of The Young*.** [Kenny Edwards, producer; Jim Nipar, Jim Isaacson, Allan Blazek, engineers; recorded at Wilder Brothers Studios, Santa Barbara Sound, and Sunset Sound in California.] Columbia FC 37444.

Performance: **Subtle soulfulness**  
Recording: **Consistent richness**

It seems like every would-be record cutter is listening to oldies these days, scouring catalogs for those almost forgotten gems that can be polished up anew and turned into a money-making rehash. Produced here by "Remake Linda" Ronstadt's ace sideman Kenny Edwards, and already known as the writer behind some of Ronstadt's better first run tunes, Karla Bonoff is aware that old Motown and Memphis vaults will yield up some tremendous material. But she is a writer, and therefore she's gone one step beyond merely covering the classics...she's composing with those vaunted R&B hooks and rhythmic specifically in mind.

"I started listening to a lot of soul



music and R&B again," Bonoff explained recently, "...going back to some of my roots I'd left behind, my early teenage roots in Motown and AM radio." That mood, although musically understated, can be felt in originals like "Please Be The One" and "Gonna Be Mine," and also in Karla's choice of "Personally" (a 1978 R&B single released by Jackie Moore) for her opening track.

Then again, there is an unbroken connection between Karla's ballads ("Even If," "Dream") and her famous hits recorded by Ronstadt ("Lose Again," "Someone To Lay Down Beside Me"). Bonoff's melancholy cry comes through with plaintive clarity, reinforcing the point that she is as talented a singer as she is a writer. The title track is a poignant ballad, not unlike some of Jackson Browne's best stuff.

Of course, Bonoff is thoroughly schooled in the West Coast Method of record making, amassing J.D. Souther, Russ Kunkel, Andrew Gold, Danny Kortchmar, Bill Payne, Waddy Wachtel and other familiar names for this session. She's an L.A. veteran. Which brings up an interesting little sidelight...Karla once (1969) played in a four-piece California group called Bryndle, which also included Wendy Waldman, Andrew Gold, and this album's producer Kenny Edwards. A&M recorded an album by Bryndle that has sadly never been released, but the foursome sings together on this disc's "Even If."

*Wild Heart Of The Young* is only Karla Bonoff's third album in five years with Columbia. She's still not a household word, and mellow LPs aren't exactly dominating the charts these days. She has taken time to get things right, the sound is seasoned and rich, and those subtle soul influences do sound good. The writing isn't as immediately noteworthy as her 1977 debut material, but it's of a consistently high standard and easily palatable. R.H.

**PHIL MANZANERA: *Primitive Guitars*.** [Phil Manzanera, producer; Ian Little, Phil Manzanera, and Rhett Davies, engineers; recorded "in various working environments."] Editions E.G. EG-ED 14.

Performance: **Un-guitar experiments**  
Recording: **Fascinating and/or fuzzy**

With Phil Manzanera's *Primitive Guitars* we have an album that is scattered, inconsistent, sometimes dismally



**PHIL MANZANERA: Wringing an almost dumbfounding range of sounds from the guitar.**

recorded, and possibly—just possibly—a listening must for any self-respecting devotee of either progressive rock guitar or technical studio experimentation.

Phil Manzanera made a name for himself by playing electric guitar for one of England's more innovative pre-punk groups, Roxy Music. While leader Bryan Ferry and early keyboardist Brian Eno may have emerged from Roxy with greater notoriety, there is no question that Manzanera played an important role in pulling off musical concoctions that were both borrowed from and blatantly ignored established rock traditions.

Part of Manzanera's particular genius is that he has no style, or rather he has several, and constantly invents new ones. *Primitive Guitars* brings this point strikingly into focus. The nine tracks here, and even the noodlings heard between official "tracks," reveal an almost dumbfounding range of sounds that this man can wring from a guitar.

While the LP lacks logic, polish, and almost everything else associated with a normal studio effort (it doesn't even list recording locations in the liners), this is, in fact, the quintessence of a studio album. With the sole exception of John Wetton playing bass on "Europe 80-1," Manzanera has played all of the instruments on these tracks, painstakingly layering them during what must have been long hours spent in many studios. Even the snatches of conversation heard between songs lends an authentic studio aura to the proceedings...you feel

like you're a part of the process, just an informal listener.

The material itself is sometimes daringly different, sometimes slightly monotonous. Manzanera says in his notes that "among my abiding interests has been the possibility of making a guitar sound as unlike a guitar as possible." Which makes it difficult to determine where the guitar playing ends, and where support instrumentation (keyboards?) begins.

There are cuts like "Criollo" and "Big Dome" that build on rhythm machine motifs, adding effects atop the trancelike repetition. "Ritmo De Los Angeles" unveils more of a completed composition, and a hard rock guitar solo that is more easily identifiable. "Bogota" contains very bright acoustic guitar imagery and a folky kind of percussion, almost in a Pat Metheny/Nana Vasconcelos bag. "Europe 70-1" has a big, synthesized, orchestral sound and a spacy, ethereal section by the guitarist. "Impossible Guitar" heads off in a contrastingly primitive direction, which shouldn't surprise anyone considering the title of the album.

And so it goes. Every cut herein attempts something completely different, and there is obviously no intention to create a commercially successful recording. *Primitive Guitars* is an indulgence, an unfinished exploration of instrumental possibilities that musicians and engineers may find full of ideas, but which may not be appreciated by even Roxy Music's fans. R.H.

**VARIOUS ARTISTS: *Okeh Western Swing.*** [Original producers and engineers not listed; reissue compiled and produced by John Morthland and Michael Brooks; recorded at various studios in the United States; mastered at CBS Recording Studios, New York on the CBS DisComputer™.] Epic EG 37324.

**VARIOUS ARTISTS: *Okeh Jazz.*** [Original producers and engineers not listed; reissue compiled and produced by Bob Porter; recorded at various studios in the United States; mastered at CBS Recording Studios, New York on the CBS DisComputer™.] Epic EG 37315.

**VARIOUS ARTISTS: *Okeh Chicago Blues.*** [Original producers and engineers not listed; reissue compiled and produced by Michael Brooks and Jim Fishel; all tracks recorded in Chicago, II; mastered at CBS Recording Studios, New York on the CBS DisComputer™.] Epic EG 37318.

**VARIOUS ARTISTS: *Okeh Rhythm And Blues.*** [Original producers and engineers not listed; reissue compiled and produced by Joe McEwen with assistance from Gregg Geller; recorded at various studios in the United States; mastered at CBS Recording Studios, New York on the CBS DisComputer™.] Epic EG 37649.

**VARIOUS ARTISTS: *Okeh Soul.*** [Most tracks produced by Carl Davis; some with Davis and Sonny Sanders or Davis and Curtis Mayfield; reissue compiled and produced by Joe McEwen; most tracks recorded in Chicago, II.; mastered at CBS Recording Studios, New York on the CBS DisComputer™.] Epic EG 37321.

Performance: **All are historically worthwhile; most, musically vital**

Recording: **Range from 1920's and '30s scratchy to fine in the '50s and '60s**

The Okeh label was born following World War I and lived until 1969, and in that time it was responsible for quite a number of recording milestones. It was the first record company to record a black blues singer, it was Louis Armstrong's first label as a bandleader, and it recorded not one specific musical genre but all that were available.

This five-record set of double LPs

documents the Okeh label's output via samplings from the five most-recorded genres; Western Swing, Jazz, Blues, Rhythm and Blues and Soul. What is remarkable, besides the quality of the music itself and its historical value, is the obvious cross-breeding of styles: one can hear the influence of jazz on Western swing, feel the metamorphosis from blues to R&B to soul, until the styles nearly cease to have boundaries.

Through excellent liner notes, the history of the label is described on each sleeve in great detail; the label is put into perspective rather than emerging falsely as *the* most significant label of its era. While it was certainly one of the most important American recording industry cornerstones, Okeh only represented a part of a bigger picture, and that involvement is very accurately portrayed here.

*Okeh Western Swing* spans the years 1927-1950, and includes material by practically all of the prime exponents of that style, which ultimately gave way to country-western. The most important group in Western swing, Bob Wills and his Texas Playboys, is given a full side, documenting some of the prolific group's output from 1935-41. Wills, of course, had his own influences, but more importantly defined the shape of Western swing for all who followed him, and both pre- and post-Wills Western Swing is presented here.

It should be noted that the recording quality on these reissues varies from track to track and album to album, for the simple reasons that the level of recording expertise improved from the industry's infancy in the '20s through the final selections offered here (on the *Soul* set) in the '60s. Still, Epic, which has released these reissues, did a fine job of cleaning up the master recordings, and the music is always clear enough to decipher. Besides, the charm of these records would be lost if some of that rawness was polished up, and their historical importance best comes through with the original sound quality left nearly intact.

The lack of high fidelity might frustrate audio buffs as they listen to the early jazz and blues recordings on the *Okeh Jazz* and *Okeh Chicago Blues* sets, but one would be approaching these discs wrongly anyhow if one listened to them for sonic reasons alone. The *Jazz* from the late '40s and early '50s is more than adequately represented here, with material by Arnett Cobb, Ahmad Jamal and Red Rodney especially standing out. Jamal's

influential piano style is at its peak, Rodney's playing is inspired and additional material by Wild Bill Davis, Mary Ann McCall and Little Johnny Griffin (sax) adds up to give a good impression of the small band sound popular after World War II.

*Okeh Chicago Blues*, like the other sets, includes both previously issued and unissued material, but in this particular case, much of the tracks appeared first not on Okeh but on other CBS subsidiaries of the day, Vocalion and the then young Columbia label. From the earliest tracks, a distinctive blues styling emerges, but it's not until the final two sides of the set, featuring Muddy Waters, Johnny Shines, and Big Joe Williams, that a true Chicago-centered, urban blues form as we recognize it today is established. The earlier, more rural sounding blues by such artists as Roosevelt Sykes, Victoria Spivey, Memphis Minnie and Brownie McGhee, does serve to provide a link between the country blues of the early century with the hot, swinging Chicago blues of the latter.

By the '50s, Okeh was still strong, but had been joined by countless other labels, many independents, which captured the rising tide of "race music," or rhythm and blues, which had, by then, taken on as many stylistic variations as there were labels and geographic locations where the music flourished. Okeh's collection here is by no means a major document, in the league of Chess or Atlantic's R&B output, but is interesting nonetheless. Artists such as Chuck Willis, Johnnie Ray, and Screamin' Jay Hawkins are the best known, but equally earthy music was made by the others presented here on *Okeh Rhythm And Blues*.

Finally, *Okeh Soul* brings the label into the '60s, reissuing some of the major soul releases from the label's last years. Okeh was, again, not one of the most important soul labels, but it did provide an outlet for the underappreciated Chicago soul sound of such artists as Major Lance and Billy Butler and the Enchanters. The most important figure on this two-LP set is not even represented with any of his vast array of recorded music but instead by his songwriter: Curtis Mayfield. Mayfield wrote most of the material here, including all of the Lance hits ("Monkey Time," "Um, Um, Um, Um, Um, Um"), and what he didn't write himself he either co-wrote or left his mark on. Mayfield went on to front the Impressions and then go solo, but his role as a songwriter and sometimes

producer cannot be overemphasized.

These five sets are essential to any collection of American roots music. But in addition to providing historical information about America's music, they are commendable for the quality they offer. Many reissues are meager attempts to revive a musical slice of history for the purpose of cashing-in—this is an intelligently conceived and executed series that should serve as a guide for other labels considering exploring their vaults and providing a much needed service. But above all, this music still sounds vital and enjoyable, and that's the sign of truly timeless art. J.T.



**COUNT BASIE AND HIS ORCHESTRA:**  
*Warm Breeze.* [Norman Granz, producer; Angel Balestier and Dennis Sands, engineers; recorded at Group IV Studios, Hollywood, Ca., Sept. 1 and 2, 1981.] Pablo Today D2312131.

Performance: **The Basie Machine plus a couple of ringers ring the bell again**  
Recording: **Another digital masterpiece**

While the Basie Band, as a band, never flagged in its excitement and precision and swing...it has often been said of late that the solo spots aren't what they were in the days of Prez and Sweets. Well Prez is dead but Sweets came back to sweeten the band and Harry "Sweets" Edison can be heard on this LP playing Sam Nestico's original chart "How Sweet It Is." That is some kind of highlight but the rest of the album carries its share of the load as well. First of all there are still some fine players in the band, such as Booty Wood on trombone and Willie Cook on trumpet. Norman Granz' liner notes, however, err when they say that Willie Cook is the only musician, to the best of Granz' knowledge, who played with both the Count's and the Duke's big bands. To supplement Norman's knowledge, I will list only five of the most famous Basie/Ellington common alumni: Jimmy Forrest, Booty Wood, Paul Gonzales, Butch Ballard and Ernie Royal. I'm sure there are more but these are the first ones I came up with.

The soloists are listed in the liner notes (a great improvement for Basie records on Pablo), but one—Booty Wood—is eliminated from the listing on "After the Rain." That is, I presume it's Booty play-

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## THE DIZZY GILLESPIE FESTIVAL

By Nat Hentoff

If I were producing jazz albums again, most of them would be recorded "live." In any music, but especially in jazz, the direct communication between player and listener heightens the performance. As practically any jazz musician will tell you, the kinds of reactions he gets from an audience cannot help but shape the way he plays and, to some extent, what he plays. Even if the audience is cold, that in itself becomes a challenge as the player tries to thaw the listeners.

Of all jazz musicians, Dizzy Gillespie most enjoys interacting with a crowd. I've heard him in all sorts of situations and while he never coasts anywhere, Dizzy positively glows in a club or concert setting. As, for example, in *Dizzy Gillespie Plays and Raps in His Greatest Concert* (Pablo Live, two volumes).

The place was the Montreux, Switzerland, Jazz Festival in July, 1981; and Dizzy's associates were vibist Milt Jackson, James Moody on reeds, bassist Mike Howell, George Hughes on drums, and Ed Cherry on guitar. From such vintage Gillespie fireworks as "Con Alma" and "Night in Tunisia" to a deeply lyrical tribute to Martin Luther King, "Brother King," Dizzy is in complete command of his horn and the audience.

There is also, as the title of the album indicates, a fair amount of Dizzy's conversational asides to the audience—pungent, amiable, sometimes sly, always sharply astute. The recorded sound is first-class—vibrant, crisp, but also sounding deep and full.

The second "live" Dizzy Gillespie festival is a three-record set made up of three concerts in which he appeared, from 1970 to 1980, with pianist Dwiki Mitchell and Willie

Ruff, a bassist who doubles on French horn. The settings are Dartmouth, Yale, and New York's Town Hall.

Hearing Dizzy with just a duo illuminates his tremendous rhythmic force and flexibility. I would hope that Dizzy, now at the height of his powers, may try a solo album. This approach to recording has become a familiar one for some of the younger avant-gardists, but there's no reason why we can't also hear so *total* a musician as Dizzy in this hugely demanding context.

In any case, his playing with Ruff and Mitchell is even more relaxed than is customary with Dizzy, and thereby somewhat more reflective in places. In addition to his own numbers, and some originals by Ruff, Dizzy brings unexpected dimensions to Billy Strayhorn's "Lush Life" and Duke Ellington's "Mood Indigo." Two particularly compelling performances are based on marvelously melodic standards by Benny Golson—"I Remember Clifford" and "Whisper Not."

The engineering is well-balanced and persistently attentive to Dizzy's continual surprises. *Dizzy Gillespie-Live with the Mitchell-Ruff Duo* is released by Book-of-the-Month Records, but you don't have to be a member of that club to buy it. (\$22.95 plus \$1.75 for shipping and handling from Book-of-the-Month Records, Camp Hill, Pennsylvania 17012.)

**DIZZY GILLESPIE: *Plays and Raps in His Greatest Concert.*** [Dizzy Gillespie, producer; David Richards, engineer.] Pablo Live D2620116.

**DIZZY GILLESPIE: *Live With the Mitchell-Ruff Duo.*** [No information on producer or engineer.] Book-of-the-Month Records 31-6515.

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ing there. It sure sounds like him. Another trombonist, Dennis Wilson, solos nicely on "C.B. Express" and Willie Cook shines through on both "Cookie" and "Satin Doll." The latter also provides the most exciting playing I've ever heard from current Basie tenor star, Kenny Hing, and an excellent solo from Count Wilhelm Von Basie himself. Of course Sweets Edison never changes. He sounds just as good as he used to when Basie's band was young and green and fresh out of Kansas City.

The digital recording that Granz and his engineers achieve in the studio never ceases to amaze me, especially when contrasted with some of the sad results that they've gotten on tour, in Montreux for example. One could not ask for cleaner, clearer reproduction than Basie's band gets on this disc.

Perhaps the most disappointing thing about this LP is that the greatest jewel of the Basie crown—the rhythm section—is at less than its best. Sure the Count is still at the piano and while his ill-health may have robbed him of some of his stamina he can still deliver as he does here on "Satin Doll" and Freddie Green is still on guitar although he's been better recorded on other occasions. While Cleveland Eaton is not the best bassist I've ever heard in Basie's band he's still good enough to keep it moving. The problem is that neither Gregg Field nor Harold Jones who split the drum chores on this album can come within shoutin' distance of Butch Miles. They bash about nervously and noisily here and there but neither has the ability to get behind this band and propel the way Butch did.

Lester Young is dead. Butch Miles is playing with Bob Wilber's band. Still the Basie Machine swings on forever. Maybe this year's model isn't quite as good as last year's model. Maybe next year's model will be better. Still the Basie band of any year outdistances its meager competition by a long way. J.K.

**FRANK LOWE: *Skizoke*.** [Bob Rusch, producer; Mark Beachan, engineer; recorded at Soundscape, New York, N.Y., March 1981.] Cadence Jazz Records CJR 1007.

Performance: **Full of spark and shazam!**

Recording: **Lamentably lame**

"Skizoke" is jazz slang for that moment when improvised music begins to gel. Frank Lowe's album wonderfully lives up to the claim of its title. His tenor

sax positively sizzles with imaginative runs. And none of his previous recordings prepared me for so listenable a session. For the Frank Lowe I knew cut his musical eye teeth playing with the avant-garde ensembles of Alice Coltrane and Sun-Ra. The man could provide shrill shrieks and grating honks—but mellow melodies within a mainstream jazz context?

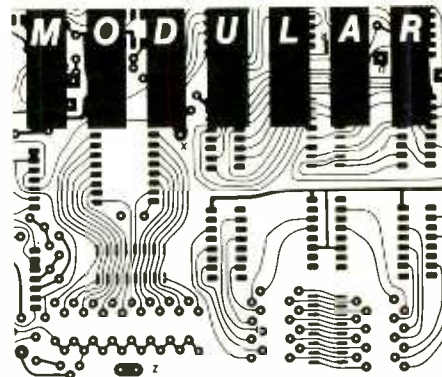
*Skizoke* has its share of gorgeous melodies. Lowe and cornet player Butch Morris establish an empathic working relationship from the opening notes of the session. Their choruses on the title cut are muscular excursions featuring experimental horn work within the context of a Monk-like composition. Lowe's tenor playing has a wholly individual sound. He uses unconventional phrasings and can create sounds one would identify with a trumpet more than with a tenor sax. He refuses to sound like anyone's clone.

Consider his version of Ornette Coleman's "Sortie." Lowe and Morris resist the temptation to imitate the original Ornette Coleman/Don Cherry sound and turn the song into an energetic romp. And let's not neglect the contributions made by Lowe's other band members. Guitarist Larry Simon and vibesman Damon Choice punctuate every number with surprising and shimmering bursts of tonal color. Bassist Wilbur Morris and drummer Tim Pleasant provide a churning and steady bottom for Lowe and friends. This was a session where everything was cooking—almost.

Four out of the five cuts on *Skizoke* are medium tempo affairs that flow gracefully. The album's final cut, "Close to the Soul," is a dirge-like blues number that seems to drag interminably. Drummer Tim Pleasant seems confused as to what to play next. Larry Simon contributes a tight guitar solo that seems out of phase with the other players. This cut is Lowe's only real low of the record so this mess can easily be forgiven. *Skizoke* is an entertaining and challenging recording well worth the attention of any serious jazz buff.

But audiophiles better listen to *Skizoke* when their blood pressures are low. Let's hit the good old *Roget's* for adjectives to describe recording quality. Dank? Vague? Cloudy? Maybe it's simile and metaphor time. Tim Pleasant's drums are so ineptly recorded that they sound like twenty gallon Sears trash cans hitting a hard pavement at dawn. Wilbur Morris' bass sounds like it was recorded *behind* a ten foot wall of cotton balls. There is simply no excuse

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for such a brackish sound. The Frank Lowe Sextet is a quality band. I wouldn't lavish this quality of studio sound on the kids on my block playing "Louie, Louie." Let's hope that Lowe's next session receives the clarity a musician of his depth and drive deserves.

This record might not be found at your favorite record store. Write to Cadence Jazz Records, Cadence Magazine, Cadence Building, Redwood, N.Y. 13679 for ordering information. N.W.

**CHAKA KHAN: *Echoes Of An Era.***  
[Lenny White, producer; Bernie Kirsch, Duncan Aldrich, engineers; recorded at Mad Hatter Studios (location unknown).] Elektra EI-60021.

Performance: **Classic jazz**  
Recording: **Vintage stuff**

Chaka Khan's *What Cha' Gonna Do For Me* album on Warner Bros. last year should have been a tipoff. Produced by Arif Mardin, it jazzed up Chaka's usual funky offerings with cuts like "Night In Tunisia" and guest appearances by Dizzy Gillespie, Herbie Hancock, the Brecker Brothers, and other hip heavyweights.

But *Echoes Of An Era* is something else. Accompanied by a quintet starring Freddie Hubbard (trumpet), Chick Corea (piano), Joe Henderson (tenor sax), Stanley Clarke (acoustic bass only) and producer Lenny White (drums), Khan confines herself to mainstream

jazz standards, and by doing so reveals a whole new side of her talent.

Few would contest Chaka's vocal range or ability based on her respected funk-rock career, but her emotive and interpretive savvy on this kind of material still comes as a shock. The fact that noteworthy improvisation is going on here is substantiated by two totally different takes of "All Of Me," one on each side (and both versions nearly five minutes long).

With Corea handling the arrangements, and all five musicians cooking straight ahead with frequency and fine soloing by all, Khan tackles "Them There Eyes" right off, and then moves gamely through a wide diversity of classics. "I Love You Porgy" gets wrapped in a beautiful vocal package by Chaka, who demonstrates great sensitivity on material that is at least a few decades her senior. "I Hear Music," "All Of Me," and "Spring Can Really Hang You Up The Most" really swing, not only on the merits of an excellent backup band, but on some mighty ambitious singing. Chaka's self-penned liner notes indicate that she's aware of Sarah Vaughan, and her jazz style indicates that she's aware of Sarah, Carmen, Ella, and a lot more. "Take The 'A' Train" and "I Mean You" (by Thelonious Monk and Coleman Hawkins) get into ruthless grooves that rival even their more famous renditions.

Credit for this quality session should go to producer Lenny White and his



**CHAKA KHAN: Exposing a noteworthy emotional and interpretive savvy.**

crew for doing an uncompromisingly good job. But another kudo is due to a man behind the scenes at Elektra, Bruce Lundvall. *Echoes Of An Era* kicks off what Lundvall hopes will be the dawn of an era for his new Elektra Musician all-jazz label. Even as this review is being written, Musician has come out with its first wave of awesome releases by: Charlie Parker (previously unreleased live material), Lee Ritenour, Freddie Hubbard, Eric Gale, Red Rodney/Ira Sullivan, Material, John McLaughlin (a reissue of the out-of-print *My Goal's Beyond*), and The Griffith Park Collection (instrumental cuts by the Corea-Hubbard-Henderson-Clarke-White quintet that plays on *Echoes Of An Era*). There's really not a throwaway in the bunch.

R.H.

**ROVA SAXOPHONE QUARTET: *As Was*.**

[Larry Ochs and Henry Kaiser, producers; Bob Shumaker, engineer; recorded at 1750 Arch Street Studios, Berkeley, Ca.] Metalanguage Records 118.

Performance: **Wildly daring ensemble escapades**

Recording: **Full bodied**

Listening to experimental sax playing for any length of time requires an exceptional openness on the listener's part to potentially annoying squeals and honks. Ornette Coleman was once beaten up by an angry jazz crowd while performing his iconoclastic music on a plastic sax. For every thousand record listeners who cherish the "melt-in-your-mouth" mellowness of a John Klemmer or Grover Washington, there are a handful of listeners who appreciate the shrieking blasts of an Archie Shepp or David Murray. Perhaps the greatest obstacle for novice listeners of experimental sax is the unstoppable desire for hearing meaningful *form*. Anyone with a sax and a lack of inhibition can publicly perform a spectrum of bizarre sounding notes on a sax. Few musicians are imaginative innovators who cause us to really rethink the structure of jazz sax music.

In the Rova Saxophone Quartet are dazzling and demanding musicians whose group improvisations have opened my ears to a new universe of revolutionary music. Each of the four plays a variety of saxophones, flutes and clarinets and does so with fiery authority. But I'm even more impressed by their collective interplay. Only the sub-

tle and unexpected saxophone counterpointings of Roscoe Mitchell and Joseph Jarman of the famed Art Ensemble of Chicago are in the same musical class as these players.

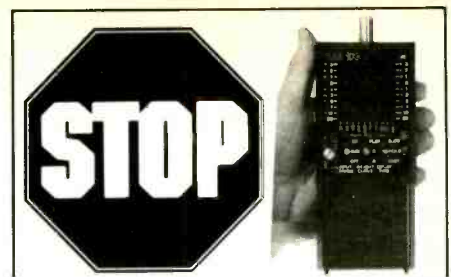
Consider "Paint Another Take of the Shootpop," the longest cut on *As Was*. Tenor sax Larry Ochs begins the composition with a quivering vibrant solo that serves as an "overture" of the twenty minutes of ensemble play that follows. Jon Raskin contributes a staggeringly powerful honking solo midway through the piece while Andrew Voigt and Bruce Ackley contribute highly energetic soprano sax and soprano work. The horns trade off solos so rapidly and economically that this listener had difficulty distinguishing who was playing what for some of the piece. A motif in both this cut and others on *As Was* involves one horn doing solo duties while the others "foil" the solo player by playing opposing sounds in tandem.

This sounds tremendously complicated and technical and complexly conceptual—which it is. The Rova Saxophone's music is ideal brain food for intellectual jazz listeners who love to puzzle out microstructures and counterepoised fields of improvised sound.

But that's not why I happen to love this recording.

*As Was* is filled with music capable of evoking humor, melancholy, or ecstasy. The album closes with a three minute jewel entitled "Daredevil." Larry Ochs wryly notes in his extensive and clarifying liner notes that the tune is "for the benefit of Mr. Kite." Alert rock fans will quickly recognize the allusion to the Beatles song about circus shows. And that's what "Daredevils" evokes. Four saxophones paint the most charming and compelling image of a circus. The Rova Saxophone Quartet is a four ring circus of cacophonous horns blending traditional horn styles with new, mixing fixed music structures with wildly free improvisation. Their group musical experiments warrant our most serious (and mirthful?) attention.

The production by Henry Kaiser and Larry Ochs is as exceptional as the music. The elaborate interplay of extreme sax pitches offered by this ensemble is captured in a full bodied and clean sound. I have noticed a number of experimental music groups in California recording recently at 1750 Arch Studios in Berkeley and have appreciated the dry and clear ambience of new music recordings made there. Metalanguage Records also has its home in those fair radical hills. They are quite a tiny com-



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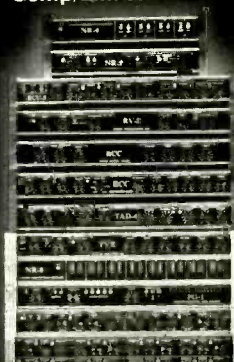


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pany that specializes in quality pressings of experimental music—a quixotic and noble activity that I really think deserves support.

Charles Ives once told a critic of new music: “Stand up and use your ears like a man!” I’d like to imagine him at the recording studio producing Rova’s next new blockbuster. N.W.

## CLASSICAL

**BEETHOVEN: *Symphony No. 3 in E Flat, “Eroica.”*** The New York Philharmonic, Zubin Mehta, cond. [David Motley, producer; Bud Graham, engineer; recorded at Avery Fisher Hall, Lincoln Center, New York, N.Y., March and April 1980.] CBS Masterworks 35883.

**BEETHOVEN: *Symphony No. 3 in E Flat, “Eroica.”*** The Philadelphia Symphony Orchestra, Eugene Ormandy, cond. [Jay David Saks, producer, Paul Goodman, engineer; recorded at the Scottish Rite Cathedral, Philadelphia, Pa., Sept. 29, 1980.] RCA ATC1-4032.

Performances: **Two different “Eroicas”**  
Recordings: **Two different digitals**

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One would think with Mehta’s penchant for the quick, the loud, the spectacular that he would be the one to run the work into the ground with effects and yet to my surprise his tempi are nearly within seconds of Toscanini’s classic reading of this symphony in all but the first movement (in which Mehta’s performance takes 4 and one half minutes longer than Maestro

Toscanini’s). Yet the stop watch does not always tell the difference. A close listening to Toscanini, Ormandy and Mehta in the opening phrases of this symphony show them to be very close together. A lot of the time discrepancy is a matter of how religiously the conductor observes the repeats, which are frequently omitted in Beethoven’s symphonies.

Mehta’s version seems to me to be much inspired by Toscanini’s. When you have the kind of virtuoso orchestra that Mehta has, this kind of interpretive fireworks work quite well. Yet I would point out that sections of the final movement where there is a restatement of the theme by the woodwinds that surpasses even Ormandy’s somewhat slower version for clarity.

Ormandy’s version of this symphony may be a bit closer to what the average listener is used to, except for the fact he takes the first movement quicker than the average and the second movement (the famous funeral march) slower than the average, thereby achieving an even more dramatic contrast than usual.

That’s the reason for two digital “Eroicas.” I don’t know if I’ll feel that way a few years from now by which time Solti, Karajan, Bernstein and maybe Levine will have swelled the ranks, but so long as a conductor has enough interpretive genius to give me a different view of Beethoven, I’ll not complain regardless of however crowded the catalog may be with multiple renditions. J.K.

**TCHAIKOVSKY: *Piano Trio in A Minor, Opus 50.*** Mikhail Pletnyov, piano; Elmar Oliveira, violin; Nathaniel Rosen, cello. [Andrew Kazdin, producer; Bud Graham, Arthur Kendy and Ray Moore, engineers; recorded at CBS Studios, New York, N.Y., 1980.] CBS Masterworks 35855.

Performance: **Masters of chamber music playing a masterpiece**

Recording: **A bit too brittle for my taste, otherwise excellent**

Generally the public tends to think of Tchaikovsky in terms of orchestral brilliance: the symphonies, the ballets, the concerti. That certainly is one formidable aspect of Tchaikovsky’s genius which cannot be ignored, but there is something in the still small voices of his chamber music. Tchaikovsky did leave us a wealth of several quartets for strings, pieces for other groups of in-

struments and this magnificent piano trio. The circumstances surrounding the work and its posthumous dedication to the memory of Nicholas Rubinstein are detailed in the sparse but informative liner notes by Phillip Ramey which cover barely one third of the space on the back cover of the album.

The music is exquisite, superbly played but a little strange. At first I was wondering if pianist Mikhail Pletnyov was guilty of trying to upstage his partners but a quick reference to a previous recording and a few more careful listenings to the work show that Tchaikovsky conceived of this work as a keyboard dominated score (the dedication to Nicholas Rubinstein would alone be enough to justify such a move). The effect is heightened by a recording balance which favors the piano without slighting the other players. This would seem to be well in keeping both with the composer’s intentions and with the way the piece works to best advantage. I do find the piano recording a bit hard at times but everything does come through clean, clear and well balanced.

This brings us to the question of chamber music and why the piano trio of Tchaikovsky is less well known than the classic ballets, the piano concerto, the 1812 Overture, the violin concerto and the last three symphonies. Chamber music was originally intended for home performance whether by professional musicians or amateurs of professional quality. When string quartets and piano trios moved into the concert hall it was originally into smaller halls of the size and acoustic that would give the music more accessibility without losing the intimacy of the music or swamping the ensemble in the vast spaciousness of an Avery Fisher Hall or a Carnegie Hall. What the phonograph in general, the LP record in particular, has done for this music is to put it back into the proper perspective. Whereas in the 1800’s it would be necessary to engage three top notch artists to come and play for you and your guests in your living room, today the great artists of the world can respond to your invitation “recordially” (excuse the pun please).

The three artists involved here are not yet household names although they have been heard around the concert scene lately (Oliveira especially in the New York area). It is important that CBS Masterworks is giving exposure to this new generation of concert artists. They will one day occupy the voids that will be left as the Sterns and Serkins approach retirement. J.K.





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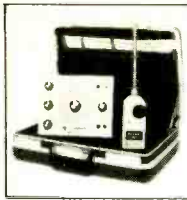
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*Ms. Ciani, principal of Ciani Musica, Inc., a New York-based production company, is soon to release her first original electronic album, "New Waves" on the Victor Musical Industries label. She holds a Master's Degree in music composition and has been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

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