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Stones Engineer

MODERN

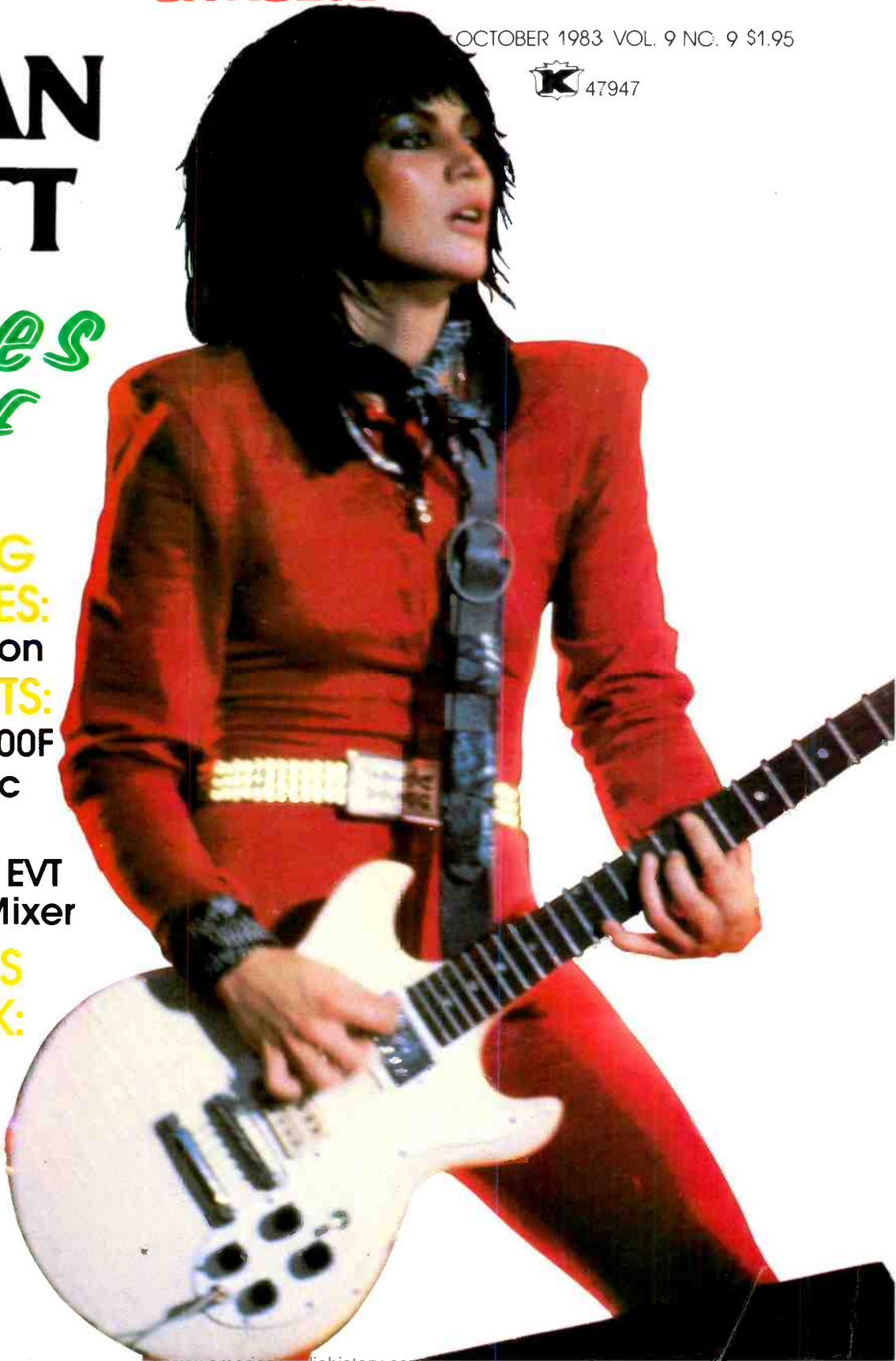
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& MUSIC

OCTOBER 1983 VOL. 9 NO. 9 \$1.95



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MODERN RECORDING & MUSIC

FEATURES

9 RECORDING TECHNIQUES

by Bruce Bartlett

Ready to do that "live" recording? You better make sure you know how to prevent hum and buzz problems. In this issue Mr. Bartlett explains several grounding and shielding techniques to keep your sound clean.

25 CRITERIA'S MACK EMERMAN

by Ken Pohlmann

Criteria Recording Studios' owner Mack Emerman began recording as a hobby. Today his studio is one of the most prestigious complexes in the country.

34 JOAN JETT TAKES OFF

by Ellen Zoe Golden

Joan Jett has come a long way since the days of her first rock 'n' roll band. Lately, Joan's been taking an even more active role in the production of her albums. She and manager Kenny Laguna took some time out to speak to *MR&M* about their recording process.

46 A SESSION WITH CHRIS KIMSEY

by Rob Patterson

Who is he? Engineer-producer Chris Kimsey has created sounds for such greats as the Stones, Mott the Hoople, Peter Tosh, and Jimmy Cliff. *MR&M* took some time to speak to him about his work on the last three Stones albums.

50 BOOK REVIEW

by Ken Pohlmann

The book is *Critical Listening: An Audio Training Course*. The review evaluates an out of the classroom instruction kit designed to develop good listening acuity.



DEPARTMENTS

LETTERS TO THE EDITOR

TALKBACK

The technical Q and A scene.

¼ NOTES

New and Noteworthy events in the recording industry.

THE MARKETPLACE

What's new in sound and music.

& MUSIC

Review of albums by Ron Carter, Jane Ira Bloom, and Peter Tosh.

AD INDEX

SOUND IDEAS

MUSICIANS NOTEBOOK

by Craig Anderton

An evaluation of the DeltaLab Echo-tron delay line.

STUDIO NOTEBOOK

by James F. Rupert

In this installment, Mr. Rupert discusses the advantages and disadvantages of buying and leasing property for that studio of yours.

AMBIENT SOUND

by Len Feldman

Our roving reporter returns from yet another trip! This time he's been at the summer CES show in Chicago and has come back with news of some of the new equipment in the audio industry.

LAB REPORT

by Len Feldman

Denon's DN-3000F Compact Disc Player.

Electro-Voice EVT 5212 Tapco Stereo Mixer.

6

45

54

72

80

20

52

60

62

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Joan Jett Photos: Courtesy of Howard Bloom organization



Making *MR&M* Great(er), Part 2

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In our June Letters section, reader Michael R. Kristofic suggested that we prepare an index of all articles and equipment reviews that have appeared in *MR&M*. He wrote, "... suppose I'm in the market for a power amp. Now, which issues had reviews of power amps? I'm forced to leaf through tables of contents—a dull way to spend the evening."

Make that "a dull way to spend many evenings." We should know. We've just finished going through every #!#** issue since the year 1. (Actually, the year was 1975.)

Did you know that *MR&M* has reviewed almost 400 items since then? This includes, by the way, 54 power amplifiers, starting with the Harmon Kardon Citation 16 (April 1976) and ending (for the moment) with the Phase Linear Pro 700 (April, 1983). Along the way, we've gone to sessions with just about everybody, and done profiles on almost everybody else. As for feature articles, there have been hundreds.

All of this information has been compiled in two indexes. One lists all the equipment reviews; the other one covers the features, plus Len Feldman's Ambient Sound, and Notes by Craig Anderton and Rick Chinn. (Equipment covered in the Notes column is found in the Reviews Index.)

Now that we're done, the list is being checked and prepared for printing. The Features index will be in three sections, labeled Author, Category, and Title. The Title index will list every artist, engineer or producer who has been the subject of a Profile, Interview or "Session with..." feature.

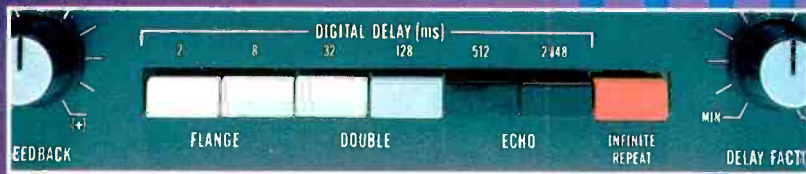
As for the equipment reviews, there will be two sections. One will be alphabetically by manufacturer, and the other will be by equipment category (that's how come we know there are 54 power amps out there).

Since from now on the list will now be updated monthly, it will simply be printed on regular 8½ by 11 sheets of paper. This will keep printing and mailing costs within reason, and allow us to keep the list continually up-to-date.

If you've been reading between the lines, you've probably guessed that we've done all this by computer. (Otherwise, we'd still be at it.) Our computer program will sort the list just about any way you can imagine, and, if you like, will display only reviews of noise reduction systems or, say, of tape recorders made by Studer—or whatever other combination you can dream up. As for the feature articles, if you want a listing of everything written by Len Feldman, there's nothing to it. You can also find all authors whose last names begin with 'An' (Anderton, Angus & Anthony). And it won't take all evening. Each sort takes about two seconds.

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Talk Back

Phantom of the Mixes

I've been considering the purchase of an external phantom power supply to use with my Teac model 5B mixer. It has occurred to me that I may be able to modify my board and have all eight channels hot for about the same cost as an external unit to power just a few microphones.

I'm certain this modification could be made by a lot of semi-pro studio owners, and be done for a reasonable cost. The Teac board may be easier than most others, since all the modules simply lift out. Can you cover this in your magazine?

—Jeff Liford
Toledo, Ohio

Teac's Meryn Morgan replies:

The possibility and desirability of adding a phantom power system to our model 5 mixer has been discussed at Teac in some length. Many studios—even personal-use studios—can benefit from having phantom power available at each input. In the October, 1980, Talkback column, the necessary modifications were described in detail.

The drawing seen here is taken from a Teac service bulletin for the models 15, 15B and 16 Tascam consoles. Adding these components and wiring to the rear panel (inside, of course) of the model 5 should suffice. The service bulletin contains the following notes:

1. To prevent possible damage to older or delicate non-phantom microphones, use an on/off switch at each microphone connector.
2. AKG C451 microphones will be quieter in circuit noise if the resistor values are closely matched. Close

matches may be made from bulk-packaged non-precision resistors, by hand-selecting the resistors using a digital multi-meter.

3. For maintaining a very close pair-match, cement the two resistors together in a blob of epoxy for improved thermal tracking.

4. 48-volt power supplies are available from many sources (for example, model HB48-0.5 from Power-One, Camarillo, CA 93010). Under worst-case conditions, the most current needed will be 10 mA for each microphone.

5. Physical modifications to any Tascam or Teac product will void all associated warranty claims.

The Equalization Debate

In your June Talkback section, reader Robert W. Gray pointed out that equalizers are best used during the recording process. You advised against this technique, citing the danger of tape overload due to recording an equalized (that is, boosted) signal. You also pointed out the potential inconvenience of being stuck with an inappropriately equalized signal. Here are some of my feelings on the matter.

1. Mr. Gray is right in equalizing as he records. Doing it later means equalizing noise as well, and that can really be a problem if one needs more treble, because there's usually lots of noise up there.
2. The danger of overloading the tape is easily eliminated if you just turn down the overall signal level before it gets to the recorder.
3. Being stuck with a badly equalized signal is seldom any worse

than being stuck with a signal that needed equalization in the first place. Anyway, you can always re-equalize in the mix if you need to.

4. When time-sharing a track, mixing is much easier if the sounds on the track were recorded as they should eventually sound. This eliminates frantic changes from one instrument to another during the mix.

5. Most of us don't have all the out-board gear we need, so using an equalizer during recording frees it for other uses during the mix, effectively doubling your signal-processing power.

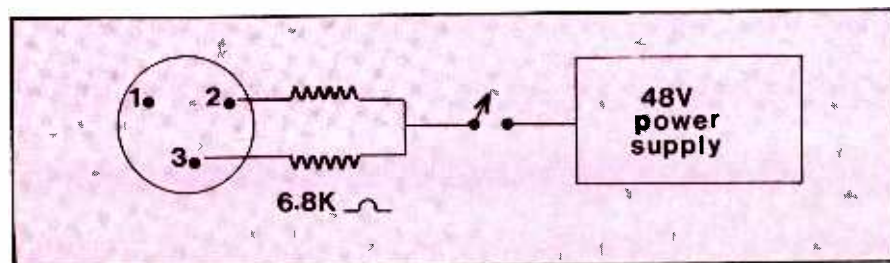
I understand that taping this way requires the foresight to imagine the proper sound for an instrument while still laying basic tracks, and this can be hard to do when most of the other instruments haven't been recorded yet. Still, I think it's a good way to get the most out of your gear, and make your tapes fuller and cleaner. Thanks for listening.

—Mark Lemaire,
Euphoria Sound Studio
Revere, Massachusetts

We'll meet you half way on this. If you know exactly what you'll want to hear later on, and if you make sure you watch your recording levels closely, then adding some record equalization should not cause any problem. However, when listening to a single track out-of-context, it's very difficult to make equalization decisions that will still hold up during the mix. Not impossible—just difficult.

We'd rather try different mic placements, or a different mic entirely, or possibly make an adjustment to the instrument being recorded. Those kinds of changes often sound a lot better and "cleaner" than reaching for a knob on the equalizer.

In short, there is no "correct" way to use an equalizer. We'd just like to caution everyone to approach those knobs with care—especially during recording. Stick around for more details. We've got an Equalization feature in the works.



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In the world of digital signal processors there is a fine line between processors that are "loaded" with features and those that are truly useful processing tools. Carefully designed signal processors have features and functions that are designed to work with each other logically and efficiently. This makes the digital processor easier to understand, to control, and ultimately to integrate into live musical situations.

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Recording Techniques

by bruce bartlett

You're recording a rock group on-location. You run your mic cables, plug in a few direct boxes, bring up the monitor level and there it is—hum! What can you do about it?

There are all sorts of quick fixes for hum and buzz problems—replacing broken cables, rerouting cables, flipping ground-lift switches on direct boxes, and so on. But it's best to prevent hum in the first place by following good wiring practice. This article will explain several grounding and shielding techniques to keep your audio clean.

AC Power Wiring

Hum prevention starts with properly designed power wiring. Sound system equipment should be powered on its own circuit; separate from lighting, air-conditioners, etc., which can put noise spikes on the AC line. Ideally, the audio system is powered

from its own power transformer (on a telephone pole outside the studio). The second choice is to get power from an independent breaker box; the third choice is to put the audio system on a different phase of the incoming AC mains than other equipment is connected to. The last choice is to power the audio from its own circuit breaker. In any case, all the audio equipment (including guitar amps in the studio or on stage) should be on the *same* phase of the power line to prevent hum.

It helps to use isolation transformers between the AC power outlets and the audio equipment power cords. These transformers remove radio-frequency interference on the AC line generated by lighting, computers, motors, and other sources.

Avoid fluorescent lights in the studio because they radiate strong magnetic hum fields. If fluorescent lights can't be removed, be sure the

lighting fixtures are grounded, and replace faulty ballasts. Install a noise filter inside each fixture. Also avoid SCR dimmers—they put "hash" and buzzes on the AC line. Instead, use multi-way incandescent bulbs to vary the studio lighting levels.

Enclose the power wiring in grounded metal conduit to prevent hum radiation from the power lines into audio circuits.

Buzzes in sound reinforcement systems are usually caused by interference from stage lighting circuits. Use isolation transformers or line filters, and keep lighting cables (and power wiring) well away from audio cables. If these cables must cross, cross them at right angles and separate them vertically.

Earth Ground

Once you've established a clean power feed, you should set up a solid grounding system. The purpose of grounding is to establish zero potential difference between any two metallic surfaces in the studio, and to make them all zero potential with respect to earth ground. Grounding also protects people from AC shorts to chassis, and provides a drain path for shield charges.

You can't always trust the wall-outlet grounds to have a low-resistance connection to earth ground. It's best to install your own earth ground by driving an eight-foot copper rod or pipe into moist earth outside the studio. Bolt or strap a heavy stranded cable to it (#2 or larger). In high RF areas, use a copper strap or braid 4 to 12 inches wide and as short as possible. Run this cable or strap up to the console ground bus (a terminal or plate). Securely bolt or solder the cable to the ground bus. The entire ground system should be very low resistance because it carries heavy currents from all the audio shields.

An alternative earth ground is a metallic cold-water pipe (copper pipe is preferable to steel). Securely bond the ground wire to the pipe with a pipe clamp (available at hardware stores). A ground stake is preferable to a cold-water pipe, because the pipe may act as an RF antenna and introduce switching transients from

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lighting and motors into the sound system.

In less critical applications, the ground plate in a circuit-breaker box will do, because it is connected to the power company's earth ground. This power ground may still carry noise spikes and heavy currents.

In small studios with fewer than 20 power cords in use, the wall-outlet ground is usually adequate. Plug the console into a three-wire grounded outlet, and plug the other equipment into AC outlet strips. Note: In many homes or buildings with older wiring, there is no 3rd-wire power ground. In this case, you'll have to ground to a cold-water pipe or ground stake.

Ground Wiring for Pro Installations

AC outlets with modern wiring contain three wires: hot (black), neutral (white), and ground (bare or green). The ground wire connects back to the power company's earth ground, and establishes a *power ground* or *safety ground*. Many electronic devices have three-wire power cords; the round ground pin on the cord connects the equipment chassis to safety ground. Should a short occur between the hot power line and the chassis, the chassis current will flow to safety ground rather than through someone touching the chassis.

In most buildings, the safety ground wire is "daisy-chained," or connected from one outlet to the next. This arrangement can cause hum problems because each outlet's ground terminal is at a different resistance to earth ground. Consequently, hum currents may flow between two pieces of audio equipment plugged into separate outlets.

A better arrangement is to run a separate, insulated ground wire from *each* outlet back to the ground plate in the circuit-breaker box (or to the console ground bus). That way, all the outlet grounds are at the same potential. The audio equipment is then grounded through its three-prong power cords.

A solid copper #6 ground wire is recommended, and #16 should be the smallest used. Try to keep the lengths of all the ground leads about equal (for equal resistance to earth ground). These ground wires should never short to the conduit, or you'll get ground loops. Special wall outlets are available that float (isolate) the ground terminal from the wall box; the wall box is grounded through the conduit instead.

OCTOBER 1983

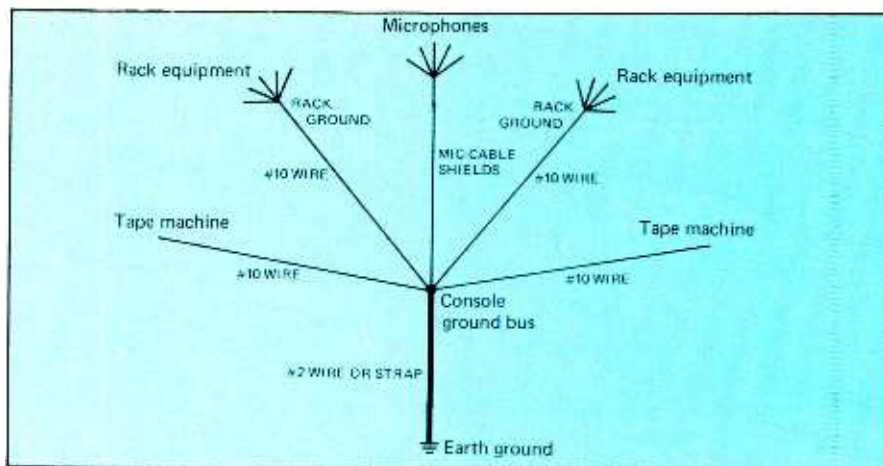


Figure 1. Proper studio grounding scheme.

Some studios prefer to connect the chassis of each piece of equipment separately to the console ground bus using #10 insulated wire or a one-inch copper braid. Then the power-cord grounds are floated by using 3-to-2 adapters. That is, one ground wire goes from the console ground bus to a tape deck; another wire goes from the ground bus to an equipment rack, and so on. The console ground bus is connected to earth ground. There is a single ground point for every major piece of equipment in the studio.

A proper grounding scheme resembles a tree (*Figure 1*). The earth ground is the roots; the heavy cable from earth ground to the console ground bus is the trunk, and the ground leads from the console ground bus to studio equipment are the branches. Some branches in a tree divide into smaller branches; this corresponds to rack-grounding schemes (described later).

A touring sound system should carry its own single-phase power distribution system, because building ground wiring is unreliable. The ground leads should be wired as just described. See *Figure 2* for a suggested AC power wiring system.

Rack Grounding

A rack is a grounded metal cabinet used to hold signal processors and patch panels. Audio equipment bolts onto rack channels, which are vertical metal strips with holes in them. Inside the rack is an AC outlet strip to power the rack equipment. Also inside the rack, near the bottom, is a rack ground securely bonded to the rack.

This rack ground is connected to the system ground bus by a heavily insulated wire (#10), and the rack power ground is floated. Alterna-

tively, the power ground from the AC outlet strip is used to ground the rack.

There are several different approaches to grounding the rack equipment:

1. Isolate all the rack equipment from the rack (and each other) by using nylon mounting screws and washers. Then run a separate insulated ground wire from each unit's chassis to the rack ground. Put three-to-two adapters on the power cords. As an alternative, ground the equipment through the AC outlet strip using the ground pin in each power cord.
2. Connect each unit to the rack channels with a heavy cable or strap. Connect the rack ground to the console ground bus with a heavy wire. Or, connect the rack ground to the AC outlet strip's housing, which should be grounded. Float the power cord's ground pins with 3-to-2 adapters.
3. Ground each unit to the rack; also use individual ground wires running to the rack ground.
4. Put all *unbalanced* audio equipment in the same rack to shorten signal paths. Isolate these units from the rack and each other by using plastic mounting hardware (or a wooden rack). Ground the chassis either to the console ground bus or through the power-cord grounds. Don't ground the chassis if the unit has a two-prong AC plug.

Small Studio Grounding

The "tree" grounding arrangement described earlier is used in large professional installations using balanced lines. For small studios using unbalanced equipment and two-wire power cords, only the console needs a solid connection to earth ground. The

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Dual rear-firing tuned-port speaker system features rigid die-cast zinc chassis drivers in "un-box" enclosure. 9" woofer and 5" cone mid-range feature flat-wound ribbon-wire voice coils, tweeter is 1" dome. Frequency range 35-22,000 Hz.; power range 25-140 W; sensitivity 92db at 1kHz; crossovers 450 and 3.5kHz; impedance 8 ohms; 22¾"H X 14¾"W X 11¼"D; 55 lbs.

Suede gray Nextel \$450. ea.
Simulated walnut grain \$410. ea.

DQM-7 COMPACT Speaker System

Dual rear-firing tuned-port speaker system features rigid die-cast zinc chassis drivers in "un-box" enclosure. 9" woofer features flat-wound ribbon-wire voice coil, tweeter is 1" dome. Frequency range 37-22,000 Hz.; power range 25-120 W; sensitivity 90db at 1kHz; crossover 3kHz; impedance 8 ohms; 21¾"H X 13¾"W X 11¼"D; 50 lbs.

Suede gray Nextel \$365. ea.
Simulated walnut grain \$325. ea.

DQM-5 Speaker System

Dual rear-firing tuned-port speaker system in "un-box" enclosure. 9" woofer features flat-wound ribbon-wire voice coil, tweeter is 1" dome. Frequency range 37-22,000 Hz.; power range 25-120 W; sensitivity 90db at 1kHz; crossover 3kHz; impedance 8 ohms; 21¾"H X 13¾"W X 11¼"D; 45 lbs.

Suede gray Nextel \$300. ea.
Simulated walnut grain \$260. ea.

DQM-3 Speaker System

Acoustic suspension speaker system in "un-box" enclosure. 8" woofer features flat-wound ribbon-wire voice coils, tweeter is 1" dome. Frequency range 50-20,000 Hz.; power range 25-120 W; sensitivity 90db at 1kHz; crossover 2kHz; impedance 8 ohms; 17¾"H X 11¾"W X 10¾"D; 35 lbs.

Suede gray Nextel \$225. ea.
Simulated walnut grain \$200. ea.



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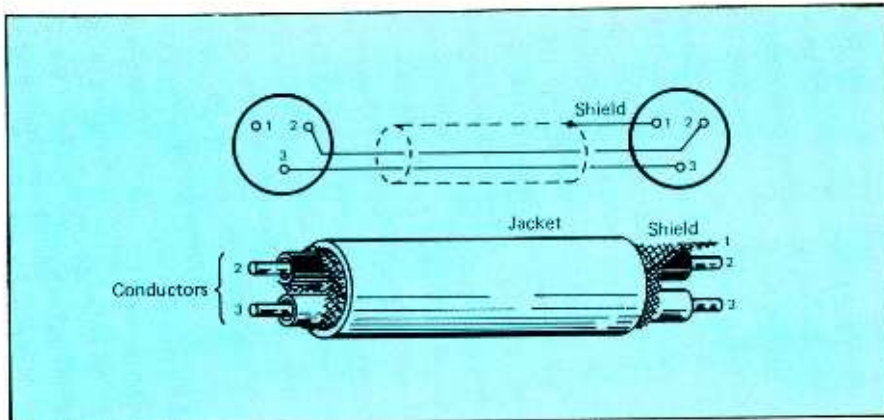


Figure 3. Connect cable shields only at one end to prevent ground loops.

shields should be tied to pin 1 on both ends—otherwise the microphone housing won't be grounded.

Audio cable should have an insulating jacket to prevent ground loops to the shield. The greater the shield coverage, the better it rejects hum. Therefore, use cable with foil shielding for permanent wiring. Twisted-pair cable rejects hum better than non-twisted pair.

In unbalanced systems (much home-studio equipment), the shield is usually left connected at both ends and the power ground is not used (except at the console). But in noisy locations it may help to use two-conductor shielded cable with a telescoping shield, as in *Figure 4*. That way the conductors will be isolated somewhat from the shield currents. Teac offers special cables for use with their unbalanced equipment.

When connecting balanced equipment to unbalanced equipment, use two-conductor shielded cable, and tie the low side of the balanced line to the unbalanced-connector ground along with the shield. Usually, pin 2 is low for line-level cables; pin 3 is low for microphone cables.

Bundle or group together microphone cables separately from line-level cables, and keep these separated from speaker cables. Crosstalk or oscillations may occur if high-level and low-level signals are run together.

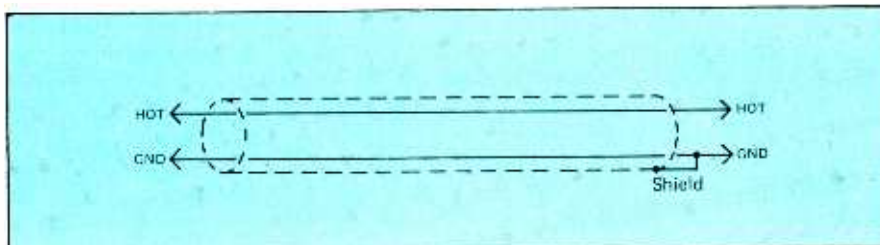


Figure 4. Two-conductor shielded cable is recommended in noisy environments.

Connections to Guitar Amps

Electric guitar players can receive a shock when they simultaneously touch their guitars and the sound-system microphones. That occurs when the guitar amps are plugged into outlets on stage, and the mixing console (to which the mics are grounded) is plugged into a separate outlet across the room. As stated before, these two power points may be at widely different ground potentials, so a current can flow between the grounded mic housing and the grounded guitar strings. This is especially dangerous when the guitar amps and the console are on different phases of the AC mains.

You should force the guitar amps' chassis and console chassis to be at the same ground potential by running a heavy insulated wire between them, and floating the power-cord ground pin on the stage amps. The console should be grounded to a power ground, earth ground or cold-water pipe.

For small club set-ups, power the guitar amps and audio gear from the same AC distribution outlets. That is, run a heavy extension cord from the stage outlets back to the console (or vice versa). Plug all the power-cord ground pins into grounded outlets. That way, you prevent shocks and hum at the same time.

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The DOD Dual 15-band graphic equalizer R-830A offers quality and performance at an incredible price.

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 Unbalanced + 24 dbm
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 Balanced + 20 dbm
 Unbalanced + 17 dbm
 *Maximum output level:
 (ref: 1mW/600 ohms)
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Some engineers prefer to use three-prong to two-prong cheaters to float the guitar amps to break up ground loops, and use direct-box cables for a safety ground. But cable shields can't carry the heavy current in event of a power short to chassis, so the musicians may get shocked anyway. It's better to ground the amps and use transformer-isolated direct boxes to prevent ground loops.

If you measure any voltage between a stage amp ground and power ground, run a heavy wire between them. Using a neon tester or voltmeter, measure the voltage between the electric guitar strings and the

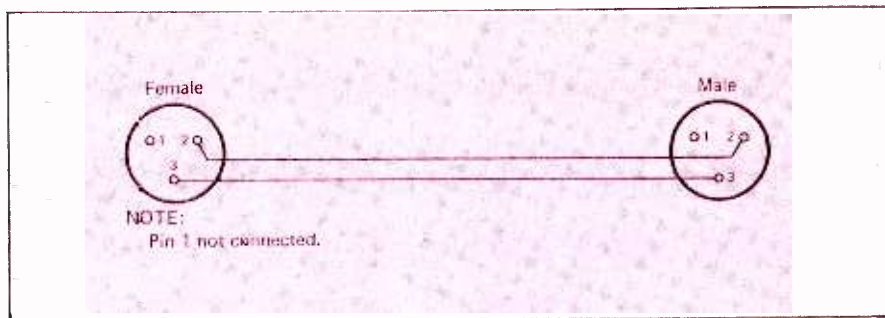


Figure 6. Signal-cable ground lift adapter used to lift one end of unforeseen double-grounded cables.

metal grille, and handle of the microphones. If you measure a

voltage, correct the situation before proceeding.

Interconnecting Multiple Sound Systems

When live concerts are recorded, three separate sound systems are commonly used: the house PA system, the stage monitor system, and the recording system. These three systems share the stage microphone signals by taking transformer-isolated, balanced feeds from a three-way microphone splitter (Figure 5). To avoid ground loops between the three systems, only the cable shields going to the recording truck are connected at the splitter. The cable shields going to the house PA and monitor mixer are disconnected at the splitter (say, by ground-lift switches).

The PA mixer and monitor mixer can be powered off outlets from the recording truck. That way the three systems share a common ground. Sometimes a ground stake can be driven outside the recording truck and connected to the recording truck's ground bus.

Often a radio station or video crew takes an audio feed off a studio's recording console. Prevent hum problems by using consoles with transformer-isolated inputs and outputs. To patch external equipment into a sound system, use a 1:1 audio isolation transformer between the outboard equipment and the system. Such a transformer is especially useful when interconnecting balanced and unbalanced equipment. It should have an electrostatic shield and should be able to handle +20 dBm. Mount it in a rack near the patch panel.

If you encounter an unknown system where balanced audio cables

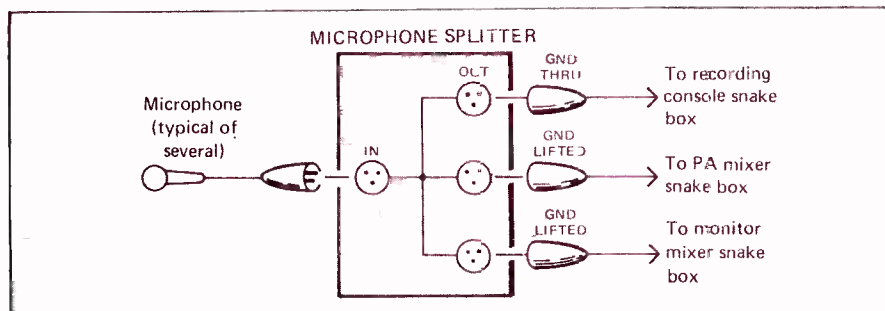



Figure 5. Microphone splitter used to share microphone signals among three systems commonly used for live recording.



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may be grounded at both ends, carry along some signal-cable ground-lift adapters (*Figure 6*) to float the extra ground connections.

Reducing Microphone Hum

Microphone and mic cables are especially sensitive to hum pickup because of the great amplification needed for mic-level signals. Here are some tips to minimize microphone hum pickup:

- Use low-impedance microphones (150-600 ohms), which pick up less hum than high-impedance microphones.
- Use microphones with balanced outputs (three-pin connectors), which pick up less hum than unbalanced microphones (hot conductor plus shield).
- If you have unbalanced microphone inputs on your recorder, use a balanced cable from mic to recorder, then unbalance it using a transformer plugged directly into the recorder.
- If hum pickup is severe with dynamic microphones, use dynamic microphones with humbucking coils built in.
- Use well-shielded mic cables. Routinely check the cables to make sure the shield is connected on both ends.
- Check that the mic connector is securely screwed into the mic handle (look for a set screw in the handle near the connector).
- Inside the mic-cable connector is a ground lug that connects to the connector shell. Tie it to pin 1 so that the shell is grounded. To avoid ground loops in outdoor setups, insulate the shell with tape. Also tape over cracks between connectors to keep out dirt and moisture. Be sure snake boxes (microphone junction boxes) are *not* grounded locally—they should be grounded only through the multi-conductor cable shield.

Reducing Electric Guitar Hum

- Replace or repair guitar cords with broken shields. Make or use only high-quality cords with metal-jacket plugs.
- Flip the polarity switch on the guitar amp to the lowest hum position.
- Flip the ground-lift switch on direct boxes to the lowest hum position.
- Have the guitar player turn up his or her guitar all the way, then turn down the gain on the guitar amp.

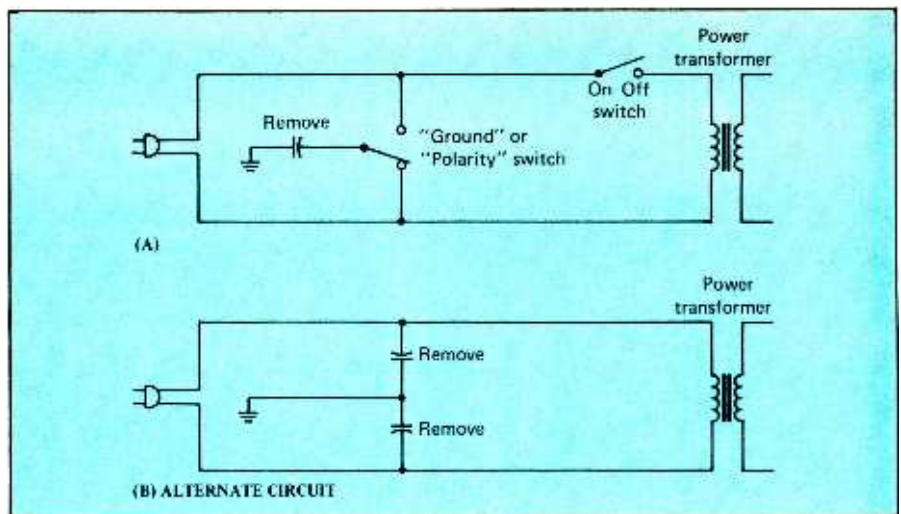


Figure 7. Removal of capacitors from across the power-line input of the guitar amp can reduce noise problems and shock hazard.

- Have the player move around or rotate to find a spot with minimum hum pickup.
- Use guitars with humbucking pickups, or install modern humbuckers in older guitars.
- If necessary, add extra shielding to the compartment housing the tone and volume controls. Add aluminum tape grounded to the guitar output jack. Also check foil connections under the pickups.
- If the power-supply filter capacitors in the guitar amp are corroded, replace them.
- Remove the 0.047 mfd capacitors across the power-line input in the guitar amp (*Figure 7*). They may create noise problems or cause a shock hazard.

Reducing Radio-Frequency-Interference (RFI)

This type of interference is heard as a buzz, transient clicks, radio programs, or “hash” in the audio signal. It’s caused by CBs, computers, lighting, radar, radio and TV transmitters, industrial machines, auto ignitions, and other sources. To reduce RFI:

- Use wide copper straps or braids for ground connections, rather than wires, to reduce the high ground resistance caused by “skin effect.”
- Install high-quality RFI filters in the AC power outlets. The cheap types from local radio shops are generally ineffective.

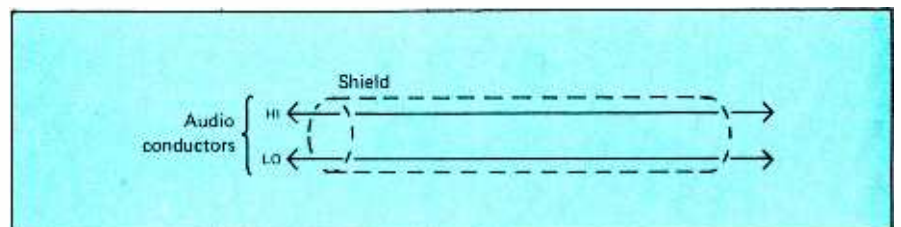


Figure 8. A balanced line, which consists of two signal-carrying conductors and a separate shield.

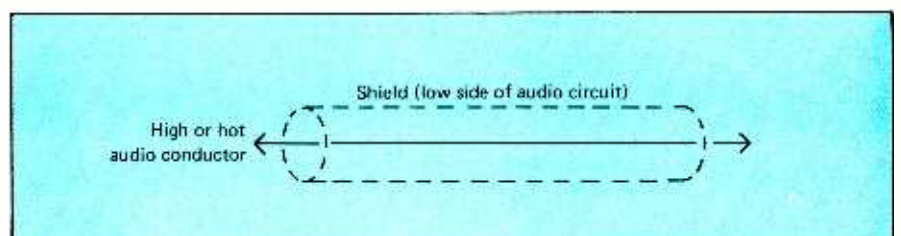


Figure 9. An unbalanced line, which consists of a single conductor and a shield, both of which carry signal.

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Until now, designing a premium professional amplifier was seemingly a set procedure. All that was needed to introduce a new product was a new feature, a hot new component, more power, or perhaps some complicated circuit gimmickry designed to impress others with "technical superiority."

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12. Dual Power Supplies

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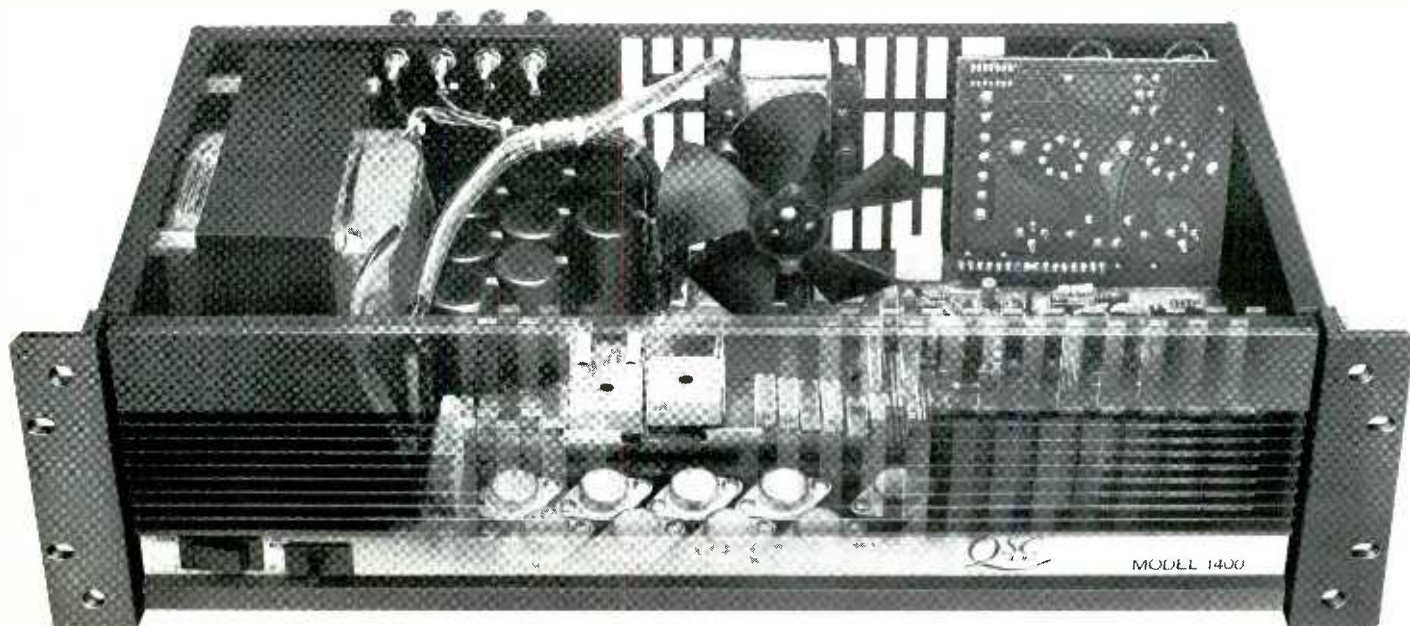
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- Physically separate lighting power wiring from audio cables.
- Avoid SCR dimmers—instead, use multi-watt incandescent bulbs to vary studio lighting levels.
- Use enclosed equipment racks.
- Avoid long ground leads and unbalanced lines over 10 feet long.
- For each unbalanced mic input, connect a 250 pF to 1000 pF capacitor between the hot terminal and ground.
- If the mic-connector shell isn't grounded to the chassis, connect a 0.001 mfd mylar capacitor between the shell terminal and the console chassis.
- Long speaker cables can act as an RF antenna. Shunt the RF to ground at the power amp speaker terminals. Connect a 0.01 mfd to 0.03 mfd disk capacitor between one speaker lead and the amplifier chassis ground. Use one capacitor per channel.
- If RFI is a serious problem, connect the unconnected end of the cable shield to pin 1 through a 0.01 mfd capacitor.

Summary

The most important points to remember about hum prevention are the following:

For balanced equipment in large installations—

1. Put audio equipment on a separate power feed.
2. Use AC isolation transformers or AC line filtering if necessary.
3. Ground the chassis of all major equipment to the console ground bus via separate low-resistance wires. Connect the console ground bus to a single earth ground.
4. Connect each chassis of rack equipment separately to rack ground, and connect the rack ground to the console ground bus.
5. Leave all shields unconnected at one end (except in mic cables and in one feed from a microphone splitter).

For unbalanced equipment—

1. Use only the cable shields for grounding. Ground the console ground lug to earth ground.
2. Put unbalanced equipment in a single rack, isolated from the rack and each other.

Check the catalogs of large electronic supply houses for AC isolation transformers, line-noise filters, audio isolation transformers, and isolated-ground AC outlets.

Glossary

AC Mains: The 60 Hz, 120-volt AC power wiring supplied by the power company. The wiring to circuit-breaker boxes and wall outlets.

Balanced line: A connection between two pieces of audio equipment that uses two conductors to carry the signal, surrounded by a shield (see *Figure 8*). The shield doesn't carry any signal, but it's connected to ground and keeps electrostatic hum fields out of the conductors. Balanced lines are used in large installations because they provide better hum rejection (common-mode rejection) than unbalanced lines.

Earth ground: A connection to moist dirt in the ground we walk on). This connection is usually made through a copper ground rod or a cold-water pipe.

Float: To disconnect from ground. A three-prong to two-prong adapter (cheater) on a unit's power cord floats its chassis from ground.

Ground: The zero-signal reference point for a system of electronic components.

Grounding: Connecting pieces of electronic equipment to ground. Proper grounding ensures that there is no voltage difference between equipment chassis.

Ground bus: A common connection (usually a heavy copper plate) to which equipment is grounded.

Ground loop: A loop or circuit formed out of ground leads. The circuit loop that is formed when two or more pieces of equipment are connected to ground through more than one path. Ground loops result in audible hum and should be avoided. They occur when two pieces of audio gear are connected to each other through a cable shield and also through the AC power ground.

Hum: A low tone or buzz heard along with the audio signal. Hum frequencies are 60 Hz (50 Hz in Europe) and multiples of that frequency. Hum is caused by faulty power supplies; oscillating electrostatic and magnetic fields from power wiring, transformers, and other equipment; and ground loops.

Power ground (safety ground): The connection between a chassis ground and earth ground through the U-shaped hole on an AC power outlet. The bare wire in AC power wiring connects to that socket, and grounds equipment chassis to earth ground through the round ground pin on three-wire plugs. This prevents shocks to the user if there is a short between the power cable and the chassis. Note: Some older power wiring omits the safety ground.

Shield: A conductive enclosure around signal-carrying conductors, used to keep out electrostatic hum and other interference. In audio cables, a shield usually takes the form of a foil or metal-braid cylinder around one or two conductors. Metal racks, equipment chassis, and microphone handles are also shields. Shields must be connected to ground at one point to function effectively. They do not block magnetic hum fields from transformers and motors unless made of a magnetic material.

In review, *shielding* means protecting circuitry with a grounded conductive enclosure, preventing hum and interference from passing through. *Grounding* involves connecting all the components' chassis to earth ground, making them the same potential and providing a drain path for shield charges.

Tie: To connect electrically.

Unbalanced line: A connection between two pieces of audio equipment that uses a single conductor surrounded by a shield (*Figure 9*). Both the conductor and the shield carry audio signals, so the shield isn't as effective in reducing hum as it is in a balanced line. Unbalanced lines work fine in consumer hi-fi equipment and in recording equipment using cables under 10 feet long.



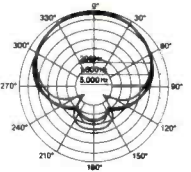
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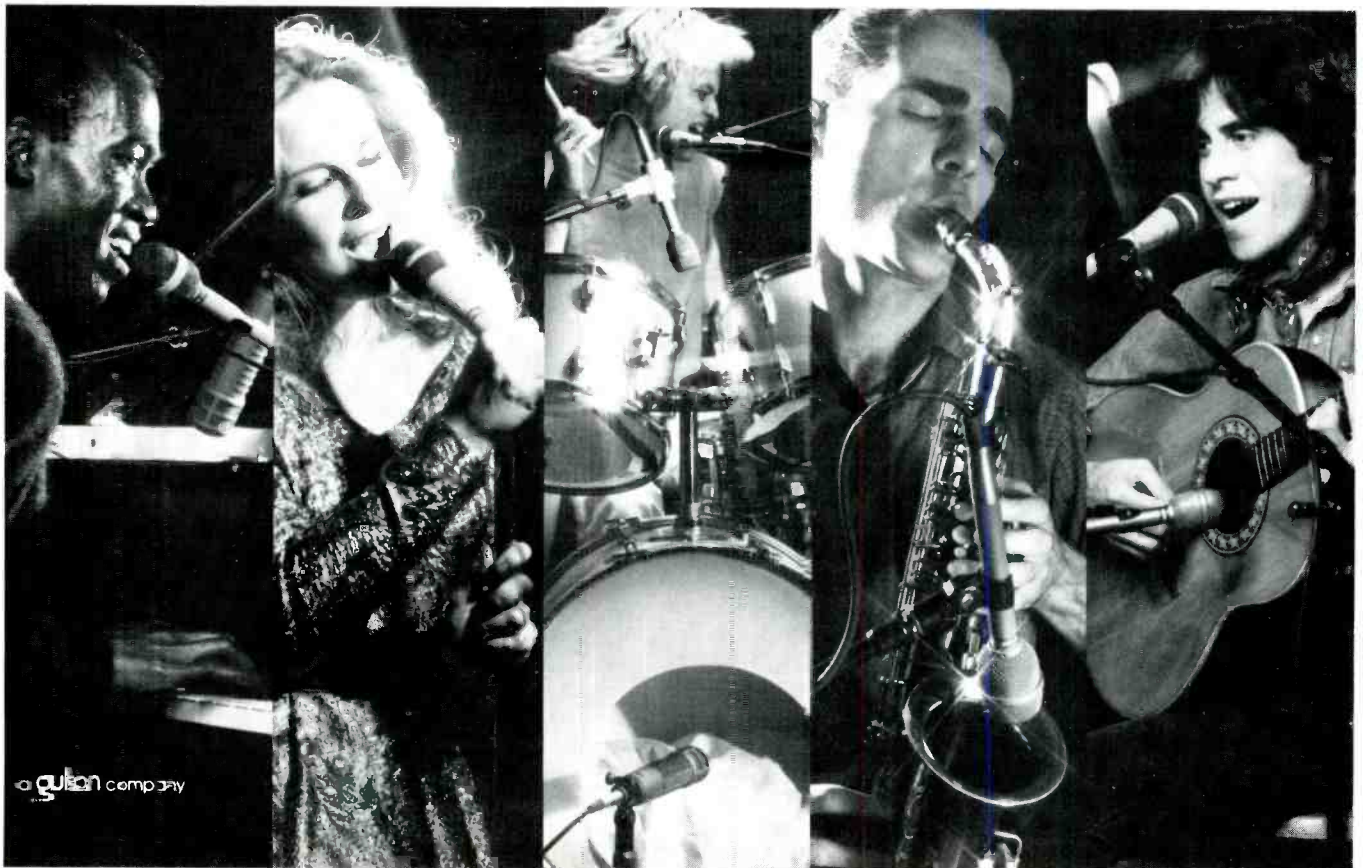
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Musicians Notebook

by craig anderton

The DeltaLab Echotron

Readers of this column are probably aware that I like using long delays to create effects such as solid-state tape looping, live “multitracking,” solid-state recording, and so on. DeltaLab certainly noticed my interest in long delays, because one day they called me about a device they were introducing called the “Echotron,” and mentioned that they needed someone who could write about long delay applications for their manual. As a result, I received one of the first Echotrons for evaluation. I enjoyed playing with it so much I eventually ended up doing a demonstration tape for DeltaLab in addition to the manual material.

The reason why I mention this is because some readers might question the propriety of reviewing units from companies to whom I consult. While I agree that this is a valid concern—I’ve spent a lot of time thinking about it myself—I’d like to mention a few important points. First, my primary loyalty is to the readers. I can always find other magazines to write for and other manufacturers to consult to—but the loyalty of a readership is irreplaceable. Second, the companies I deal with understand fully that my writing activities are separate from my consulting. They also understand that one of the reasons I consult is to learn more about products, so that I can write more intelligently about the field in general. Finally, companies almost universally realize that criticisms should be addressed, not ignored. As a result, they *expect* me to mention any points I don’t like in a review. Only in this manner can they make improvements in their products and find out what a working musician really thinks. Manufacturers have, many times, taken some of my criticisms seriously enough to remedy them in subsequent production runs.

Sorry if that got a little long-winded, but I wanted to make sure that any one reading these reviews knows exactly where I stand. Now, on with the story.

What is It? The Echotron (\$699 list) is the first delay line I know of that has been optimized specifically for long delay effects. It will not do flanging, chorusing, slapback echo, doubling, or similar short delay effects; it will, however, provide delays anywhere from 256 milliseconds (ms) to 4,096 ms. By purposely restricting the number of features, DeltaLab has been able to provide lots of delay at a pretty reasonable cost. Nonetheless, the Echotron is not totally a “bare bones” affair, as it also includes circuitry to synchronize to drum units, a metronome, and infinite repeat capabilities to store and repeat sounds in the unit’s memory. These features make it easier for players to use extremely long delays, for reasons we will discuss later.

The input section includes an input level control which, in conjunction with two LEDs, lets you match

the Echotron to a variety of signal sources. As with the Effectron, you cannot plug high impedance output devices (such as a standard guitar without on-board electronics) directly into the rear panel input jack. While you won’t damage anything, the sound will be noisy and will also pick up some “garbage” being generated by digital circuitry within the unit itself. Going through a device that converts the guitar to a low impedance output (compressor, preamp, or similar electronic device) solves this problem. Unlike the original Effectrons, which would not accept strong signals without input padding, the Echotron handled signals from my +4 studio with no problems.

The output section includes a delay mix control to vary the proportion of straight and delayed sounds, and an output jack and level control that reside on the rear panel. This output control lets you match the Echotron to low level inputs (such as guitar amps) or high level inputs.

You set the amount of delay with two controls: a range pushbutton and a factor control. With the pushbutton in, the factor controls sweeps the delay from 256 to 1024 ms (a 4:1 ratio). With the pushbutton out, the factor controls sweeps the delay from 1024 to 4096 ms. As with the Effectron, the sound quality becomes “grainier” with longer delays, but the bandwidth remains constant over the full sweep range. Highs are down by 6 dB (voltage ratio, or 3 dB power ratio) at 16 kHz, which for four seconds of delay is really quite good.

The feedback control is a little unusual. At center position, there is no feedback. Turning the control clockwise increases the feedback—thus increasing the number of repeats—while retaining virtually full bandwidth. Turning the control counter-clockwise also increases the feedback, but this time, the bandwidth is restricted by a 3 kHz low pass filter. This option is extremely useful when you want succeeding echoes to sound less bright, in order to simulate the sound of echoes in an acoustic space. Also note that there is a rear panel stereo jack which allows you to insert outboard signal processors into the feedback loop. For example, if you want succeeding echoes to sound brighter rather than duller, you could patch a high pass filter into this jack. Or, for echoes that change pitch, you could plug a pitch transposer into this jack... well, you get the idea.

So far, these controls are pretty standard. What is not so standard is that the Echotron also allows for synchronization to drum units (see my review of the PCM-42, which offers a related feature, in the January 1983 issue of *Modern Recording & Music*). Before we can understand how this works, though, we need to look a bit at one of the main problems inherent in using long delays.



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Those of you who have played with echo units have probably noticed that with delays exceeding about 100 ms, the repetition created by multiple echoes implies a particular rhythm. Some players even set echo times to synchronize with the beat of a song. With very long delays, however, the echoes occur too far apart to imply a rhythm. Thus, long delays have traditionally been used for dreamier, legato type music such as "Frippertronics" (popularized by guitarist Robert Fripp). However, the Echotron, as we'll see later on in the review, has several convenience features that make it highly suited for use with long delay times.

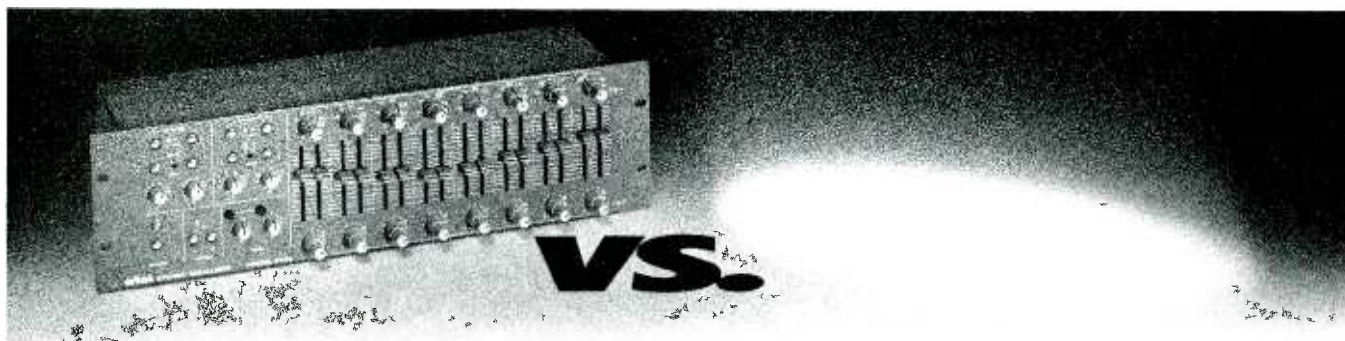
Pre-Flight for the Echotron. To fully evaluate the Echotron, you will need an extra channel to pick up the Echotron's metronome signal, a drum unit which follows the 48 pulses/quarter note external clock standard (E-mu Drumulator, LinnDrum, Korg KPR-77, etc.), and another extra channel to monitor the drum output. (Incidentally, the Echotron's sync output also supports 24 pulses/quarter note and 96 pulses/quarter note drum units; however, this requires rewiring a jumper inside the unit. To rewire, take off the top cover, then locate the three circuit board jumpers labelled I, J, and K in the vicinity of the output jack. Break the solder link between the two J pads with a sharp knife. Add a solder link between the two I pads for a 24 pulses per quarter note sync pulse, or between the two K pads for a 96 pulses per quarter note sync pulse. Please note that the factory does not support this modification, and fooling around with

your unit's insides will void the warranty.) The metronome and sync signals are available at the ring and tip connections respectively of a stereo jack. You will probably have to wire up a stereo-to-dual-mono-plug cord; plug the metronome output into your mixing console, and the sync output into the drum unit's external clock input. While you're at it, plug a footswitch into the rear panel repeat jack to make checking out the repeat function more convenient, and also check that the rear panel output control is turned up at least partway.

Now that everything's plugged in, we can check out the sync and metronome features.

Evaluating the Metronome. The metronome section, which uses a pushbutton to select between 4/4 and 3/4 time signatures and is generally used with the delay switch in the out (long delay) position, produces a timing pulse that is referenced to the delay time. The length of a measure is assumed to equal the delay time. Therefore, if you have a delay time of two seconds, there will be a click every half-second if you've selected 4/4, or a click every 2/3 of a second if you've selected 3/4. For visual cueing, an LED flashes at the beginning of each bar, while a second LED flashes on each beat in a measure. As you play along in time with the metronome, your playing will automatically be synchronized to the delay time. This means that all echoes will occur on the beat, lending your playing a cohesive, synchronic effect.

The Echotron also includes infinite repeat (or hold), which stores (captures) signals in the delay line



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memory. While in infinite repeat mode, this sound sample will repeat over and over until infinite repeat is turned off. With most infinite repeat switches, you have to hit the switch *exactly* on the beat where you want the storage process to start. But the Echotron's infinite repeat switch is synchronized to the metronome, which greatly simplifies matters. When you push the infinite repeat switch in, nothing occurs until the beginning of the bar. At this point, the delay starts sampling (as indicated by an LED), and at the end of the bar, stops sampling—thus going into the infinite repeat mode, as also indicated by an LED. This not only makes it easier to capture sounds, but also insures that whatever you store will be in sync with the music. Note, by the way, that while we keep referring the delay time to a measure of music, at very long delays you could just as easily treat the delay time as two measures of music, and consider the metronome as clicking every half-note instead of every quarter-note.

Evaluating the Sync Output. Unfortunately, there is no "run/stop" command coming out of the Echotron, which means that while your drums will be synchronized to the Echotron's delay period, you must start the drums exactly on the beat if you want them to be in sync with the music. In practice, this isn't too difficult, but does require some attention. Once you've got the drums started on the right beat, they will remain perfectly synchronized to the echo time.

The drum sync feature opens up some very powerful applications. In one instance I drove the E-mu Drumulator from the sync output, and turned up the feedback control for lots of echoes. Due to the synchronization, all echoes fell perfectly on the beat, thickening up the sound and in some cases adding precise double-time effects. After a while, I stored one measure of the drums-plus-echo sound using infinite repeat, stopped the Drumulator, and played electronic drums "live" over the stored pattern. Very interesting.

I discovered another application while working on the Echotron demo tape. For one section, I stored two measures of motorcycle sounds using infinite repeat. These sounds were then synched to the drums so that the motorcycle accelerated during the first measure, decelerated and squealed to a stop during the second measure, accelerated during the next measure, decelerated, and so on.

Evaluating the Delay Line. As a delay line, the sound quality is virtually identical to the Effectron, so refer to that review for details. The short form review is that at shorter time settings of the factor control, the sound quality is excellent; as you turn the factor control past about three-quarters, the sound acquires a graininess—especially with complex instruments such as polyphonic synthesizers—that becomes more obvious with large amounts of feedback. There is also a modulation noise-like sound that creeps into the output at longer delay settings. However, a very positive point is that unlike many other long delays, the Echotron retains full high frequency bandwidth even at the longest delays.

Overall Evaluation. The Echotron was designed to fulfill a certain need, which it does extremely well; but there are some frustrating limitations. First,

you cannot sync the Echotron to an existing sync track—it must always serve as the "master." This rules out taking advantage of the Echotron's sync capabilities in an overdub situation. I had this same complaint about the Imagineering Audio EDR and Lexicon PCM-42, so please, will somebody out there make a long delay line whose sync features work as well in the studio as they do live? There is hope, though. I talked to one of the engineers at DeltaLab about this problem and he noted that since the clock which sets the delay time could easily be voltage-controlled, it should be possible to set up a phase-locked loop that would compare the Echotron's metronome output to an existing metronome click track, and feed a correction voltage to the Echotron's clock to retain sync. I haven't had the time to try this yet, but I will... and if it works, I'll write it up as a modification.

One of the side benefits of making the clock voltage-controlled is that the Echotron could then serve as a poor man's "Emulator." You would store a sound in the Echotron memory, and vary it over a 4:1 range via the control voltage input. While this input would surely not be compatible with the synthesizer keyboard standard of IV/octave, it wouldn't be too hard to rig up a little keyboard with some switches and pots and play simple melody lines.

Also note that once a sound is stored, it cannot be triggered on demand or edited. I'd love to have an operating mode where the stored sound would not repeat, but just sit in memory until hit by a trigger pulse. The Electro-Harmonix "Instant Replay" allows for this, and it seems like it wouldn't be too hard to add this option to the Echotron. A trigger input could also provide a reset-like function (assuming that the Echotron metronome tempo was set very close to the click track tempo) that would let the Echotron sync to an existing click track. As far as editing is concerned, one feature of the EDR I liked a whole lot was the factor control, which would let you shorten the recorded sound by any amount. The Echotron includes no such option.

Still, the Echotron was never intended to be a digital recorder or sampling device, so perhaps the above comments are unfair. And, admittedly, many musicians might not have any use at all for these options—options which would significantly increase the price tag. But someday I hope a company will produce my idea of the ultimate long delay. It would probably be a commercial disaster, but I sure would use it!

Even without the sync features, the Echotron makes a fine echo unit with excellent sound quality and lots of delay for the money. The sync features, though, make this device much more open-ended. I've spent many hours synching drum machines, arpeggiators, and other triggered devices to the Echotron; in fact, I am currently designing a live act that will most likely use the Echotron as the master tempo generator rather than the clocks in my drum units. I've also used the Echotron to build up choir effects, play extremely rich solo passages, and provide stereo percussion effects that are unreal. It's significant that my complaints involve functions which aren't there but that I would like to see; those functions which are present work exactly as intended. For those of you who are creative enough to want an echo unit that can also be used creatively, look into DeltaLab's Echotron.

Criteria's Mack Emerman

by ken pohlmann

It is a beautiful, sunny afternoon in Miami, and our intrepid MR&M reporter has resisted the temptations of sand and surf to travel up to North Miami to visit Mack Emerman, the owner of Criteria Recording Studios—one of the most prestigious world-class studio complexes in the country.



Modern Recording & Music: For those readers who might not be acquainted with Criteria, could you give us a chronology of the Studios?

Mack Emerman: The studios are an overgrown hobby! Criteria, as a company, was started in 1955, and was first operated in my home for a couple of years here in Miami. By 1957 I had decided that the recording business was what I wanted to do; I bought the piece of land, the land that we're sitting on now, and built a little 30 by 60 foot building which opened up in 1958. In 1967 we added our first addition, which was a large studio—we had high hopes that the movie industry was coming to the area. A project called Studio Center was being built down the street; it consisted of two large sound stages and a back lot—there were even plans for a hotel. I had dreams of doing large orchestra-to-picture work and thus built a 50 by 70 studio with a 22-foot high ceiling. By 1971 our business had changed quite a bit

and we were doing more work with bands such as Crosby, Stills and Nash, and Eric Clapton, and felt the need to have a studio that was more oriented to rock 'n' roll—high sound pressure levels, private entrances, that sort of thing. Studio C was the outcome of that expansion. Along about 1977 we were well on our way with the Eagles, the Bee Gees, and we saw the need to have a special room for vocal overdubs and thus Studio D was born.

Simultaneously, we were working on a plan to build a Criteria West in Los Angeles in a fifty year old building on the corner of Willoughby and Seward where Woody Woodpecker cartoons were once done. Now, up to that time, the studios were pretty much designed by myself. Not having the guts to take on the Criteria West thing myself, we made a deal with John Storyk to design three studios with perfectly identical control rooms and cutting room. Then, as everyone knows, the record busi-

ness went to pot and interest rates went sky high. We lost our nerve and abandoned the project—thank goodness. But we had a great design still on the shelf and I wanted to go ahead with a new room. A million dollars later the East Wing with Studio E was born.

MR&M: Could you bring us up to date on what the facility is presently comprised of?

ME: At the moment, the facility occupies 25,000 square feet, with five recording studios. Plus, we have a computerized, $\frac{3}{4}$ inch editing suite, a disc mastering room, and new mastering room in the East Wing. The new mastering room is an exact duplicate of the mixing room, a Storyk design, and will have a Cybersonics programmable console feeding a pair of Scully lathes with matched Ortofon cutters. We also have a 26 foot mobile vehicle with 48 microphone inputs with 48 track analog or digital recording capability—we call it Criteria's Wheels. We



Criteria's studio C in the 1970's. This was the home of the Eagles, BeeGees and many others. The console is a custom built MCI.

also have a complete film system with four dual dubbers (16 or 35mm) and a three-channel recorder (16 or 35mm) and Q-lock for sweetening production. Oh, I should mention our three live chambers—we're very proud of our live chambers.

MR&M: That's quite a facility, and quite a history—did the whole thing really come about because of your hobby of recording? Is that what happens to young kids who go wrong and get into engineering?

ME: No. Basically I'm a trumpet player. I started playing trumpet in

high school, had a little dance band, and graduated to Duke University where I played with the Duke Ambassadors Band as "screech" trumpet player, as it was known in those days. I had aspirations of becoming a professional musician. The Ambassadors Band actually was a hot band and used to have "battles of bands" with Tommy Dorsey and Charlie Barnet and the other big bands. At some point we all left to fight the war, and when we got back, the big band thing was almost over and I found myself more and more

interested in the recording of bands. I got myself a model K Presto inside-out disc recorder and that's where it all really started. When I moved to Florida, I started recording on a freelance basis. I had a couple of Telefunken microphones and a Berlant Concert Tone tape machine. I was recording a local blind pianist, Herbie Brock, and a jazz record company executive was there and started to sign Herbie and I got the gig. When word got around, all the local musicians started calling me to record. I started recording in my house, or working out of the back of my station wagon—booking various large rooms around town. I graduated to Ampex 350, and accumulated an EMT chamber and a Scully lathe. The building of the studio was the next logical step.

MR&M: Did you see Miami as the next recording capital?

ME: Aside from the possibility of more film business, there really wasn't any reason to suppose that would happen. There was some agency work, some black and Latin work, and local talent. The point is I had found something I was good at, and I enjoyed doing it, so I attacked it with zeal. It wasn't too long until we

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had a lot of gold records hanging on the wall.

MR&M: Have times changed, or could a newcomer still make it into the business along those same lines?

ME: In all honesty, I doubt it. I was very fortunate to be in the position where I was the only game in town. I was completely self-taught, especially in the technical end of things. I knew what I wanted to hear, and was able to make every mistake there is to make, and learn from them. I don't think a young person could afford to make those kinds of mistakes anymore. It was a pretty extravagant education. If I had had a University of Miami Music Engineering program or a SPARS program, where I could have asked questions, it would have been a lot better than just hanging around and trying to absorb things sponge-like.

MR&M: Our readers might not know that SPARS stands for Society of Professional Audio Recording Studios, and that you're the president. Could you explain what SPARS is, and why it came about?

ME: I had always had the idea of an organization looking out for studios' interests—a lot of my best friends are studio owners. About ten years ago Phil Ramone and Terry Levine and I had a few meetings and kicked around the idea of an organization representing studios' interests, but nothing came of it. Later, a big discussion arose concerning the inability of a studio to communicate with manufacturers. That developed into an invitation from MCI (now MCI/Sony—Ed.) to talk over the problem. Shortly thereafter SPARS was born with 13 major studios. Since then, our scope has developed into a far-ranging organization whose credo is "innovation through education and communication." Now it's in the position to help young people in the way I wanted to be helped back in the old days.

MR&M: What kinds of projects is SPARS currently involved in?

ME: We have a hot-line to answer questions that arise—instant answers for anyone who's perplexed about any aspect of the business. We have a digital certification program underway to help alleviate some of the confusion over digital recordings. That's just two of many.

MR&M: The hot-line sounds great. Is it available to everyone?

ME: Absolutely. Our publication, *Datatrack*, contains information

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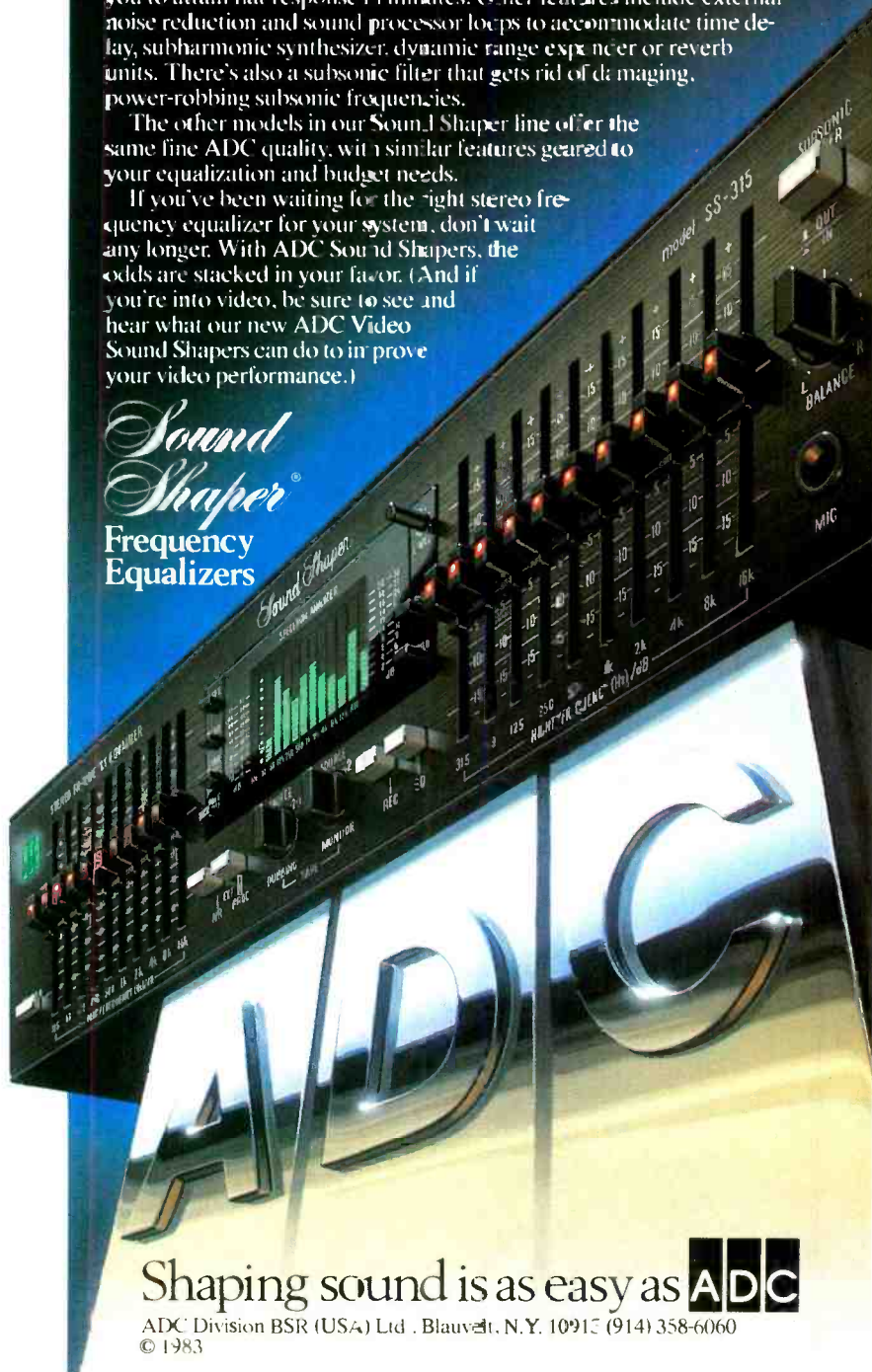
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about the line, and we will be running ads in all the trade magazines publicizing details. (See page 72—Ed.) Anyone in the industry, and that includes the young people working out of their garages, who has a question about the industry—how do you handle tape storage, or, I can't get my machine to work—can be directed through the SPARS office and the person most qualified to respond will be put on line to give the guy a personal answer. If that's not worth being a part of, I don't know what is.

MR&M: Could you fill us in on the consumer certification code that SPARS has advocated? Do you anticipate trouble with the marketing of digital recordings?

ME: We're afraid that the poor consumer will get hot and bothered about the Compact Disc, but he won't know how digital it is. He might very well get some old music recorded with old technology that has been falsely represented as a digital recording. When the quality isn't what the consumer expected it should be, he should understand why. That's why we're pushing for fair representation on new discs. We are very concerned with the industry's public relation problems. We think the industry has to tell people more about what's really going on.

MR&M: One final point as far as education goes—you've been a strong supporter of the University of Miami's Music Engineering program....

ME: I sure have! It's the greatest—one of the lucky things that's happened to me—to be in the town where the finest education program for our industry is located. Almost all of the new employees at Criteria are coming out of the University's program. It's a natural for us. The intern interface between us works well for both the student and us, and after they've completed seven semesters at the School, and one with us, those graduates are of high quality. The idea of bringing people off the street and training them up through the ranks—I'm not sure that today's advanced technology permits that anymore. Some people might disagree with me, but I think that studios need someone with real credentials. Of course, it all ultimately depends on the individual and the particular talent that's there.

MR&M: It sounds like Criteria is plugged into an upward trend in terms of more sophisticated equipment, techniques, and employees.

ME: Criteria's destiny is to become a recording teleproduction center. The facility we have is large enough to accommodate a multitude of services. I go along with (Record Plant president) Chris Stone's idea of "diversify or die." My biggest problem along the way was to not encourage diversification whenever the chance arose. It's easy to get swept up with gold records and rock 'n' roll and lose sight of change. Without losing any of that expertise, we want to move on to something else. The big project now is Criteria Film and Video—an operation designed for video clips. We have a ¾ inch computerized editing room, and Studio A is a space with a 90 foot cyclorama with a lighting grid, and the room doubles as a sound stage.... That's our direction.

MR&M: Criteria is obviously a solid studio from the audio standpoint, but can you really start all over again, from a visual standpoint?

ME: I understand what you're saying. It became very apparent to me when we had an extreme fall-off of business at the beginning of 1980 that five audio-only studios was too much and that we had to consolidate some of our dreams and begin doing something constructive. Exactly whether or not some of these things are achievable—only time will tell. But we've made our decision and our ventures in visual mediums have brought us closer and closer to our expansion goals.

MR&M: Martin Polon has said that the audio industry is like a sleeping giant. Do you think that video could wake it up?

ME: There's a combination of events about to happen. One of the things I've been waiting for, for such a long time, is stereo television. The networks aren't remotely prepared for what's going to happen when the public gets an ear and eye full of stereophonic television sound. And that's true not just from a music standpoint, but from all audio standpoints. A person can get much more involved with a program which otherwise wouldn't get the time of day from him. Stereo television, along with digital recording and the Compact Disc, will have a very broad acceptance and help the audio recording business tremendously.

MR&M: You've been a strong advocate of digital recordings from the very beginning. Are you still true to the cause?

ME: I'm convinced—more con-

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vinced than ever. We've had our share of experience with the different formats and manufacturers, and most of it has been absolutely flawless. You hear stories of tragedies, and we had some troubles with an experimental system, but that was only a prototype, and we anticipated some trauma. But the other systems we have worked with have performed perfectly. And from my personal standpoint as a still-active engineer, I feel that the digital machines truly represent the console better than anything that I've ever heard. It's an achievement of a dream that I've always had, so I'm extremely

excited about them. Also, the machines could represent a real cost saving to a studio like Criteria because we spend a lot of time aligning our analog machines and preparing for different tape formulations. The digital machines seem to work perfectly, or not at all. Most of the time you turn them on and go, with never a burp or a hitch. I couldn't be more enthusiastic.

MR&M: I know that you've just recorded John Denver on 32 track digital, mixed to 2 track digital. Will he be back next year for more of the same?

ME: Well, he says he will. He gave

us nothing but compliments for both the sound and the way he was treated here. He said that if anyone has any doubts about our facility, they should call John—and I intend to take him up on that offer right here in this article! I was excited and flattered to know that he felt so good about everything, and he had a wonderful experience with that 32 track digital machine, a Mitsubishi; it was flawless. I've used the Mitsubishi system on a lot of my own projects and I've done things with it in the way of editing it that would make their designers shudder—no white gloves, just cut and splice, taping pieces of tape to the walls to keep them off the floor. I've just never had a problem.

MR&M: How many clients are specifying digital these days?

ME: Well, it's a slow-moving thing. I think the two technologies will go side by side for a long time to come. There are too many talented people out there who have used the aberrations of analog to their advantage. They've been clever enough to build that sound into their own sound styles, and made some of the defects work to their advantage. And recording is just like playing—it's tough to abandon a successful technique or sound. Only over a period of time will they move on to digital. Unfortunately, pop and hard rock music probably benefits from analog sound, and the signal-to-noise ratio that's available on digital is often wasted for them. The point is, the music should rightfully dictate the technology, not the other way around.

MR&M: Digital recordings certainly set entirely new recording standards. Will studios have to clean up their acts in terms of room noise, etc?

ME: Boy, will they! And will *we!* You can even hear a shield on a cable. Everybody will have to reconsider some of the things you used to be able to get away with. A thrown-up room simply will not work with digital. Here in our facility, one of our projects is to look at our whole air conditioning system, and perhaps scrap it in favor of something quieter.

MR&M: You mentioned the Compact Disc a number of times. Do you consider it as the next consumer playback standard?

ME: I certainly do. The Sony and Philips people have a tremendous headstart on the Soundstream card, and the Disc seems to have been extremely well received in both Japan and Europe. Apparently, one

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of the reasons we don't have more of them yet in America is that they can't make the discs fast enough to satisfy those marketplaces. It should have a significant impact on our business and I have high hopes that it will overcome the bootlegging situation. Hopefully, the manufacturing technology is difficult enough so as to discourage bootleggers, and it won't make any sense to copy onto tape a disc that can be purchased at a fair price, is indestructible, and can be played at home, in the car, or anywhere. However, the old vinyl disc won't go out quickly because of the tons of playback equipment and software libraries. They'll have to co-exist for awhile.

MR&M: The difference between success and failure in the recording business probably depends on your luck in anticipating trends in the business. What are you anticipating now?

ME: The video thing, of course. Criteria Film and Video is my latest gamble. Well, I hope it won't be too much of a gamble. I think we've finally put the people together to do promotional videos as well as audio recording. We've just completed a video for Chuck Mangione. The interiors were done in Studio A, syncing action to pre-recorded tracks. We also did a clip for RCA-Mexico—for Emmanuel. The clients have been happy with the work so far, and we look forward to many more video sessions.

MR&M: In case our readers can't read between the lines, I should note that you sound pretty optimistic.

ME: You always have the fear that the phones will stop ringing, but that's the studio business. Fortunately, with the help of lower studio prices and special deals for young bands, we are expanding our client base. I guess we're doing what it takes to keep five studios filled.

MR&M: Is there anything that's not so good?

ME: Yeah. I wish I wasn't spending so much time running the business.

MR&M: What?

ME: I wish I had more time in the studio. Engineering sessions are still the thing I like best.

MR&M: One final request. I'm sure the readers will be curious about this photograph showing your car. What model is it, and how fast does it go?

ME: That's my Maserati Merak. And it goes a lot faster than the Highway Patrol lets me drive it.

OCTOBER 1983

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A microphone breakthrough that combines the ruggedness and high spl tolerance of a well-designed dynamic mic with the precise, wide-range response and open, uncolored sound of a condenser. Among the select few studio-quality mics that can stand up to the rigors of the road.

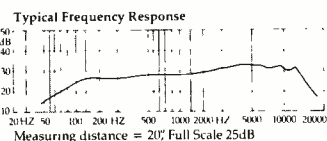
M-1 Miniature System

A whole new approach to microphony. The fingertip-sized condenser element combines ruler-flat response with ultra-high spl capability to handle the most difficult tasks. A wide range of optional accessories extend the M-1's versatility.



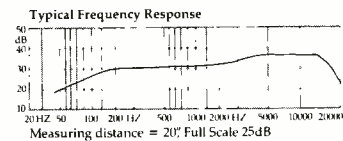
D-1 Dynamic Microphone

The exciting new D-1 directly challenges the most popular vocal mics on the road today—and emerges the clear winner in price/performance comparisons. Features a well-behaved cardioid pickup pattern, smooth off-axis response, and superior shock mounting—plus the presence lift and bass proximity effect that enhance vocal reproduction. \$70 (suggested retail).



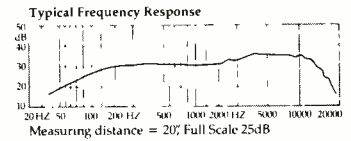
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The satisfying heft of the D-2's satin gunmetal case and the smooth, seductive sound it lends to vocals place it a step above other dynamic mics. Its low harmonic distortion and high spl capability tell part of the story—but specs alone can't convey the D-2's natural, well-balanced, exceptionally musical sound quality. \$137 (suggested retail).



D-3 Slim-Line Dynamic

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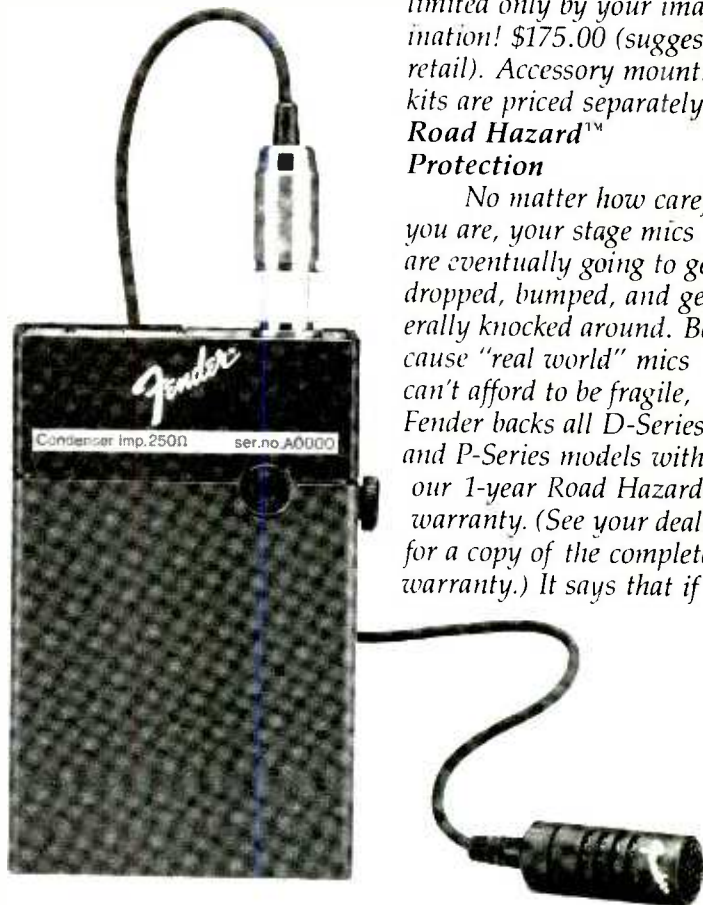
M-1 Miniature Condenser Microphone System

A brilliant bit of Fender applications engineering that opens the door to a whole range of innovative microphone techniques. The high-performance cardioid

you the freedom to get as close as you like to any sound source. Special, optional application kits let you mount the M-1 to a drum stand, an acoustic guitar, a headset or eyeglass frame. The possibilities are limited only by your imagination! \$175.00 (suggested retail). Accessory mounting kits are priced separately.

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No matter how careful you are, your stage mics are eventually going to get dropped, bumped, and generally knocked around. Because "real world" mics can't afford to be fragile, Fender backs all D-Series and P-Series models with our 1-year Road Hazard warranty. (See your dealer for a copy of the complete warranty.) It says that if



P-1 Condenser Microphone

This superbly accurate, multi-purpose mic uses Fender's breakthrough technology in permanently charged condensers. It can reproduce blistering sound levels of over 150 dB without overload. Four switch-selectable response options allow tailoring of frequency response for virtually any application. External phantom or battery powered. \$220 (suggested retail).

P-2 Condenser Microphone

With the same advanced element technology as the P-1, this economical mic offers much of the same great performance. Consistent on- and off-axis sound and amazing ruggedness make it an unbeatable all-around stage mic with studio-quality sound. Like the P-2, the P-1 is covered by Fender's 1-year Road Hazard™ warranty. \$99 (suggested retail).

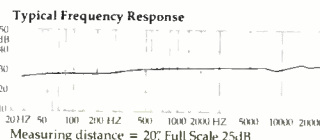
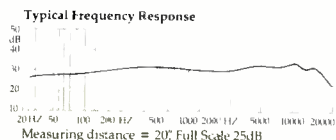
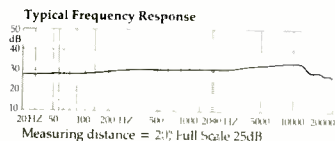
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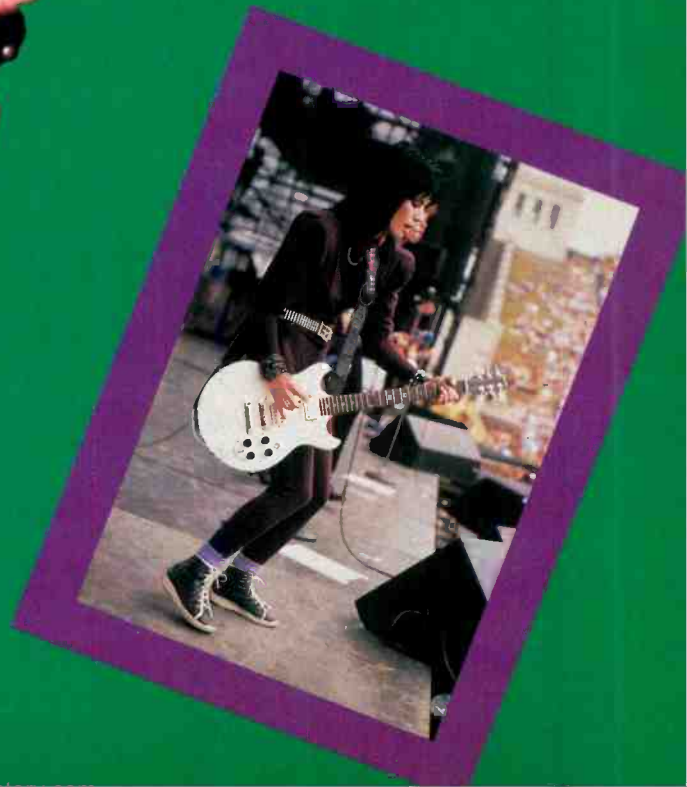
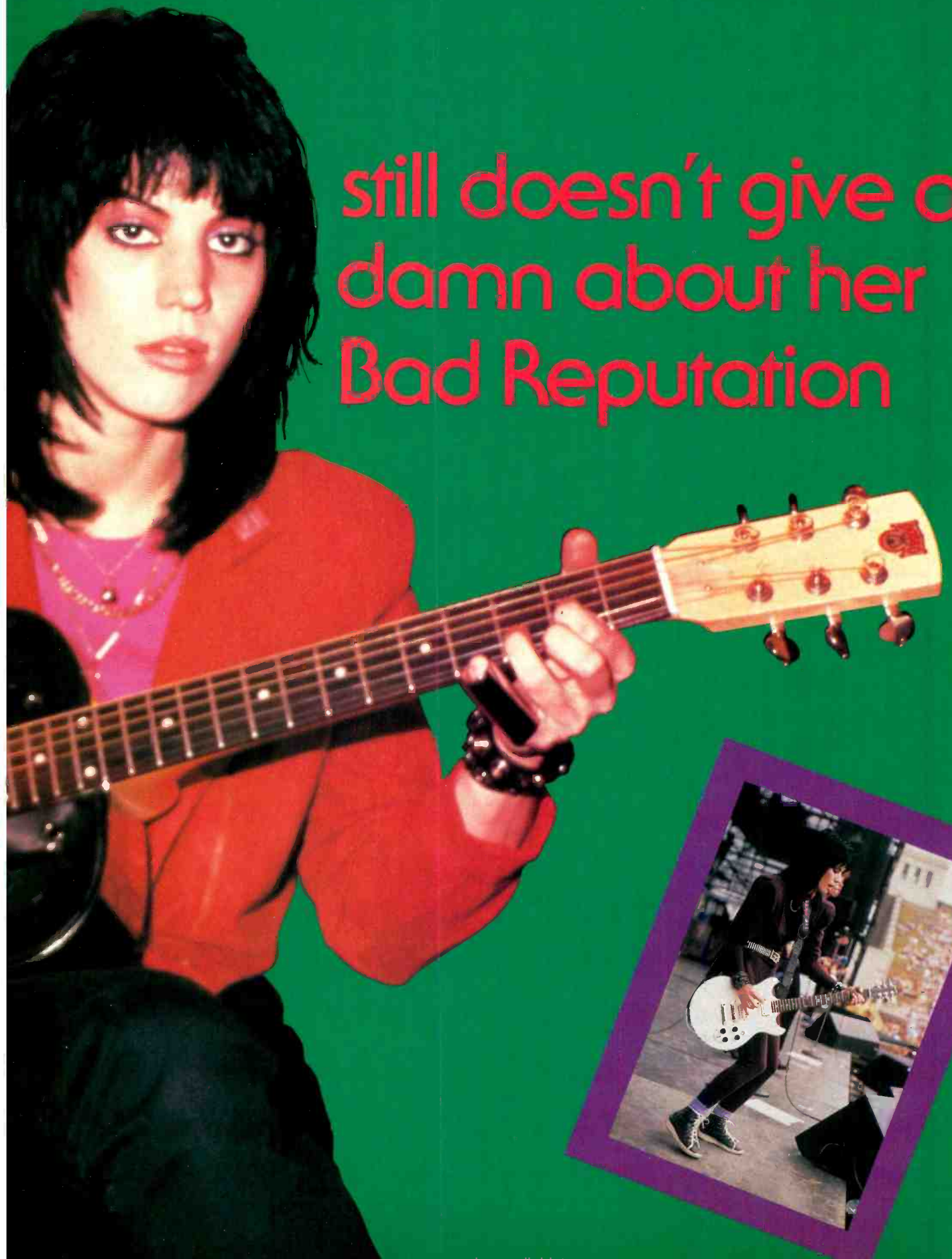


ellen zoe golden

JOAN JETT



still doesn't give a damn about her Bad Reputation



When I say, 'I don't give a damn about my reputation,' I really don't!

Ain't no doubt about it, Joan Jett is tough.... And cool. Yeah, tough and cool just about sums up this 24-year-old leather-clad lady, particularly since Jett has led the type of rock 'n' roll life where one would have to be as strong as the leather she so favors in order to retain some sanity. Consider the facts:

At 15, Jett was part of Kim Fowley's brainchild, the *Runaways*, where the only real interest anyone had was in how much T&A the girls would show when they ground it out onstage. Never mind that someone like Jett had talent. The tumultuous aftermath of harassment and self-abuse has not been forgotten; JJ now performs songs like "Bad Reputation," from her debut, and "Fake Friends," the first single from the newest record, simply titled *Album*.

One would think the days of swine and poses would

be a memory for Joan Jett, but in the shadow of a #1 single, "I Love Rock 'N' Roll" (from the album of the same name), the raven-haired beauty still finds herself the object of music business blacklisting. Her manager and co-producer, Kenny Laguna—actually the most intelligent kid I know—says the female axe-slinger didn't make many rock critics' fave lists last year because "she's a chick who sweats like a man." Need anything more be said regarding songs like "Coney Island Whitefish"—originally titled "Scumbag"—and "I Had Enough" from *Album*?

Ultimately, though, nothing matters but the fans. *Modern Recording & Music* has followed Joan Jett's solo career for years, watching her legions increase as she toured the world incessantly. We caught up with her and Kenny Laguna during a break in the touring—generally the time she records a new album—to discuss her current regimen, *Album*, and her increasingly important role at Kingdom Sound in Syosset, New York.

Modern Recording & Music: Although you're not officially credited as co-producer of *Album*, understand you have been taking on a more active role in the recording process.

Joan Jett: I put in more hours than I normally would listening to what we've done. In a regular situation, I'm doing song selection and arrangement, which the whole band is also involved in doing.

Kenny Laguna: She always did that. She always has final word on the songs.

JJ: I do a lot of listening to balance. I don't know that much about getting the sounds, but I know about what I like to hear. I listen to a lot of mixes to see if there is too much bass or too much drums, etc. I try to find what sounds the most like us.

MR&M: It sounds like you are really getting involved.

JJ: In an official and technical capacity, no. I'm not turning knobs, but I do know a little about the technical terms. I leave the real technical stuff to Kenny and Ritchie [Cordell]. Both Kenny and Ritchie were producers during Buddah Records bubblegum hey-day.]

KL: Joan is the last word. Ritchie and Glenn [Kolotkin, associate producer] get the drum sounds. Glenn is a straight engineer. He understands

relationships between different instruments. Ritchie is real good at the overall picture. Joan gets the final selection of songs. I come up with the brilliant ideas. Most of the album is done in here [Nino's Rehearsal studios in Baldwin].

JJ: Kenny has a real talent for being about to hear the band and he knows what sounds good. When he listens to the songs or sits in the control room, he knows where little parts come in. When we add a part, he never forgets that we did, and he makes sure that it comes through.

MR&M: The Joan Jett and the Blackhearts sound is basically guitar-bass-drums. But, you do use other instruments for ambience, although they aren't outwardly noticeable in your recordings.

KL: You can hear that. I'm a piano player and Joan hates piano.

JJ: I like piano on records, I just don't like it on our records. I do, but I don't.

KL: We've got it together now so that a piano has certain overtones. It's done so that the piano doesn't affect the guitar. Also, there's a sax on "Do You Wanna Touch Me (Oh Yeah)" that nobody knows about.

JJ: There's something about the piano—and the sax does the same—and I don't know exactly what it is.

There are certain deep rich tones of a piano and sax that blend well with bass and guitar, and fatten them. You don't really notice it. You don't really hear it. It's not something conscious, where you would say, 'I hear the piano. I hear the sax.' It's not mixed that way.

MR&M: Joan, do you find that you strain to pay attention to the final product now that you are taking on a more active role?

JJ: No, because my whole thing has to do with feel.

KL: Joanie was always involved in all aspects. There's no difference, except that she's involved with song elimination.

JJ: Sometimes you have to decide between a flawless basic track that sounds sterile and a track that has a couple of mistakes but sounds really good and has energy.

MR&M: Can you be a little more specific about the recording process?

JJ: We set up very live. Ricky [Byrd] sometimes does his guitar breaks on the basic tracks, which I think is very unusual. I know that a lot of bands lay a basic rhythm track and then some sort of solo is added, like a guitar solo. But Ricky does it right there first, which gives the record more of a live sound. More



energy. It's the same thing we sometimes do with the vocals.

MR&M: What's the appeal of Kingdom Sound?

JJ: We recorded here last time. It's on Long Island, where I live.

KL: It's really cheap (he laughs), and we recorded the hit here [*I Love Rock 'n Roll* was also recorded at Kingdom Sound].

MR&M: This is actually only your second album with the band as it stands now—Ricky, Gary Ryan (bass) and Lee Crystal (drums). Are you more comfortable this time around?

JJ: I think everyone is more comfortable. Ricky is writing songs. I find that the songs I've written have had harder parts. They're more difficult to play. People can see the progression of this band after being on the road for three years straight. Even though we do a song that's basically three chords, they now sound... I don't know how to put it....

KL: Harder, pure....

JJ: Yeah, wild and raunchy.

MR&M: I keep trying to get you two to talk about the technical aspects of recording a Joan Jett and the Blackhearts album, and you keep talking about how things feel, or how songs are played.

KL: People complicate things in rock 'n' roll and they lose the essence. They make it sound corporate. The higher the technology, the more expensive and the more bullshit is attached to records. You can do what this band does with a four-track.

JJ: We don't fight technology, we just don't use it.

MR&M: Well, Kenny, you must admit you have a knack for making hit, radio-oriented songs. Not only with Joan, but with Buddah acts like 1910 Fruitgum Company, Tommy James and the Shondells, etc.

KL: It comes from the songs and the arrangements.

MR&M: For Joan, what do you listen for? Do you have a so-called "ear for radio"?

KL: Everything is in the song. The sound of the record is formed in here, in the rehearsal studio. It's only translated in the recording studio, and, if anything, we just do it. When you prepare a song carefully, the sound comes out of the arrangement. It's psychological. If you get the guitar to sound a certain way when it's by itself, the sound changes when the bass comes in, but it's still that same guitar. It creates a sound. I don't care what they put on it—they've tried everything—it still

sounds like Joan. People who are really into guitar know she's got a sound.

MR&M: We're talking about the guitar sound for records. Is it different live?

JJ: It's not really different live. It's one sound and I always get it. Since I was in the Runaways I've used a Gibson Les Paul guitar, and no matter what pick-up I use, I still get the same

sound. I started to use certain pick-ups—Red Velvet hammers I got in LA—and always got the same sound. Now I use Music Man amps, and no matter what studio I'm in, gig I'm at, no matter where I play, the sound that comes out of my amp and into the mic, in the studio or live, is exactly the same sound all the time. Even when I change guitars—I can change models—it's the same sound.

Joan Jett and the Blackhearts' Album, as told by Kenny Laguna

"I Love Playin' With Fire": This is a Runaways song. The words are: 'I love playin' with fire/I don't wanna get burned/I love playin' with fire/I don't think I'll ever learn.' This is what Joanie's life is about. She wrote it when she was 15. People didn't take it seriously then, but now they will because they'll rediscover her.

"Fake Friends": 'When you were down/They were never there/And when you're all alone/You really get to learn/That if you get back up/They're gonna come around/All the sicko fans/That like to make romance/To the ugly sound/Of them telling you/What you wanna hear/And you pretend/Cause they all agree/You're supposed to have/A better life/But you're getting worse/And they build you up/Till you fool yourself/That you're something else/And it's like a curse/Cause you can't live up/To what they make of you/And then they tell you that you're losin' friends/Losin' friends/Losin' friends/Cause you've got nothing to lose/You don't lose when you lose/Fake Friends.' That's a career song. It's about life in general. When you're up, you've got a lot of friends. When you're shit, you're shit.

"A Hundred Feet Away": 'Just a little girl in love/Staring at a penthouse suite/Waiting for the star above/To come and join her on the street/Cause maybe he'll want some company/And she's got a dirty plan/But he can disappear so suddenly/You'd better grab him while you can.' Then it switches to the guy: 'Standing in a lonely room/High above the crowd below/With no one there to share the gloom/When underneath begins to show/He's living in a world of fantasy/But he can't let the image fall/And he ain't the man he planned to be/And he would give it all/For just a little girl in love/Someone who can share his day/And just what he was dreaming of/Was just a hundred feet away.' Joan is the one that's the star and she knows she doesn't have a lot of companionship on the road on those lonely nights. She knows that of all those fans out there, there are a lot of people she could be happy being friends with, but she's never going to meet them.

"Handy Man": "Handy Man" is a sex song.

"Secret Love": She's with this guy and this other guy is with this other girl and they can't let on that they are having an affair. It's a beautiful song. The significance is that this one has horns on it. We've never had horns before. It was a big move for us to use them, but we tried our best to keep them pure.



KL: She's got character.

JJ: I really worked on my guitar because people tend to overlook rhythm guitar a lot. They tend to say rhythm guitar doesn't matter, but it's just as important as bass and drums. It keeps the tempo. It's the unstated thing. I don't say that because I am playing it, it's just that I notice it.

MR&M: You and Ricky interact well.

JJ: Yes, we really play off of each other. It's real good.

MR&M: Do the two of you ever record at once?

JJ: No.

MR&M: Do you keep a different perspective when you are recording a record as opposed to when you are playing live?

JJ: I always think live.

KL: The other thing is that we never really think about a song when we record it because 99 out of a 100 times we've played it live in the rehearsal studio or on the road.

JJ: I think we sound the same in the studio as when we are playing live. It can be different depending on the mics and the building and stuff, but it's more of a feel. Like I said, we set up live in the studio. We look at each other, we play off each other. Other bands have someone down the hallway, someone outside, someplace else where they don't even see each other. We react; we're right next to each other giving eye contact. We jump around just like we are on stage. We try to keep the tension of 'Oh, let's make this exactly perfect' out of it. And Kenny is always out trying to help us relax. He puts on headphones and stands out there with us. That's another thing. As producer, Kenny works with the band when we lay basic tracks. He'll sing a song to help us along so we can get a basic track. Nobody gets lost.

MR&M: Do you need much coaching when you sing?

JJ: Not really. 95 percent of the time everything I do is okay, except if I'm singing a wrong note. Then you work on it. Sometimes you sing and you find if you try to go softer, it might sound better. Sometimes I tend to sing too hard if I get excited. You have to try different ways. Like Kenny said, we rehearse live before we record so I already know that I have to sing soft or hard at a certain place. It doesn't need to be discussed in the studio unless we haven't done the song live.

MR&M: Are you a perfectionist?

KL: Ritchie is. Joan sings the songs the way she knows. Flat things don't get by. She doesn't sound like Johnny Rotten.

I'm telling you as a producer this band is magic. It's the band. Gary next to Lee next to Ricky and Joan. You can take them anywhere. It's consistent. It's not really the producers, it's Joanie. She developed the group situation that gives the records the Blackhearts sound.

MR&M: What's the difference between recording with Kenny and Kim Fowley?

KL: Top 40, big difference.

JJ: A lot of times, Kim would let the Runaways do a song while he sat in the control room. When we did

Girls are right at that point now where they have had enough of being told what to do. Every time we do a show in the States, the girls are on top of someone's shoulders. They're screaming; they're up front.

basic tracks, he didn't stay with us very much. He wasn't there all the time. At the final mixes—yes—but when we were recording the overdubs and stuff, we did what we wanted.

MR&M: That was actually the beginning of your recording experience. Shortly after the Runaways split up, you produced a Los Angeles hardcore band called the Germs.

JJ: Yeah, I didn't know what to do, so I just said, 'Okay, I'll do it.' I'd just done four studios and one live album with the Runaways. I went in with the Germs and did what I knew the Runaways had done. I watched them do basic tracks then decided which I felt were the best. I always consulted with them on it. Then we'd do vocals. We didn't do any effects or anything heavy, I just tried to make them sound like them. It was straightforward.

MR&M: Are you interested in producing another band?

JJ: It's hard to think about that because I'm so wrapped up in the Blackhearts. We've got a 16 month tour coming up.

MR&M: Let's talk about touring for a moment.

JJ: It's easy as hell to get a fix on who your audience is in America. We cover a lot of ground and cover a lot of different audiences.

MR&M: Considering you came from what is considered a "new music" background and your sound is actually "heavy" rock and roll, are you reaching women as well as men?

JJ: I read the fan mail as much as I can and so many girls are writing in saying 'I love the show. You've inspired me to pick up a guitar' or 'You've inspired me to start a band' or 'We're in a band and now we're doing good.' I'm getting people to do something. The major letters are the ones written by women who don't have anything to do with music. They say, 'You've inspired me by being

courageous and that inspired me in my career.' They write that they saw the way I handled myself and they try to apply it to their life and work.

MR&M: Isn't that what you wanted to do with your music? You were initially inspired by Suzi Quatro, right?

JJ: Yeah, but I didn't know I would get such a chance. Girls are right at that point now where they have had enough of being told what to do. Every time we do a show in the States, the girls are on top of someone's shoulders. They're screaming; they're up front. They're standing in line to get the best seats so they can scream and yell. The audience is a good 50-50 mix. It's not like the Runaways' audiences were. Unfortunately, they had a 99 percent male audience. The girls don't feel threatened by me at all. That's good.

MR&M: As a woman and a rocker, does that hit home with you?

JJ: Yeah, 'cause a lot of the girls want to let out aggressiveness. Everybody has to let out some sort of tension. It's best to be able to do it in a fun way. I get to do it on stage; everybody else gets to do it in the audience. They're as much a part of the show as I am.

We don't fight technology, we just don't use it.

MR&M: Now that you are in the public eye, do you feel a little bit stifled by your fans?

JJ: I'm not bothered, but I'm completely recognized. I can't go anywhere without hearing someone saying my name within five minutes. The only thing that bothers me about this is that it's a hassle to go out. I have to have preparation, like 'What if this happens and we have to get out of a place quickly.' I have to go with people. If I go out to a club, I have to go in an entourage. I can't just trot off by myself because everybody wonders 'Where's Joan? She can be anywhere in New York City—in any alley, anywhere!'

I don't get bothered by people coming up to me and talking about music or wanting autographs. A lot of other people can't find the time to talk to the people who put them where they are.

MR&M: Have you gotten used to being in a position where everybody talks about you and asks for your autograph?

JJ: I get very embarrassed, I blush. I feel as embarrassed as the person who says, 'I know people ask you this all the time, but can I have your autograph?' That's the way I am. I feel funny when they say, 'You're a rock star.'

MR&M: So you weren't one of those people who sat in their room and practiced signing autographs?

JJ: I did when I was 14. But then I was also thinking I wanted to be an actress. When I was 11 and 12, I was in the drama class at school and summer stock theater. And then, something happened on the radio, and all of a sudden it was rock 'n' roll.

MR&M: Was that the correct career choice?

JJ: People wonder if I would want to do a movie now. Yeah, I would, but if there's one thing that's so hard to get across to people it's that I like what I'm doing. Everyone thinks that because we had a *big* album [*I Love Rock 'N Roll*], three *big* singles ["I Love Rock 'N Roll," "Crimson and Clover," "Do You Wanna Touch Me (Oh Yeah)"] and we've been visible on tour, that we have a lot of money.

Well, we've got a lot of debts to pay back first—because we had to pay out a lot of money to go on all those tours. People think I live at a much higher standard than I do. I didn't get into this business for monetary reasons. That's a fringe benefit. If you happen to have the good fortune to make money, that's great. It's not anything to be ashamed of.

MR&M: You make doing an album seem like a simple task.

JJ: In the Runaways, there were times when I was pressured. Kim would say, 'I need a song in two hours. Go write it.' Then he'd throw lyrics at me. We literally wrote the song in two hours. It can be done, but that's the way I used to do it. Now I sit down and do it a different way. Sometimes I do it completely by myself, but when you've been on the road, you seem to come up with bits and pieces of songs... a chorus here, a melody there. At the end of the tour you've got seven choruses and 14 verses, and you've got to piece it together. I'll sit down with Kenny, Ricky, Gary and Lee and piece everything together like a puzzle.

MR&M: Your recent records have featured a progressively heavier guitar sound, and *Album* is a crunchy, hard rock opus that can satisfy just about everyone with tension to release.

JJ: It's a standard meeting of rock 'n' roll. When I play guitar, it's a very standard, Chuck Berry style.

MR&M: Does Ricky get to do more solos as the band moves along?

JJ: Yeah, but it hasn't gotten to the point where we go off on a lot of jams, like 15-minute jam sessions on stage. We stick to three- or four-minute songs.

MR&M: How do you feel about people like me saying that you are getting "heavier" and appealing to more record buyers with that sound?

JJ: Those are all media terms. Everybody gets them so mixed up. You've got what the Northeast thinks heavy metal is, and what the South thinks heavy metal is. You have what the Midwest thinks heavy metal is, then you have what the West Coast thinks heavy metal is. Then you have

what England thinks heavy metal is, which is completely different from what America think heavy metal is. Then you have Europe.... We're different. Everywhere we play, nobody knows what we are. They ask, 'What kind of band are you?' I tell them we are a dance band, a rock 'n' roll dance band. A loud rock and roll dance band. It's simple. None of us are Julliard graduates or anything like that, but everyone is extremely confident of what we do. It is hard to be good when you're doing simple music. Because it's simple, you've got to be very tight, otherwise you'll be too sloppy. But, you should be a little sloppy, because even that can make what you're doing good.

MR&M: Were you anxious about recording *Album*, especially since you had such success with *I Love Rock 'N Roll*?

JJ: No. But they do try to put it on you. I am a nervous person by nature so it's easy for me to get worried. I do need the reassurance, but also, I don't give a ?X! When I say, 'I don't give a damn about my reputation,' I really don't! If everything stopped tomorrow, I'd still want to play.

MR&M: You seem to be writing about the same things on *Album* that you've covered in the past.

JJ: I'm writing about pretty much the same things: sex, rock 'n' roll and a lot of partying. When I write, it feels like rock 'n' roll in a bar. That's what it feels like. It's simple. I don't ever want to write from the perspective of 'I'm a rock star.' I want to write so that my songs apply to everybody. When I sing, 'I da da da da,' that 'I' means each person. So if I sang 'I have lots of money' or 'I have a hundred cars' that means the people who are going to sing along to my songs aren't going to be able to relate to that. I don't ever want to sing from the point of view that I have this and you don't.

MR&M: So you haven't changed that much since your first album?

KL: She hasn't even changed her underwear.

MR&M: I heard you once say jokingly that Kenny was your influence for covering the Halos' "Nag," from your last album. What was your influence for writing "Coney Island Whitefish," which contains lines like 'You're a scumbag...?'

JJ: It's about a real person. Everybody knows a bleepin' scumbag. Maybe I can't get radio play, but then again, the kids choose what they want to hear.

MR&M: Where do you get this aggression that you express in songs like "Coney Island Whitefish" and "Fake Friends"?

JJ: "Fake Friends" is self-explanatory. The songs come from real life situations. It's not always directly related to me. It's something I can see in people around me—even if it's people I don't know.

KL: The release is to write the song. The hostility is still all around us. We're pissed off because they keep telling us that The J. Geils Band fits in and John Cougar fits in, but Joan doesn't. At the Grammy's, they missed her two million-selling record somehow. The Grammy's didn't matter to her, but I looked and saw that the Go-Go's were up for one. Certain bands just don't get that kind of recognition and they've lived through everything—like the Stones and the Who. Everywhere you turn, the slights. Joan didn't fit the mold.

MR&M: Do you know why?

KL: I don't think people are comfortable with Joan, maybe because she's a chick and maybe 'cause she's rubbing a lot of noses just by the nature of her career.

MR&M: I assume we're talking about the fact that Joanie couldn't get a record deal for her debut album, and now that she's made it big, those same people are hostile.

KL: She doesn't intend to make people angry, because she's very sweet. Joanie doesn't hold grudges. I hold enough for both of us.

JJ: Watching the Grammy's, you sit there and you look at all the songs nominated and you know that you sold so many records and they sold so many records and you know you're not on that list.

I'm not even nominated, I mean, give me a break! The industry refuses to believe that I could have been in a band that was unsuccessful (the Runaways) then hit rock bottom at age 20, be close to dead—having been through just about everything there is to go through—and then somehow come back. For some reason, I'm threatening somebody, but I don't know who it is. It's not the kids. They're out there saying, "Come on!" There are young people and old people who do come to see us who are legitimate fans. They don't mind the swearing, don't mind the reputation, don't mind hearing all the rumors that go around. Joan Jett and the Blackhearts have got the best fans in the world.

Joan Jett Discography

ALBUMS

THE RUNAWAYS

(Mercury, 1977)

THE RUNAWAYS

Queen of Noise (Phonogram, 1977, Import)

THE RUNAWAYS

Waitin' For The Nite (Mercury, 1978)

THE RUNAWAYS

And Now The Runaways (Cherry Red, 1978, Import Only)

THE RUNAWAYS

Flaming Schoolgirls (Cherry Red, 1980, Import Only)

JOAN JETT

Bad Reputation (Boardwalk, 1981)

JOAN JETT AND THE BLACKHEARTS

I Love Rock 'N Roll (Boardwalk, 1981)

JOAN JETT AND THE BLACKHEARTS

Album (Blackheart/MCA, 1983)

SINGLES

JOAN JETT AND THE BLACKHEARTS

12"—*Little Drummer Boy* (Boardwalk, 1981)

B/W *Victim of Circumstance* (Boardwalk, 1981)

JOAN JETT

You Don't Own Me (Boardwalk, 1981)

Don't Abuse Me (Boardwalk, 1981)

JOAN JETT AND THE BLACKHEARTS

I Love Rock 'N Roll (Boardwalk, 1982)

You Don't Know What You've Got (Boardwalk, 1982)

JOAN JETT AND THE BLACKHEARTS

Crimson and Clover (Boardwalk, 1982)

Oh Woe Is Me (Boardwalk, 1982)

JOAN JETT AND THE BLACKHEARTS

Do You Wanna Touch Me (Oh Yeah) (Boardwalk, 1982)

Victim of Circumstance (Boardwalk, 1982)

JOAN JETT AND THE BLACKHEARTS

Fake Friends (Blackheart/MCA, 1983)

Nitetime (Blackheart/MCA, 1983)

THE RUNAWAYS

Black Leather (Cherry Red, 1978-79)

THE RUNAWAYS

Cherry Bomb (Phonogram, 1976-77, Japan Only)

THE RUNAWAYS

I Love Playin' With Fire (Phonogram, 1977, Australia Only)

THE RUNAWAYS

School Days (Phonogram, 1978, U.K.)

B/W *Wasted* (Phonogram, 1978, U.K.)

JOAN JETT AND THE BLACK-HEARTS: *Album*. [Produced by Joan Jett, R. Cordell and Kenny Laguna; associate producer, G. Kolotkin; engineered by R. Cote; mastered by Vlado Meller.]

Performance: **Amazonian**
Recording: **Heavy duty**

Joan Jett is clearly the most successful survivor of the Runaways, one of the first of the '70s girl groups to give its members a shot at playing their own instruments. Not quite feminists, the Runaways at least had a tougher, more independent lyrical stance than their helpless, bouffanted predecessors of the '50s and '60s.

Jett has matured the stance originated in her teens, and the '80s find this young woman to be a successful producer and performing artist who still embodies the philosophies of an independent, outspoken individual.

Album, Jett's latest release, finds Joan and her Blackhearts applying the tried-and-true double Humbucking pickup team of guitars leading a simple, beat-reinforcing rhythm section on eleven songs about the pitfalls of love and life. The distorting guitars are smoothly blended in the mix; they often double chordal lines or branch off with lead/rhythm counterpoint that is like the two halves of a schizophrenic brain.

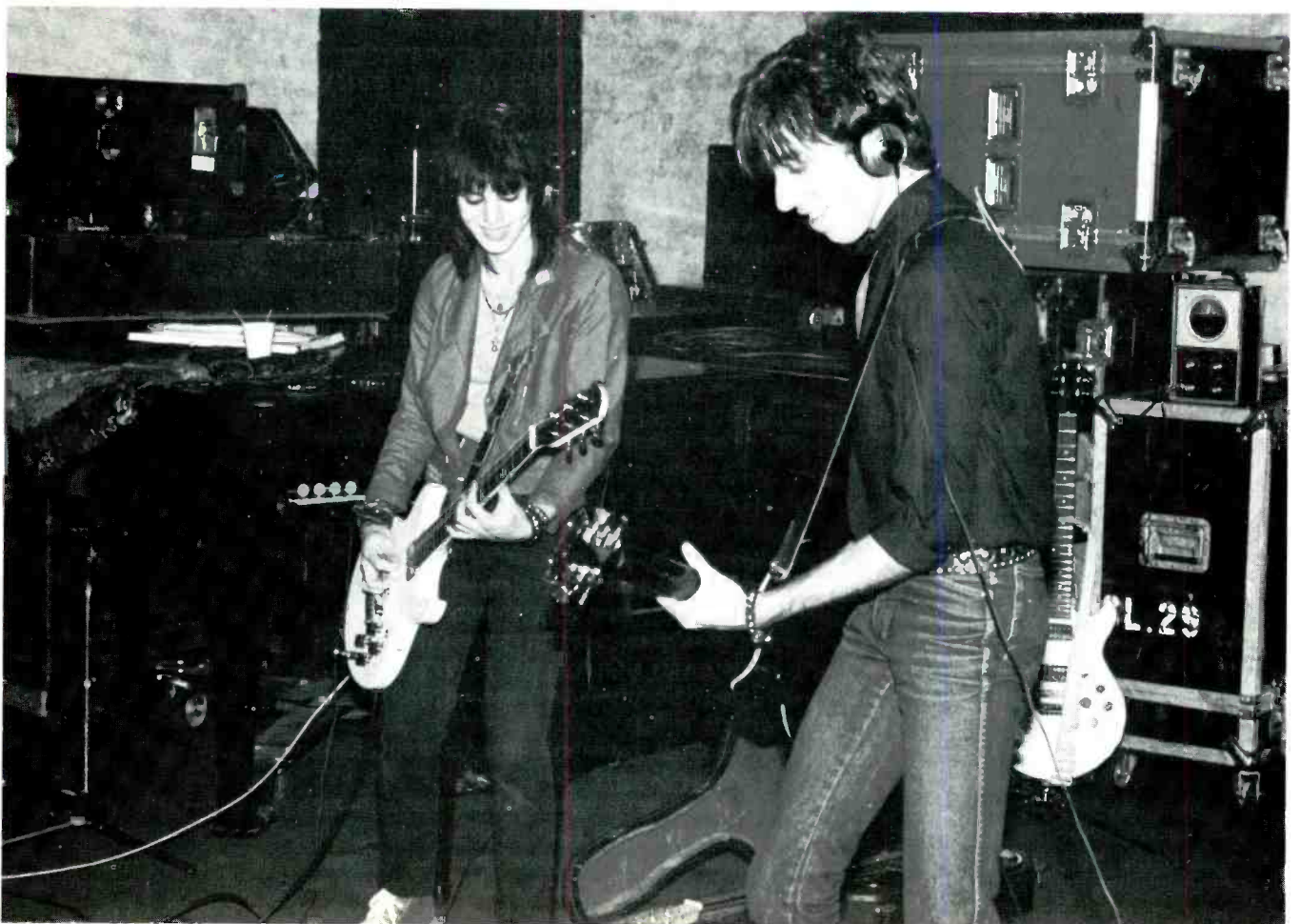
Jett keeps things aggressive and tough, but it's an assault in which the power lies more in volume and energy than edge. Hardly anything in the mix has a sharp clarity; the guitars buzz without bite, the bass thumps without punch, and the snare drum, even when playing a major part (as in "Handyman"), has its natural brightness toned down and echo applied. On this song, an almost baroque guitar break helps create a dynamic interlude in a forthright admission of passionate need.

The raw but smooth quality of the

instruments provides the perfect vehicle for Joan's gritty but strong voice. On some cuts, like the ballad "Why Can't We Be Happy?", Jett goes from her usual snarl to a scream, with the volume kept at the same level. On "The French Song," whose gourd accompaniment and amorous French lyrics add an exotic feel, the lead vocal is doubled by a breathily whispered duplicate line.

The album's two covers offer interesting versions of two classic rock tunes. Sly and the Family Stone's "Everyday People" somehow still gets a funky point across amidst the wall of power chords and undistinguishable background harmonics, and the old stomper, "Tossin' and Turnin'," gets a new lease on life from Jett's energetic treatment.

With the world being interpreted through this woman's tough but tender psyche, it's reassuring to know that the future of rock 'n' roll lies partly in some soft but strong hands. *Susan Borey*



Kingdom Sound Studios, Inc. Equipment List

CONSOLE

Trident TSM 40 in/32 out
Melquist Floppy Disc Automation

TAPE MACHINES

Studer A-80 MKIII 24 Track
Studer A-80 2 Track 1/2-inch
Studer A-80 2 Track 1/4 inch
Ampex ATR-102 2 Track 1/2 or 1/4 in.
Ampex 440 2 Track 1/4 inch

MONITORS

Big Reds 604-E2
UREI 813 Time-Align
Yamaha 10-M
Auratone

POWERED BY

Crown DC300A
Crown DC150
BGW 750
Phase Linear 400
White 1/6 Octave EQs

NOISE REDUCTION

24 Track Dolby A
2 Track Dolby A
2 Track dbx

CUE SYSTEM

Selectable to:
4 Channel Mono
Double Stereo with individual
mixing boxes

ECHO REVERBERATION

EMT 240 Gold Foil with Remote
EMT 140 Plate with Remote
Lexicon 224
AKG BX-20

OUTBOARD EQUIPMENT

EQs
(1) UREI Digital Metronome
(11) API 560
(4) Orban Parametric
(4) Pultec Full Range and
Mid Range

COMPRESSORS/LIMITERS

(4) dbx 160
(4) UREI 1176
(1) UREI LA-3A
(1) A&D F760-X Compex Limits
(8) Kepex II

EFFECTS

Eventide Phaser
Eventide Flanger
(3) Eventide 910 Harmonizer
Eventide 949 Harmonizer
MXR Flanger
Marshall Time Modulator
Lexicon Prime Time
(3) Orban De-Esser
(1) AAD DDL

MICROPHONES

Neumann: (2) U47 (tube), (2) U47

(FET), (4) U87 (with shock
mounts), (2) KM-86
Shure: (2) SM 56, (24) SM 57
Electro-Voice: (1) RE10, (2) RE15,
(2) RE20 (with Mount)
AKG: (4) 414EB, (3) D12E,
(1) D224E, (4) 452E
Crown: (2) PZM

INSTRUMENTS


Steinway 5'10" Grand Piano
Hammond A3 Organ with Leslie
Fender Rhodes (Dy-No-My)
Clavinet
Harpsichord
Rogers Drums
Zildjian Cymbals
Tympanis
Congas
Bongos
Percussion Chest

AMPLIFIERS

Ampeg
Fender
Marshall
Yamaha Bass
Acoustic
Marshall Cabinet (Celestions)
Leslie Cabinet (for guitar or
keyboards)


Joan Jett's *Album* engineered by Glen Kolotkin, Ron Cote and Rich Hilton.

To Sgt. Reed and his family—
USO is important



Look what USO is
doing today for
the Reeds!

Travel help at 25 airports,
assistance with family and crisis
problems through another 150 USO
locations worldwide and much
more... all made possible by
thousands of volunteers.



The three most
important letters in
helping others.

Joan Jett Live

JOAN: Music Man amplifiers (HD 130) & (212 HD 150) & speaker cabinets
(412B).

GARY RYAN: Ampeg SVTs through Ampeg SVT 8 x 10 speaker cabinets.

RICKY BYRD: Marshall 100W amps with Marshall 412 speaker cabinets
equipped with Electro-Voice speakers.

LEE CRYSTAL: Ludwig Drums: 24" bass drum, 14" x 16" rack Tom, 16" x 18"
Floor Power Tom, 18" x 18" Floor Power Tom, 8" x 14" snare. Cymbals—
15" Paiste high hats; 16" Paiste Thin Crash; 16" Zildjian medium Crash;
20" Zildjian Ride; 18" Paiste Rude (Crash Rude).

GUITARS

JOAN: Primarily white Gibson Melody Maker **Double Cutaway**; Backup—
brown Gibson Melody Maker.

RICKY: Black Gibson Les Paul; **Red** Gibson Junior.

GARY: Two Ampeg Basses. Primarily uses the **red** one. His **backup** is **blue**.

1/4 Notes



MR&M is beginning a new column this month. It's called "1/4 Notes," and it's our way of bringing you even more information about the recording industry.

As could be expected we get lots of "over the transom" stuff: studio releases listing who's laying tracks where, who's engineering and producing whom, new album info and concert schedules.

Most of these items don't fit into our already existing departments. So, instead of continually sneaking these news releases onto another editor's desk, we're opening up another category, in which we can pass along some of the more intriguing items that refused to be catalogued elsewhere. Some of these may be little more than short clips on newsworthy events, others may be extended comments about what's happening. If you have any ideas about what you'd like to see appear in this column, just let us know. We'll be waiting to hear from you.

Making Tracks

Simon and Garfunkle have been working to complete their first album together since *Bridge Over Troubled Water*. It's scheduled for a late summer release... **Three Dog Night** released their first album in eight years, *It's a Jungle*, on **Passport Records**... At **Boogie Hotel Studio**: **Blue Oyster Cult** finished up a new album for **CBS**. It was produced by **Bruce Fairbairn** and engineered by **Dave Whittman** and **Ken Kessie** with **Chris Isca** assisting; **Aldo Nova** is producing his new album for **CBS** with **Jim Sparling** engineering; **Southside Johnny and the Asbury Jukes** are working on their new release for **Atlantic Records**... **Bebe Buell** in **Bearsville Studio** with **Rick Derringer** producing and **Tom Edmonds** engineering; **Richard Gottehrer** is producing an EP for newly signed Bearsville recording artists **The Deal**; **John Jansen** is engineering... At **Sound Shop Recording Studios**: **RCA** artist **Leon Everette** cut his latest with producer **Ronnie Dean** and **Michael Bradley** at the board; **Larry Gatlin & the Gatlin Brothers** finished up work on a project with Larry Gatlin producing, **Stan Dacus** and **Mike Bradley** engineering; **CBS** artist **Chet Atkins** did string overdubs with **Ernie Winfrey** engineering... At the **Automatt**, **Angela Bofill** is co-producing her new album for **Arista** with **Narada Michael Walden**. **Leslie Ann Jones** and **Dave Frazier** are engineering... **Teruo Nakamura** is producing **Junko Ohashi's** album *Point Zero* for release in Japan. Tracks feature **Jorge Dalto** on keyboards and **Dave Sanborn** on saxophone. **Mark Hood** engineered with **Sal Ciampini** assisting... **Dennis MacKay** completed final mixes of **Al Dimeola's** new album, *Scenario*, at **Caribou Ranch**. The album features **Jan Hammer** on keyboards, **Tony Levin** on bass, chapman stick, **Phil Collins** and **Bill Bruford** on drums... Producer **Bill Haynes** recently upgraded and added strings to old **Willie Nelson** tracks for **RCA**. The album was mastered by **Randy Kling** at **Disc Mastering Inc.**... **Billy Sherrill** engineered the new album for **Katy Moffatt**, who is now signed to **Permian Records**. The album was recorded at **Sound Emporium** with **Jerry Crutchfield** producing... **Chris Blackwell**, founder of **Island Records**, has signed **Tom Waits** to the Island label. Wait's first album for Island is titled *Swordfish Trombone*, and is scheduled for release in September.

A Session With Chris Kimsey

by rob patterson

Why have the Rolling Stones sounded so good on their last three studio albums: *Some Girls*, *Emotional Rescue*, and *Tattoo You*? Trying to answer that question has helped pay the rent for many a rock critic, but among the many regenerative trends in the recent studio work by the World's Greatest Rock'n'Roll band, one major factor in the punch, sparkle, and street-smart sounds of those LPs has been somehow overlooked—the knob-twiddling hand of engineer and producer Chris Kimsey.

One reason that Kimsey has been seemingly ignored is in fact a compliment to his talents; the 30-year-old Britisher seems to eschew developing his own trademark sound in lieu of a versatility and devotion to developing an act's own personality. This fact is borne out by his work with a dizzying array of acts in studios everywhere from London to Paris, from Memphis to L.A. to Kingston, and many other points in between. In fact, Kimsey may well be the prototype for a new style of producer for the age—producers who no longer carry with them the myth of magic ("he'll fix it in the mix"), but instead are able to complement and enhance the act's own talents with solid studio technique.

Kimsey's experience belies his craft. Diving into production soon after leaving secondary school, Kimsey literally graduated from "tea boy" to tape-op almost upon joining Olympic Studios in London—perhaps the most noted and important independent studio in London in the late Sixties. His early experience includes assisting Glyn Johns on albums by the Eagles, the Faces,

Delaney and Bonnie, and finally the Rolling Stones (on *Sticky Fingers*). His engineering work at Olympic found him manning the desk for Mott The Hoople, Humble Pie and Spooky Tooth. Later, as a freelancer, Kimsey worked on such albums as Bad Company's *Burning Sky* and all but one of Peter Frampton's most successful solo discs (including his multi-million record breaking seller *Frampton Comes Alive*).

Kimsey's recording experience includes working in studios literally around the world: recording Spooky Tooth's Mike Harrison in Nashville; top French singer Johnny Halliday in Paris and Memphis; the band Piper (chartmaker Billy Squier's old outfit) in Los Angeles; songwriter Frank Carrillo at Massachusetts' Longview Farms; Jimmy Cliff's acclaimed *Special LP* in Jamaica (as well as Peter Tosh's *Mama Africa*), and Novo Combo's debut LP in New York.

His credits are as wide-ranging as his travels: past albums with Emerson, Lake and Palmer, Alvin Lee and Ten Years After, Widowmaker, Automatic Man, and Terry Reid; his recent work includes tracks for Marianne Faithfull's *Dangerous Acquaintances*, Billy Wyman's *Green Ice* soundtrack, and an album for new-wavers Fingerpritz.

One might say that Kimsey fits Robert Fripp's concept of the small, mobile, intelligent unit (albeit a chatty and gregarious one); a producer who seems to be able to work with almost any act in any studio. But of course, it's his work with the Stones that is perhaps most fascinating.

I always envisioned the Stones having such a live sound; not necessarily that large live sound, just the freshness of the live sound.

Modern Recording & Music: Let's start with your first studio experience with the Rolling Stones. Can you tell us how you came to work with them?

Chris Kimsey: I first met them when I was second engineer on *Sticky Fingers* at Olympic; I ended up doing most of the vocals on that. Glyn Johns was producing it with them—I can't remember what happened, but he couldn't make it—so I ended up doing most of the vocals. I was really nervous; it was terrible. Once we got underway, though, everything was fine.

Then I didn't hear from them until just before *Some Girls*. Up until then, Keith Harwood, who was a good friend of mine, also from Olympic, had engineered their last three albums. He died in a car crash, and I suddenly got a call to work with them on their next album.

I had just gotten back from the States and literally as I walked in the door the phone rang and it was Ian Stewart, who's their keyboard player and various other things, and he said, "Can you come to Paris to do the next album?" I said, "Oh sure...."

I went over and they were in Pathe Marconi Studios. There are three studios in the complex—two large studios, very large studios that can take about 150 musicians. Because it's EMI's studios, they're rarely used for orchestral sessions. But the Stones were rehearsing in the small room that had a 16-track, very old EMI console—the one with the quadrant faders. They were in there because nobody used that studio and they got a really good deal on it to rehearse in. In all the other studios they had big Neve desks. I walked in and sort of sat in for a couple of weeks while the band went over the material.

Then Mick said, "Well, we should start thinking about moving into the

studio (meaning the *other* studio with the big Neve) to start the album." I said, "Well, I think you should stay here. I think you sound *great* in this room." And they really did.

The room was a good 38 to 40 feet high and about 100 feet or more long. The floor was really interesting—it was a cross between a concrete and like a graphite floor, a very live sounding floor. Most of the ceiling and walls had been treated with acoustic wedges of different shapes to reflect the sound. The actual room itself was an odd shape. It wasn't square; it had one straight wall, then the side walls went off at different angles to each other, which was interesting.

So I said to Mick, "I think you should stay here—it sounds great, and everyone's comfortable." He said, "We can't use that, it's 16-track!" I said, "It'll be great...it'll be fun...interesting...it'll be a good sound for you." I felt with the albums just before *Some Girls* that the sound was getting too clinical, almost, for the Stones. I always envisioned the Stones having such a live sound; not necessarily that large live sound, just the freshness of the live sound.

MR&M: Tell us about that old EMI board. Was it an ancient tube model?

CK: The board wasn't a tube board. I thought it was at first. It was one of those early transistorized decks, although it still had a lot of tubes in it, because it really got hot!! You could fry an egg on it! And the EQ on it was quite interesting: it had treble—I mean, *that's* what it said, a knob for treble. It had bass, and it had a presence knob that had about four or five frequencies for presence. One thing that was quite unique about it, which not many desks have today—the only one I know of that's similar is at George Harrison's house in England—is that it had a limiter

and a compressor on each channel on the module.

MR&M: And the tape recorder?

CK: A Studer 16-track. The playback was really weird. The control room was a tiny room, and the speakers were on the wall at an angle to the desk, so the left hand speaker was closer than the right hand speaker. So it was a really strange sound. It was a very live sound; the bass end wasn't true at all, you would just know by the volume knob that the bass was enough—where it should be—but you had to turn it up loud on some tracks just to hear it. The monitors were JBL's, can't remember what model, and I didn't mix there.

I kept it all very similar to the rehearsals. I just put a few baffles between the drums and guitars. It was basically just a semi-circle with Charlie in the middle. To Charlie's right was Keith. Next to Keith was a guitar amp for Mick, because Mick played guitar as well on some tracks. Next to that was Bill's bass set-up. On Charlie's other side was Ronnie's set-up, then we had the keyboards next to Ronnie. We also had another speaker in an isolation booth hooked up to the bass so we could get some separation on the amp. They played pretty loud—which didn't bother me! They were quite amazed that I didn't run out and say, "Wait guys, this is all leaking into the drums, you've got to turn it down!" But I wasn't worried about that.

MR&M: Perhaps the best and most noticeable aspect of those three Stones albums is the crisp, powerful drum sound you got. How'd you do it?

CK: The floor was just so...it did something magic to the snare. I also used a technique I hadn't used up till then, which was mic'ing the snare from the bottom as well. On the bass drum, we used an AKG D-20 or an ordinary Shure Unidyne—an SM-57, I think. Charlie's kit is bass drum, one rack tom, one floor tom, a snare and three cymbals. The snare had another SM-57 underneath, and a Neumann KM-84 on top. On the hi-hat I used an AKG 451; on the toms, a Neumann U-67. Then one overhead mic which really added to the drum sound—a tube U-47. There was one great thing about the studio. Since it was EMI and one of the most established studios in Europe, it had one of the most incredible selection of microphones.

MR&M: What about that great live-sounding echo on the drums?

CK: That came from... well, I also kept the PA they were using for rehearsing to put the drums through, because the guitars were so loud that nobody could hear Charlie when they started playing. So I said, "Fine, we'll just put the drums through the PA." It was one of those Shures with the two thin columns. So that was basically the drum sound. We also put the vocals through the PA on a few things. In fact, on "Miss You," if you really, really listen, you can hear in one spot—because Mick changed around the lyrics—you can hear a ghost vocal, and that's the PA. The reason we did that was because it just created a nicer atmosphere to play. It was almost like doing a live thing. You can sing through the PA and it takes the pressure off of feeling you're in the studio doing an album cut.

MR&M: What about recording Mick's vocals?

CK: I used a U-47. For the live vocals... I don't think we used any of the live vocals, because when we were cutting the tracks, Mick didn't really have all the lyrics—maybe a verse and chorus, so he might want to change it later. So we just threw up an SM-57 for those on the PA.

Working with Mick, and doing what I do all the time, is very interesting because he's the most in-tune singer I've ever worked with. He's never out of tune when he sings—which is quite amazing, because a lot of people have trouble overdubbing because of the headphone mix. When we were cutting the vocals, I didn't use headphones. I used like bookshelf speakers, very close to Mick, and out of phase with each other so the leakage would be minimal. We equalized them a bit so there wouldn't be a lot of bass and high top.

MR&M: How about mic'ing the instruments?

CK: Keith and Ronnie both played through Boogie amps. Keith uses an MXR digital delay quite a bit. On both Keith and Ronnie I used U-67 tube mics again. That was it for them.

For Bill, direct, then in the booth, he had an Ampeg on the first dates, and I used an AKG 414. On the piano—two 414s, and a pick-up, a Cerwin-Vega, I think. On the organ—an AKG D-20 and a U-47 on the top of the Leslie. Bobby Keyes came over for a while, and I used a U-67 on his sax. And Ronnie was playing sax a

lot, too, because his wife had bought him a sax for Christmas. He's incredible—the type of guy you can give an instrument to and within a week he's playing it.

MR&M: With only 16 tracks, you obviously couldn't spread the drums across a bunch of tracks.

CK: I recorded the drums on three tracks—the bass on one, the snare on another, and the whole kit on a third. So I got the drums in mono, which is what I thought Charlie's drums should sound like, because it's a bit stronger sounding. A lot of people were amazed at the drum sound on just three tracks. But it makes it harder; possibly gives it more definition, as it were....

MR&M: How hot did you cut the tracks?

CK: We usually recorded at plus four, and then I know the tape can take three or four dB on top, so you can run in the red as long as you're not distorting the output of the board and the input of the machine. The Studer's very good for that; you can put any level on a Studer, and it'll record it.

MR&M: Since this is the Rolling Stones we're talking about, I imagine the studio atmosphere was as hot as the tracks.

CK: You'd get an audience that would come down, a different one every night. Friends of Mick, friends of Keith.... Being in Paris you'd get quite a lot of fashion people—people who like to be seen with the Rolling Stones. So you'd get quite an audience; it was quite fun. We'd set up a little bar to the side, and people would just sit around watching them play.

It's interesting, in a way—Keith and Mick are one entity in the band, and Bill and Charlie are another part; Ronnie is there in the middle of it all. Bill is obviously very quiet; he'll just sit there and play. Occasionally he will come up with some ideas. Charlie hardly says a thing. He just sits there and plays. He's incredible. I sat and watched him one night; he sat at his drums for eleven hours. He didn't move. He went to the toilet and that was all.

The session would start with Keith or Mick—depending on who got there first. If Keith got there first, they'd start working on one of his songs and as everyone arrived they'd join in. If Mick was first, they'd start into one of his songs.

MR&M: They also did some re-

ording at Compass Point in the Bahamas. right?

CK: *Some Girls* was done totally in Paris. *Emotional Rescue* was started at Compass Point. We didn't stay there very long; it was quite some time, but not in Rolling Stones terms—about a month and a half. It was a very small studio; that was one thing I didn't like. I didn't really have much say in where we'd do it. It was basically where the band would be at the time. Compass Point is a very small studio compared to EMI—anything would be small after that room. So it was a little uncomfortable, because they do like to have a lot of space to move around. Mick loves to dance when he's singing. It's like watching a show every night. And Keith's always jumping up and down. But what slowed it was that Alan Dunn—who's Mick's right-hand man—was lost at sea for three days in a dinghy. He went out on a little trip with his girlfriend, and the engine konked out while he was going around the island, and before he knew it, he drifted over the reef around the island and was lost. So we all went in planes and boats looking for him. He was found, and okay, but that dampened the sessions a bit.

MR&M: I understand there's still some tracks in the can from the last three albums.

CK: There's still a lot of tracks left. I went through everything to sort out the material for *Tattoo*; I think there's at least fifteen more tracks.

MR&M: Let's talk about some of the tracks on *Tattoo You*. For instance, "Slave" sounds like a hot studio groove embellished with lyrics later on.

CK: Originally that track was about 14 minutes long. It is very much a groove thing. Mick will sort of start with that, and maybe add or change the lyrics months later.

MR&M: What about "Start Me Up"?

CK: We cut that just after "Miss You." As I recall, there was pretty much a complete vocal on that when we cut it. Not a lot was changed. When we were cutting it, the audience we had would go crazy when they started playing the song, jumping all over the place.

MR&M: "Heaven" is an interesting and different track—almost psychedelic.

CK: I read a review that said it was a very drug-oriented song, and the band had gone back to their days of

LSD. But actually, Mick wrote that song just as he was getting very much in love with Jeri (Hall). I think the song is very much for her. The song started one night when Mick was at the studio first. Charlie was there, and I was there, and nobody else showed up for hours. So Mick started playing the chord sequence on it, and Charlie started the drums, and I sat down and started playing piano on it. Next thing we knew, it was sounding really good, so I said to my second engineer—"Take it!" He did, and it started with just the three of us. From there we didn't touch it for ages. Then we put a bass on it, and sent it to Bill, who was working on the *Green Ice* soundtrack. He put the synthesizer sounds on it. We basically told him what we wanted—some wind sounds. He also put percussion on it—we used Ray Cooper on that. Then we got the tape back and started doing the vocals. The vocals were very interesting—I was using a lot of repeat echo on the song and recording it. But I was cutting it at the same time on the same track. So the echo was giving Mick the inspiration to play around with the sound of things. We ended up with about four or five vocals, and then changing and mixing between all of them, because the track really floats. It was a spacey song to do—great fun.

MR&M: How about some of what sounds like Keith songs—"Little T&A," "Neighbors"?

CK: "Neighbors" is a Mick song, but I think it's for Keith. "Little T&A"—the original title for that was "Bulldog." That was cut around "Emotional Rescue" time, I think. I always loved that track. "Little T&A," "Neighbors," and "Hang Fire" were all cut about the same time.

MR&M: You weren't involved in the later polishing stages of *Tattoo You*. Why was that?

CK: I was in the middle of doing *Novo Combo*, but they [the Stones] wanted to mix the LP because they were going on the road. So I made an attempt to mix the album in four days, which didn't turn out so well. Then Mick got ahold of Gary Lyons, and had him mix a couple of songs. Gary did a great job, but he had the opposite problem—he was taking too long for Mick. So I suggested to Mick that he use Bob Clearmountain, who did the disco mix of "Miss You," and ...he's very quick.

MR&M: You've also worked with Bill Wyman. What's that like?

CK: He's so different from the rest of the band. Bill doesn't really get to show his forte with the band—his songs and ideas, like on "Heaven." Mind you, "Heaven" was a very good vehicle for that. You couldn't put a bunch of synthesizers on "Start Me Up." But Bill is really coming into his own. He works very differently. He lives in the south of France, and has his own little studio there. He'll cut the basic tracks on an eight-track with a rhythm machine. Bill plays terrific synthesizer and keyboards, and so when he fills up his tracks with what he wants down, he'll come over to the U.K. and we'll transfer to 24-tracks and go on from there.

MR&M: Where do you and Bill work in England?

CK: A place called The Sol. It used to be Gus Dudgeon's studio, but now it is owned by Jimmy Page. It's really a lovely studio.

MR&M: Of the many studios you've worked in, do you have any favorites?

CK: EMI in Paris is one of my favorites because of the size of the studio, the room sound. The Hit Factory in New York is one of my favorites. But, that's a very small room. Even though it's small, I can make it sound large. I really enjoy the staff there—very pleasant to work with. That's an important factor to me—having a good staff who help you and you can get along with. In L.A. there's this big Wally Heider room that used to be RCA studios; I like that because of the size of the room. And I've been working at the Village Recorder, which is a great place.

In England, I've worked in Air a few times and I really like that. I worked in Abbey Road—that was interesting. The Sol is also one of my favorites. It's built into an old mill out in the country. All of the machines are set in polished wood cabinets. It's fancy but not too fancy. It has a beautiful wood floor and a lot of beams everywhere. And I still like Olympic.

MR&M: I assume that when you started at Olympic, the equipment was as basic as that EMI room in Paris.

CK: When I started there they'd just got an eight-track—a big coup! There were three studios there: a small one, a mixing suite, and the big studio, which had a 40 to 50 foot ceiling and a 3M eight-track. About three years later they bought a 16-track. They built their own console. Pretty similar set-up to EMI, al-

though the Olympic desk had a lot more on it—two or three top variables, not just treble.

MR&M: You certainly seem to be versatile in your studio work.

CK: I'm happy going from studio to studio. Just give me a mic and a piece of tape—I'll get it on there. I have a way I'm recording albums now where I use two 24-tracks. What I do is record all the effects at the time I do the track. If we decide we might want a harmonizer on the piano, I record just the piano on one track, and the harmonizer on the other. So, you can hear the sound you're going for as soon as you're done. It's a question of knowing...well, we won't know what it will sound like until we mix it. It does sound different if you record it later. Also, it's easier as well. You've just got it there all the time.

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MR&M: How does it feel to have worked with the band most producers and engineers would give anything to get in the studio with?

CK: It freaks me out that some producers and engineers would chop off their right hand to work with the band, but for me it happened so naturally. A lot of people would have a problem working with them. You've got to accept the fact that you've got to get it live. You can't say "Stop, this is leaking!" So I think there's a certain knack to working with them—getting down what's happening. I'm happy as I am, but I would like to get into writing a bit more. And I'd like to work with Elton John. I'm working on getting a whole bunch of material together for an album for him, although he doesn't know about it...

Book Review

by ken pohlmann

Critical Listening: An Audio Training Course

Book at a Glance:

title:

Critical Listening: An Audio Training Course

author:

F. Alton Everest

publisher:

S.I.E. Publishing, P.O. Box 4139
Thousand Oaks, CA 91359

vital statistics:

paperback manual of 108 pages,
5 cassette tapes,
price \$129.95

After spending about twenty years on the receiving end of the classroom, and another five on the delivery end, I think I have a modest idea of what education is all about. I can tell you that there are no shortcuts in learning; only enthusiasm and perseverance will bring meaningful rewards to the student. And to aid him in that endeavor, the instructor must apply a unique combination of patience, insight into human personality, and, of course, depth of understanding. I think that any course lacking a teacher's direct input can succeed only through a rare combination of forethought and cunning to properly anticipate the student's needs and respond to them in a prepackaged manner. Although a well-written computer-assisted course can provide this sophistication of response, a simple training course must aim for more modest results. With the proviso that no off-the-shelf course could ever replace good classroom instruction, or hands-on experience, let's see just how far this Critical Listening course can go.

The Course

The Critical Listening course consists of a manual of about 108 pages and five cassette tapes, each with two listening lessons varying in duration from about ten to twenty minutes. The manual parallels the listening lessons, with the spoken text reprinted in the left column and applicable graphs and drawings detailed on the right. The ten lessons are collectively organized to move through the fundamentals of listening to more advanced discernments. As the following summary shows, a wide variety of topics are discussed and audibly demonstrated.

The first three lessons are concerned with developing the ability to estimate the frequency of sound, sound level changes, and frequency bands. Topics covered include: frequency, octaves, pure and random tones, bandwidths, the decibel, sound levels and loudness changes, and distribution of energy in speech and music. Lesson Four covers frequency response irregularities and the effect of frequency response on different sounds as well as the effect of tone controls, and the directivity of sound. Lesson Five teaches judgement of sound quality with emphasis on fundamentals and harmonics, simple and complex waveforms, and the nature of musical instrument waveforms. Lesson Six provides training for the detection of distortion, including non-linear distortion, clipping, THD as well as wow and flutter. Lesson

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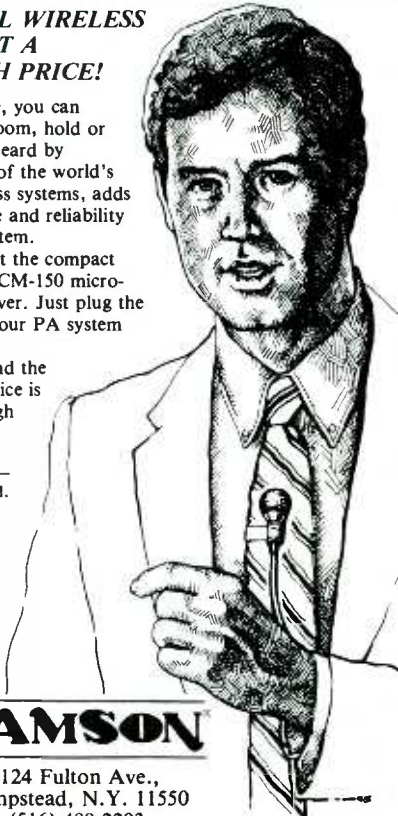
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Seven examines reverberation effects including indoor/outdoor differences, intelligibility and masking. Lesson Eight examines signal-to-noise ratio and noise sources such as circuit noise floor, hum, crosstalk, induced noise, and audience noise. Lesson Nine illustrates voice colorations from acoustical effects of direct versus ambient sound, and comb filter reflections. Lesson Ten is a review of the preceding nine lessons, with ten music selections—each with one fault artificially introduced.

Each lesson is internally organized to introduce the topic at hand, and then expand its discussion to peripheral topics. At convenient stages, topics are reemphasized; review material is included to further drive home the subject matter. For example, Lesson Nine deals with voice colorations in the following manner: First, the effect of the variability of source-to-microphone distance is illustrated by repeating a spoken phrase six inches from the microphone, then at three feet, and ten feet from the microphone, then correspondingly back again. Room characteristics are shown to be more prominent as distance increases and the ratio of direct to ambient sound decreases.

The experiment is repeated in a room that is acoustically more live than the preceding—even at a distance of six inches the room's lively characteristic is audible. Similarly, at distances of three and ten feet the effect is increased. The lesson notes that room acoustics and microphone placement are important considerations in the recording environment.

In the next experiment, the microphone is held at a constant six inches, but the narrator faces a sheet of plywood and, from a distance of ten feet, walks toward the reflective surface. The combining of direct and reflected sound changes as the distance between narrator and surface varies. Similarly, if the narrator stands beside the plywood, the microphone receives the direct sound and a reflected sound, which because of longer path length is delayed by perhaps a thousandth of a second. This delay is shown to be the cause of the familiar comb-filter response.

Different delays are auditioned, and it is shown that the effect is most noticeable as the delay is altered in real-time. Coloration is also produced if the same sound strikes two microphones separated in distance and their outputs are combined; the phase differences yield the same comb-filter response. The lesson concludes with a listening test in which ten selections are played, each with one of the eight coloration culprits previously discussed.

Critical Listening is thus a methodical demonstration of the fundamental properties of sound, especially as concerning the recording of sound. As the author notes in his preface, it is only through long years of listening, with subliminal yet precise experiencing of thousands of listening events—and the evaluation of the cause and effect of altering the experience and listening again—that the ear's acuity can be fully developed. However, it is the author's contention that a listening course can, if not replace, then at least accelerate this process; a structured approach should increase the efficiency of the otherwise random method. That thesis is correct, and indeed forms the basis for any pedagogical endeavor. There is no question that communication and retention can be aided by the kinds of methods used in this *Critical Listening* course. And yet the perspective of this

course must be kept carefully in mind. If years of careful listening are required to accumulate sufficient experience and acuity to make reasoned and aesthetic sound evaluations, then the limited benefit of listening to two hours of tutorial is obviously clear. While this course can be invaluable for the amateur enthusiast or the aspiring professional, its limitations confine it to the most elementary lessons of hearing acuity.

In my experience as a professor of music engineering, I have been made acutely aware of the slow nurturing of good ears. After working with a group of students for four years or more, I am usually rewarded to find that only in one or two individuals has a real talent for hearing emerged. The point is that our listening evaluations are intensely personal and are based on psychophysical sensations which are perhaps the most difficult to access and discipline. While I have seen a few natural listeners walk into the studio, I am convinced that, for most of us, the skill was acquired only through years of painstaking random experimentation. Moreover, I can imagine nothing which could easily expedite that process.

Thus this *Critical Listening* course occupies a curious place in my opinion as an engineer and teacher. I admire its clearly stated explanations of principles, nicely demonstrated aural effects, and most of all, its pedagogical construction. In short, I admire how it tries to accomplish its end. On the other hand, I understand the magnitude of the problem of developing one's hearing acuity, and thus understand the relative benefit of *any* education with respect to the need for one's own discipline, patience and diligence—listening to music endlessly and evaluating what is being heard constantly.

Recommendation

My recommendation of *Critical Listening* is thus primarily to those who are beginning the process of acquiring the art and skill of good listening acuity. This course will help you to identify many of the properties of sound, and link them with the nomenclature used in the industry. I suggest that each lesson be carefully completed, repeated several times, and supplemented with a good recording studio handbook. It will teach you a lot, but after you've mastered the course, bear in mind that the development of your skills has just begun. On the other hand, be comforted that this course has started you off correctly and taught you how to *learn* to listen.

And what if you are a fairly experienced recording engineer, perhaps located in a small studio, perhaps always a little dissatisfied with your mixes? Then you too might want to try *Critical Listening*. Perhaps it will help you to uncover some fundamentals which somehow escaped your notice. Perhaps that little bit of insight into the discipline of listening will rekindle your resolve to *work* at listening; it's never too late to reevaluate your habits with the aim of improving them with new methodology.

And if you're an experienced engineer with thirty gold records on the studio wall, would *Critical Listening* teach you anything? Probably not. And with thirty gold records, even if you're hearing everything wrong, for God's sake don't learn how to hear it right! The most valuable listening lesson of them all teaches us that everything is subjective, and beauty lies in the ear of the beholder.



Studio Notebook

by james rupert

I'd like to begin this month's installment by changing the subject. Before we get down to brass tacks about leasing vs. buying for your new studio, let me send out a rousing round of cheers for those who have taken the time and initiative to enter the Modern Recording & Music 'Design-A-Studio' Contest so far. It seems by beefing up the prizes in the contest, we've beefed up a lot more entries as well! Even though we've received some super ideas from MR&M's faithful readers, there's still time for you to stake your claim for a great lineup of equipment to be given away by such fine companies as JBL, Shure Bros. Inc., B & W and more. (Good stuff, Maynard!) Check out the April '83 issue for full details and send your entries to Modern Recording & Music by no later than September 30, 1983, to insure your eligibility. Somebody's going to win a load of terrific gear and why shouldn't it be you?

Now back to our story. When we left you last time we were all uncomfortably poised on the horns of the leasing

or purchasing dilemma. The sign in the window of the building you're considering for your new studio complex says, "For Sale Or Lease." One way or the other the landlord is going to be standing there with his hand out ready to have his palm crossed with silver. The decision to lease or buy the facility should be based on several factors:

1.) Are your studio's requirements going to be changing as you (hopefully) expand over the next few years? If you think you'll be needing more room to grow, then leasing is definitely something to consider.

2.) How are you sitting for money reserves? Could you better use your available funds in a building, or in some extra equipment? Is there any other use your capital could be put to that would bring you a better return (investments, bank interest)? Does it boil down to a choice between buying or purchasing other needed business supplies that you must have in order to operate? If money is ultra-tight for you, then once again leasing may be preferable.

3.) Does the landlord/property holder have any preferences? Because of tax considerations, the owner may prefer to lease the business property instead of selling it outright. If this is the case, he might be hot to make the lease price more attractive than the selling price. Seize the moment and see if the landlord will agree to a favorable lease with an option to purchase. In this way you might be able to grab the best of both worlds. Perhaps some (if not all) of the monthly payments can be applied to the final purchase price. Perhaps for the first year or two a portion of the lease monies may apply as a down payment so you will not have to slap down a huge amount initially. (Lease/purchase agreements are very common with all types of property, so don't think that you will be bowling the landlord over with a revolutionary new concept.) Whatever you decide upon, spend a few bucks to have your attorney review the agreement and fully explain your obligations and privileges under the contract. A landlord can promise you the moon while you're trying to come to terms. Just be sure to get it verified in writing before your name hits the dotted line.

4.) Before you decide anything, talk to an accountant. Your accountant can best advise you on how the financial aspects of leasing and/or purchasing the property in question will affect your financial picture. If your accountant feels you can buy the property at a favorable price without blowing an irreparable hole in your working capital, then purchasing may be just the ticket for you.

5.) Consider the resale of the building and land. Is the building one that can be readily resold or subleased? Is it in an area where other businesses are doing well? Although it may be swell for a recording studio, can the building be adapted for use by a wide variety of other

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companies and applications? What is the economy like in your city and area of the country? If all the answers look good, then purchasing may be a wise decision. On the other side of the coin, leasing may be better if there is something about the property that would hinder or limit its resale. Does it have adequate parking or does it just depend on metered on-street parking for its customers? Is there any adjacent land to the building that would allow for expansion in the future? Once again, look down the road a bit before you commit yourself to a regrettable business agreement.

6.) Check with Uncle Sam to see what kinds of assistance programs are available in your state. Some states have revenue bonding programs, tax forgiveness and other special assistance programs for business property owners. Contact your state or local economic development group to determine what help is available to you.

There aren't any hard and fast guidelines to use in determining leasing vs. purchasing. It all depends on you, your own cash flow and available capital. Make the right choice and it can turn into dollars in your pocket now and in the long run. Choose wrongly and it can spell disaster. Let us stress again, don't be afraid to seek the counsel of both your attorney and accountant when taking a step as major as securing business property.

If you have also been considering leasing the equipment you will be using in the studio, you'll be faced with a whole new set of problems. Recording gear can be leased through several companies in the U.S., but it's not quite as simple as walking into a showroom and saying, 'I'll take that-and-that-and-that!' First and foremost, you will have to have a verifiable and good-as-gold credit rating for yourself or your business. We will assume that your credit rating was good enough to get you the bank and/or Small Business Administration financing that we discussed several months back, so there's no problem there.

From this point on, many of the same questions that arose during our discussion of business property leasing/purchase will raise their ugly heads along with a few new sourball problems. For the sake of convenience, we've separated the advantages and disadvantages of equipment leasing into separate categories for a quick overview. Let's begin with the advantages:

1.) The most obvious advantage is that the studio acquires sizable assets without a large outlay of money. If you compare this to a loan arrangement to buy the same equipment, a lease will require no chunky down payment while a loan will often require 25 percent or more down. A lease will also often enable you to spread payments over a longer period than loans permit. (This can mean lower monthly payments and much less heat on your cash flow during that critical start-up period.)

2.) Since you can get rid of the equipment at the end of a lease period, you are protected against equipment obsolescence. If you have kept on current and friendly terms with your leasing company, you can just bring in an entirely new studio set-up from them if you have lived up to all terms of the lease contract.

3.) There may be tax benefits in equipment leasing. If the arrangement is a true lease and not a lease/purchase agreement, all payments are deductible as an operating expense. If at the end of the lease you can purchase the equipment for a dollar (part of your monthly payment is in reality interest on a sort of quasi-loan arrangement), then kiss the tax deductions

goodbye. On the other hand, if you can buy the equipment at the end of the lease period at a fair, albeit "used," market value, then everything is hunky-dory again.

4.) Some leasing companies offer their expertise in helping you select the right gear for your individual needs, just as a retail dealer would. Expert technical advice can be yours for the asking, based on their experience with the products they lease.

5.) Finally, leasing offers one advantage that (knock on wood) you'll never have to use. In case of bankruptcy, the claims of a lessor to the assets of your studio are more restricted than general creditors. Roughly translated, this means: If your business goes "white-side-up," the guys who were leasing equipment to you can't make your life quite as miserable as they could if you were buying it from them on credit.

Now before you all start making a mad scramble for the nearest leasing agent's office, let's take a look at some of the disadvantages:

1.) While leasing may offer tax benefits, buying the equipment can also offer definite tax advantages. Ownership tax advantages can usually be gained through the investment tax credit and depreciation. This is more of a "long-run" consideration because there has to be enough profit and income before these deductions start to mean big tax savings. Beginning studios usually are not making enough profit to make taxes a critical factor initially.

2.) Since you do not own the leased asset, you lose the economic value (resale value) at the end of the lease term. When the lease is over, the equipment either goes back to the lessor or a new lease is negotiated. If the equipment is bought outright, you can sell the gear for a further return on the money invested in it, beyond the profits the equipment has already made.

3.) Remember that a lease is a long-term legal obligation that usually cannot be cancelled. If you are leasing cassette duplication equipment and decide to phase out this aspect of your studio operations, you will still be liable to either pay off the lease to the end of its term or pay a penalty charge. In some cases, this will almost equal the balance of the lease fees. (And keep in mind that the equipment is not yours to sell to somebody else to raise the money to pay off the lease contract!) If you own the gear and get yourself in a money bind, you could raise money to try to weather a financial storm by selling the least-used pieces of your set-up. Try and sell a leased unit and it's Felony City!

So there it is in the smallest of nutshells. For more detailed information, I will make my usual recommendation that you give your friendly neighborhood SBA office a jingle or pedal on down to your local library to get the full particulars. Whatever you decide, put a little thought into all of your options before you buy the farm. If you decide to lease, check with several leasing companies to see who is willing to offer the best prices, terms and service. Find out the lessor's reputation and financial condition if you can. Above all, remember that once the deal is cut and the ink is dry, even Houdini couldn't change so much as a dot on an "i."

As for me, I'll be wading through all the entries in the 'Design-A-Studio' Contest for a while. (I should be out by the middle of October or so.) If some future entrant in the contest would please include a hamburger with their entry to hold me over, I'd be much obliged! Hold the onions and try to make the pickle kosher, will you?

See you next time.

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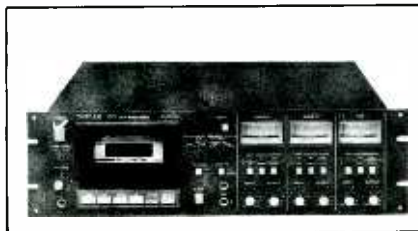


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dard RS-426) due to new heat-resistant voice coil materials and proprietary manufacturing techniques. The computer-designed woofer and optimally-vented enclosure make for a combination of small size, extended bass response, high-frequency response, and low distortion. The S-200's crossover network is a 12 dB/octave dual section type with the crossover point occurring at 2 kHz. It can be used with or without an external equalizer. Without an external equalizer, the S-200 has a frequency response of 90-18,000 Hz \pm 3 dB. The optional active equalizer expands the capabilities of the system, resulting in a higher output level with the bass response extended to 50 Hz. A third equalizing possibility also exists, that of switching to the high-output mode without the active equalizer. This allows the S-200 to be used as a floor monitor. In addition to the active equalizer, a number of accessories are available. They include the 100T telescoping speaker stand, VPC200 vinyl cover, WB100S wall-mount kit, and GS200 grille screen without the EV logo. The Stage System 200 is available at a suggested retail price of \$589.00; the cost of the S-200 Active Equalizer is \$149.00. The special price for the complete system—two speakers and the equalizer—is \$1295.00.

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TASCAM UPDATES



Tascam has recently revised their model 133 and 122 Cassette Recorder/Reproducers. The 133-B is a balanced version of the 133 three-track deck, containing electronically balanced XLR input and output connectors for the two audio tracks. It is fully compatible with high line-level balanced systems and low line-level unbalanced systems. All other specifications are identical to those of the original 133 model. The 133-B is suitable for multi-image, broadcast production, and on-air applications. Two tracks are used for recording sound; the third track is used to record internal 25 Hz cue/control tones, external control data, or FSK (frequency shift keyed) codes. All three tracks come equipped with unbalanced RCA input and output jacks and operate at -10 dBV. The switch selectable 0 dBV medium output level is no longer needed because the 133-B's XLRs deliver +4 dBm nominal level. Standard features include input level controls for mic/line use and individual record switches for dubbing one audio track at a time or for adding or editing cue/programmer tones after the audio tracks are completed. Each track has output level controls with a separate stereo headphone output and two switchable types of signal conditioning on the cue track input. The deck includes built-in Dolby and facilities for optional dbx tape noise reduction, and two record/play speeds.

The 122-B is a stereo cassette deck for recording/broadcast studios and sound reinforcement systems, having unbalanced -14 dBV nominal level RCA input and -10 dBV output jacks, and unbalanced phone jack inputs. By adding balanced high-level XLRs, the 122-B becomes fully compatible with low line-level unbalanced systems and high line-level balanced systems. All other specifi-

cations and features are identical to the original 122. The 122-B has front panel bias and record level calibration trimmers, and presets for normal, chrome, and metal tape. A three-head design allows simultaneous off-tape monitoring during recording. Other features include adjustable stereo headphone outputs, built-in Dolby noise reduction and Dolby HX headroom extension, plus facilities for optional dbx tape noise reduction.

Both the 133-B and the 122-B run at 1 7/8 ips for longer programs or at 3 3/4 ips for high-fidelity. In both models the transport utilizes a DC servo-controlled capstan motor for speed accuracy with low wow-and-flutter. They drop into Record or Play instantly, and because the outputs remain live, Pause mode may be used for manual cueing. The capstan motor is off in the stop mode, contributing to longer life.

Circle 41 on Reader Service Card

NEW JBL LOUDSPEAKERS

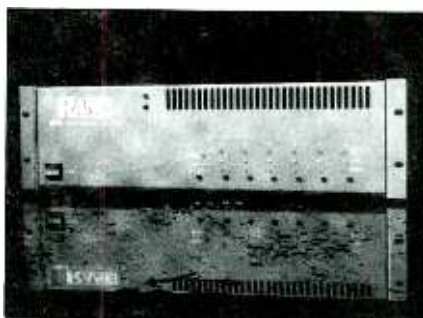


JBL's three new MI Series loudspeakers come in 10-, 12-, and 15-inch configurations suitable for use in keyboard, guitar, or P.A. systems. Incorporating the latest advances in transducer technology, the MI Series models feature die-cast frames, precision-wound flat ribbon voice coils, and JBL's Symmetrical Field Geometry magnetic structures. The three-model line has been specifically designed to offer a choice in tonal quality between JBL's traditional "hot sound" in the E Series musical instrument speakers and the cooler, even response of the MI Series

speakers. In addition, the MI Series components provide greater power-handling capability, efficiency and durability, making them useful for a wide range of live performance applications.

Circle 42 on Reader Service Card

MULTI-CHANNEL AMPLIFIER



Rane Corporation's MA 6 Multi-channel Amplifier has six separate channels, each delivering a minimum of 100 WRMS into an 8-ohm load, and 150 WRMS into a 4-ohm load. With built-in automatic bridging, the MA 6 delivers up to three channels at 300 WRMS each into 8 ohms. All six channels include built-in limiters for 20 dB additional headroom before clipping; separate output relays; auto balanced/unbalanced transformerless inputs; signal present, limit, and clip LEDs, and terminal block output connectors. The unit is packed into an all-steel chassis measuring 5 1/4-in. high by 19-in. wide by 11 1/2-in. deep. It is fan-cooled and EIA rack mountable. The MA 6 is suitable as a monitor mix amplifier, bi-amplifier, or tri-amplifier. It carries a suggested list price of \$1,199.

Circle 43 on Reader Service Card

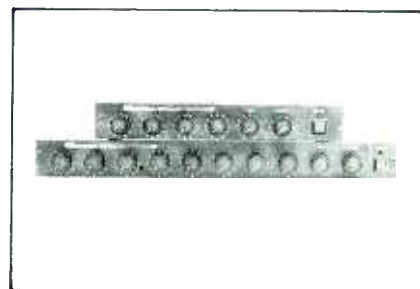
UNICORD AND KORG MONITOR AMPLIFIER



Unicord and Korg's MM-25 Monitor Amplifier is designed for portable amplification of guitars, keyboards, and line level sources such as mixers and tape recorders. It combines a 25-watt amplifier with a front-loaded, bass reflex speaker enclosure to produce a compact, lightweight system suitable for a variety of applications such as practice amp, stage monitor, or miniature PA system. The built-in function selector allows easy selection of different input and amplifier characteristics to match an instrument or other input source. Included selections are line level, keyboards high and low, guitars, microphone, and guitar distortion. Other controls include input volume and high/low equalization. Line inputs and output are provided for easy connection to a mixer or tape deck. Two headphone outputs are also included, one of which turns the speaker off for private listening.

Circle 44 on Reader Service Card

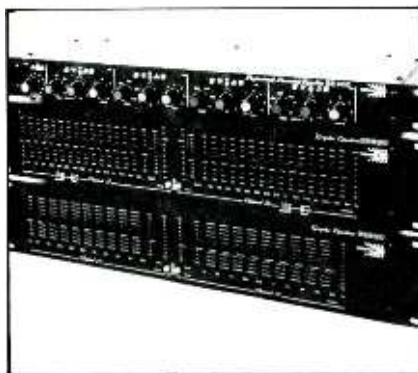
EDCOR UTILITY AUDIO MIXERS



Edcor's new series of utility audio mixers are suitable for many applications. Inputs are selectable between microphone or line level, balanced or unbalanced. The MX 100+ has four inputs and one auxiliary input; the MX 200+ has eight inputs and one auxiliary input. Both mixers have balanced microphone or line level outputs and unbalanced monitor outputs. Frequency response is better than 0.5 dB from 20 Hz to 20 kHz, and distortion is less than 0.5 percent THD.

Circle 45 on Reader Service Card

THREE NEW EQUALIZERS



Biamp Systems' EQ/140 is a single-channel, four-band parametric equalizer designed to function at very low levels of noise and distortion. Its highly flexible equalization makes it suitable for portable or fixed sound reinforcement, studio recording, broadcast, and monitor speaker set-ups. The EQ/140 features fully balanced inputs and outputs, ± 16 dB range (-40 dB for feedback tuning), 5 LED overload indicators, and end channels convertible to shelf mode. It measures 1 $\frac{3}{4}$ -in. high in a standard rack mount. Two other newly designed equalizers are also available.

Circle 47 on Reader Service Card

rated output. The amplifier's power bandwidth extends from 10 Hz to 40 kHz. The net weight is 31 lbs. Testing of these units indicates that almost any signal source may be connected to the inputs or any load to its output stage without damaging the unit. Since the amplifier uses no VI limiter, no distortion results from driving highly reactive loads. Although designed primarily for live keyboards and sound reinforcement applications, the Model 700 is claimed to be clean and quiet enough for the studio. Hum and noise are rated at 104 dB below rated output, and the unit operates at rated loads without the need for noise-producing fans.

Circle 48 on Reader Service Card

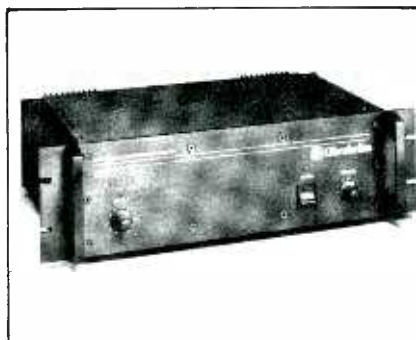
FOSTEX MULTITRACKER



Fostex Corporation's X-15 Multi-tracker is a four-track cassette recorder with built-in mixer that can record up to two tracks at a time with individual tone and level controls; the 4 x 2 mixer is used for monitoring during recording and for setting pan and gain controls for each track during remix. The transport features soft touch controls, and the tape format is compatible with the standard compact cassette. The popular Dolby B noise reduction system is integral. Battery operation is standard; AC adapter and remote punch in/punch out controls are optional. The X-15 retails for 495.00. This is not a misprint.

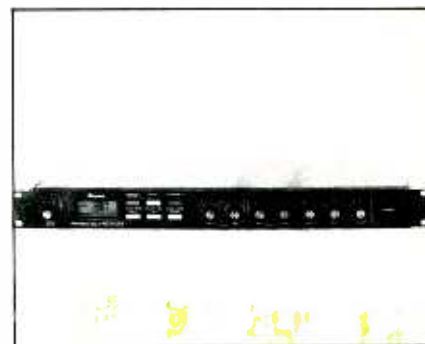
Circle 46 on Reader Service Card

STEREO POWER AMPLIFIER



Oberheim Electronics' Model 700 Stereo Power Amplifier is a new addition to their line of professional electronic musical instruments and peripherals. It is suited for the demanding role of live keyboard and P.A. sound reinforcement. While rated at 200 watts RMS per channel into 8 ohms, and 350 watts RMS per channel into 4 ohms, the Model 700 can provide musical peaks of 250 and 440 watts respectively. THD is rated at .1 percent at 20 Hz to 20 kHz at full

IBANEZ HARMONICS/DELAY



The Ibanez HD1000 Harmonics/Delay features a studio-quality harmonics section and a full-function digital delay line occupying a single rack-high space. The harmonics section provides up to 13 semitones (one octave and one semitone) of pitch shift up and down. Melodic harmony, octave shifting, micro-shift doubling, and shimmering pitch shift effects are attainable with the HD1000. The delay section provides up to 126 milliseconds of full bandwidth delay and up to 504 milliseconds at reduced bandwidth. Flanging, chorus, doubling, hard reverb, slapback, and long echo are all possible. The HD1000 also incorporates a push-button mode, delay select, and integral shift/delay/level display.

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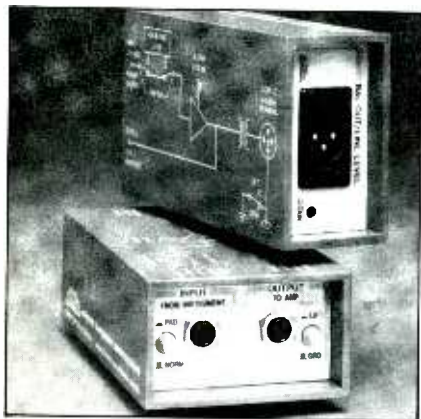
METONE METRONOME



The Metone model 23 electronic metronome provides extreme accuracy, reliability, and compact size. It is battery-operated and features solid state circuitry possessing accuracy at tempo settings from 40 to 220 beats-per-minute. Tempos are monitored audibly with the built-in speaker. The unit is small enough to fit into most instrument cases. Each metronome is packaged with a 9-volt battery and retains full accuracy throughout battery life. The model 23 offers a one year warranty.

Circle 50 on Reader Service Card

AXE'S DIRECT BOX WITH ADJUSTABLE GAIN

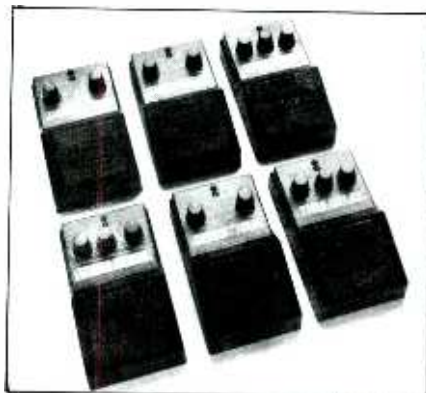


AXE's DI-100 Direct Box incorporates both active and passive devices and has several unique features. It utilizes a low-noise BI-FET buffering amp at the instrument input jack to eliminate the effects of loading, and provides a low impedance signal to the instrument amplifier, allowing long cable runs. The XLR output

is a balanced, transformed output driven from the buffer preamp stage and utilizes a special line level output transformer made by Jensen Transformer Co. Another key feature of the DI-100 is its adjustable gain. This allows the musician to optimize the instrument's level to the console for maximum signal-to-noise ratio. Unlike many direct boxes on the market, the DI-100 sends a low impedance, line level (+4 dBm) signal down the line—eliminating the necessity of using the mic preamp in the console. This results in a clean, low noise signal. The DI-100 can be powered either by its internal battery or by phantom power from the console. The unit is completely EMI/RFI shielded, and can send a +18 dBV signal to the console on 48V phantom power. The instrument input jack will accept a +24 dBm signal (with pad) or the output from a 150-watt amplifier (with pad). The DI-100 is housed in a rugged 1/2-inch thick aluminum chassis with a baked vinyl splatter finish.

Circle 51 on Reader Service Card

MXR'S NEW EFFECTS PEDALS



MXR's new Series 2000 line of effects pedals includes six new effects: Distortion+, Dyna Comp, Phaser, Stereo Flanger, Stereo Chorus, and Time Delay. Common features include long-lived battery operation, built-in voltage regulation for operation with an external AC adapter, in/out indicating LEDs, dual outputs, FET switching for silent operation, and a unique multiple function interface connector that provides capabilities such as remote switching, remote status indication, and selection of the highest voltage power source available (when used

with an AC adapter). All of the units are housed in a rugged die casting with scratch-resistant finish, and are warranted for one year.

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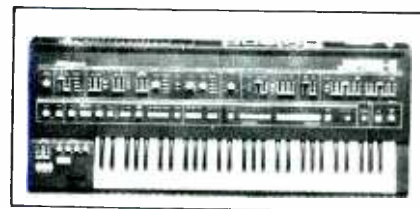
BANANA GUITAR TUNER



The new Banana BT-2 Guitar Tuner features a built-in microphone, lighted meter, and input/output jacks. The tuner can be used in-line during performance without the performer having to plug and unplug on stage. A pitch calibration screw on the bottom of the tuner allows the user to adjust pitch from A438 to A442. According to Banana, this is the lowest priced unit on the market, listing for \$29.95.

Circle 53 on Reader Service Card

ROLAND SIX-VOICE SYNTHESIZER



Roland's new Jupiter-6 is a six-voice (12 VCO) version of Roland's Jupiter-8 programmable polyphonic synthesizer, featuring a split keyboard and many new performance

features. The 61-key JP-6 can store 32 different patch preset combinations and up to 48 different patch sounds, all controlled by a remote footswitch in addition to the usual panel switches. Other unique features include a four-direction Arpeggio, a Detune key, digital LFO, ADSR, Portamento, Cross Mod, VCO1 & 2 Syncing in either direction, and Key Follow. Three modes of keyboard split let the Jupiter-6 react in conjunction with the Arpeggiator to perform a number of different effects. A cassette interface allows the player to record program data on a regular cassette tape. The data is transmitted at around 3200 bauds, so an entire program can be completely recorded in approximately 15 seconds. The Detune key allows up to 6 different module VCO pitches to be detuned. This produces an impressive ensemble effect. The Jupiter-6 also features MIDI digital interface for connection to many other computer-controlled products. The Jupiter-6 measures 41.9-in. wide by 4.7-in. high by 17.1-in. deep, weighs 35.2 lbs., and retails for \$2995.00.

Circle 54 on Reader Service Card

MARSHALL EXTENSION SPEAKER CABINETS



The 1933 1 x 12 and the 1936 2 x 12 closed back speaker cabinets are new additions to the Marshall tube combo

line. The sound configuration offers a unique closed back/open back Marshall sound that is popular among many artists. The 1933 1 x 12 cabinet lists for \$249.95 and the 1936 2 x 12 cabinet lists for \$499.95.

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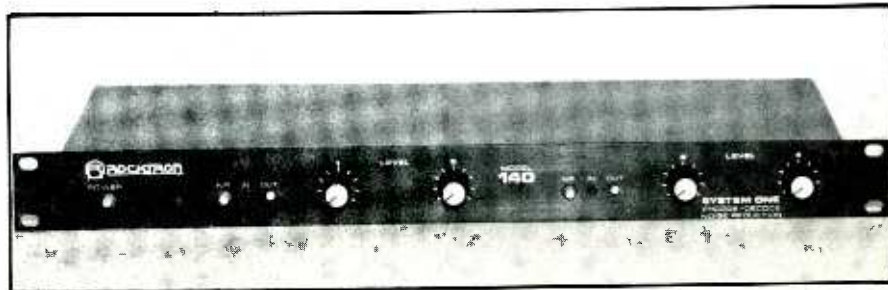
PAIA CHORD COMPUTER



PAIA'S Chord Computer helps musicians to better understand music and keyboards by cramming the equivalent of pages and pages of music theory into a compact, calculator-style package. Selecting a chord letter instructs the Chord Computer's LCD 31-key piano keyboard to display which notes to play for the selected chord; pressing another button allows for sharp, flat, major, minor, augmented, diminished, sixth, seventh, or ninth chords—including inversions. The Chord Computer can also display complete scales for all keys, or even transpose them at the touch of a button. The palm-sized Chord Computer runs off a single 9-volt battery (not included) and is available assembled and tested for \$59.95 (plus 2.50 postage & handling).

Circle 56 on Reader Service Card

ROCKTRON NOISE REDUCTION SYSTEM



Rocktron Corporation's System One encode/decode noise reduction is an advanced system in an unbalanced format. Available in two, four, or eight channels, it is designed to be used with high speed recording equipment (15 ips, 30 ips) that is capable of providing flat frequency response (± 1 dB from 30 Hz to 20 kHz). System One's innovative design takes advantage of today's improved magnetic tape. It effectively doubles dynamic range by compressing the dynamic range onto the tape during the recording process and expanding it upon playback. This allows the user to record the full dynamic range of the source. The System One greatly improves recording capabilities while decreasing distortion caused by tape saturation and eliminating tape hiss. It provides effective tape noise reduction greater than 40 dB, and is claimed to be the first companding noise reduction system to eliminate the obtrusive side effects of modulation noise (breathing), and pumping. System One's design, using high quality components and tightly matched encode/decode response, provides a transparent system without coloration. In addition, System One operates over the entire audio range offering effective noise reduction at all frequencies, requires no level matching between encode and decode (which allows easy set-up and operation), is fully simultaneous (no switching) and capable of off-tape monitoring of separate channels, and is warranted for three years on parts and labor. The Model 120 (2 channels) retails for \$319.00, the Model 140 (4 channels) retails for \$469.00, and the Model 180 (8 channels) retails for \$829.00.

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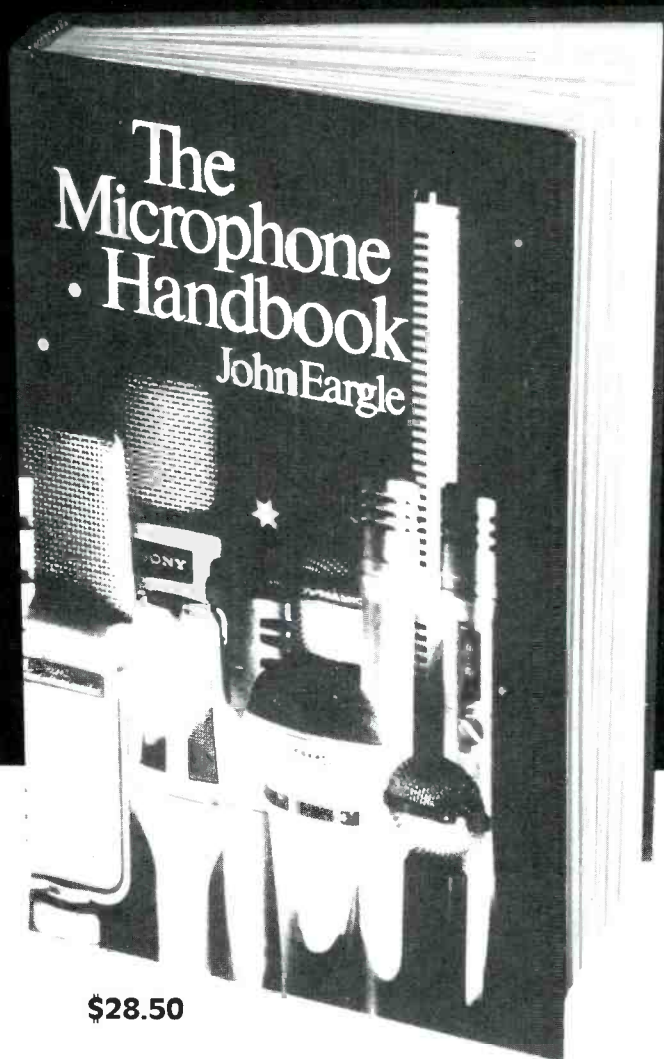


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JOHN EARGLE,

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Ambient Sound

by len feldman

A Really Big Show!

For the last couple of years, the Consumer Electronic Show, held semi-annually in Chicago and Las Vegas, has tended to de-emphasize audio electronics in favor of such diverse home entertainment electronic products as video games, video components, calculators, electronic watches and, of course, home computers and software. While in earlier years audio was the star of the show, both in terms of innovative products and percentage of floor space occupied, the 1981 and 1982 editions of CES saw audio relegated to supporting role status.

At the most recently held Summer CES in Chicago, there were definite signs of a resurgence of interest in audio and audio related products and technology. To be sure, many of the new audio developments were related to other electronic disciplines, such as video or computers, but there were enough items of interest to keep audio oriented attendees such as myself hopping from one show location to another. This year's show, incidentally, occupied four separate exhibit areas covering approximately 875,000 square feet. There were over 75,000 products on display and attendance topped the 80,000 figure by the time the show closed after a four-day run.

As everyone expected, just about every manufacturer of audio products showed at least one model of a CD player; in many cases more than one. Sony Corporation (who introduced the very first CD player available in the U.S. nearly a half year ago) was not

an official participant in the CES, but nevertheless made its presence known by privately showing a second generation CD player, their CDP-701. Instead of offering a lower-priced model (the earlier CDP-101 carries a suggested retail price of \$900.00), Sony went in the reverse direction with a more sophisticated programming capability on the newer player and an appropriately higher price of around \$1500.00.

Of perhaps greater interest to readers of *MR&M*, however, was Sony's introduction of a second-generation digital audio processor, the model PCM-701. Unlike its predecessor (the model PCM-101, reviewed in the May, 1983, *MR&M*), this one has no microphone inputs and cannot operate on battery power. Multi-mic recordists would not have been likely to use the single pair of mic inputs found on the earlier model anyway, preferring instead to use an appropriate low-noise mic mixer which would apply a line-level signal to the PCM processor. As for the omission of DC (battery) portable operation, that's a small sacrifice to make in return for a price tag that is little more than half the price of the earlier model. (The PCM-701 processor has a suggested list price of only \$1100.00.) That means that with the PCM-701 and just about any VCR, you can "go digital"—at least at the mastering level—for well under \$2000.00. (Sony, of course, prefers that you use a Beta format machine, but take my word for it, the PCM-701 digital processor works just as well with a VHS type of recorder.)

VHS Plays Catch-up

Just when the Beta camp was sure that they had a chance to recapture a bigger share of the VCR market with their Beta HiFi audio recording technique, along came JVC (inventors of the VHS video recording format) to the CES offering private demonstrations of what will probably come to be known as VHS HiFi. The specifications claimed for their version of improved audio-for-video read very much like those already available with the Beta format. Specifically, the VHS HiFi audio recording technique employs a pair of extra RF carriers which are frequency modulated with left and right channel audio information. This technique, coupled with audio companding, results in a dynamic range capability of better than 80 dB, a harmonic distortion level of below 0.3 percent and, most important of all, a wow-and-flutter reading of as little as 0.005 percent. Unlike Sony, who have not been willing to disclose just what kind of companding they are using with their Beta HiFi system, JVC told us (after a bit of prodding) that essentially they want to use a dbx type of linear companding in their VHS HiFi system. Another major difference between the Beta HiFi technique and the proposed VHS HiFi system is the use of an extra pair of recording heads by the latter system. Added to the four video heads commonly found on the fast-spinning drums of VCRs, there would be a total of six heads around the perimeter of the drum, if the system gains acceptance. I watched several demonstrations of VHS HiFi and was unable to detect any degradation of picture quality as a result of the addition of these two new audio carriers to the composite signal applied to the standard VHS half-inch video cassette.

Try as I might, I was unable to ascertain whether JVC's version of VHS HiFi was identical to that demonstrated by Matsushita Electric Company and now being made available in Japan. "Compatible" was the word that came up again and again, but that implied that there were some basic differences between the JVC approach and that of the other major VHS producer. If, indeed, these differences are significant and if each company insists on employing its own version of VHS HiFi, it may be a long time before a high-fidelity stereo recording system becomes available on VHS VCRs. In that case, Sony and other producers of Beta HiFi machines could well be the beneficiaries of the delay. Toshiba, for example, already has a Beta HiFi VCR on the market, and other Beta licensees, such as Marantz, Zenith and Sanyo are sure to follow. If the industry and the FCC move as rapidly as is now expected, the beginnings of stereo TV broadcasting could further increase the demand for better VCR audio recording capabilities.

PCM On Compact Cassettes Still Far Off

I approached CES fairly certain that I would see some efforts at standardization of PCM recording on compact cassettes. After all, it has been nearly two years now since the first attempts at digital audio on standard compact cassettes had been demonstrated. In the interim, we have seen de facto standards emerge for compact (digital) discs as well as for PCM processing of audio signals for recording onto VCRs. However, in the case of PCM recording on cassettes, the industry seemed no closer to agreement on standards than they

were last year. Number of tracks to be used across the width of the cassette tape, sampling rate, and even bit rate are still very much up in the air, with prototypes from different manufacturers all going in different directions.

In the absence of any movement towards PCM Compact Cassette recording standards, it was no surprise to find that manufacturers of analog cassette decks were still trying to squeeze every last bit of performance out of these products that they possibly could. Rather than emphasizing convenience features such as random access, programming of selections to be played, unattended recording, etc., the emphasis was definitely on improved basic performance. We saw such improvements in transport mechanisms, better means of azimuth adjustment, greater use of dbx companding and increased use of Dolby HX professional headroom extension circuitry. Bi-directional recording capabilities also seem to be on the rise, ostensibly to enable the dubbing of the new compact discs (which can run as long as 60 minutes or more) without having to turn a C-90 cassette around, thereby missing a few seconds of the music.

Among the companies offering automatic, bi-directional recording are Akai, JVC, Onkyo, Pioneer, Sansui, Sherwood, Sony, Teac, and Yamaha. The latter company's deck offers a smooth transition from one cassette side to the other by automatically fading down record level and then restoring normal level once the reversal has been completed. In most of the models shown, the reversing process is completed in two seconds or less.

Aiwa, Harman-Kardon and Bang & Olufsen are all promoting Dolby HX professional in their newest models. Coupled to Dolby C, models offered by these companies claim signal-to-noise ratios of 80 dB above 5 kHz, using metal tape; pretty incredible when you consider the fact that some of the best reel-to-reel machines not equipped with NR but operating at eight times the linear tape speed of the lowly cassette deck can't do as well.

As for dbx, it too is gaining in popularity as a noise-reduction/dynamic range expansion system. Technics, the strongest proponent of dbx, has incorporated the dbx system into five of its newest deck models, priced from \$180.00 to \$540.00. All but the lowest priced of these also incorporate Dolby C and two offer decoding for dbx discs. Teac introduced three dbx-equipped models in a line of six decks ranging in price from \$200.00 to \$650.00. Sansui has also joined the ranks of those supporting dbx. Of two bi-directional recording, three-headed machines, one comes with dbx, while both feature Dolby C.

Dual-transport units capable of 3¾ ips cassette dubbing have become increasingly popular of late, too. At the SCES, Fisher, JVC and Pioneer joined such companies as Aiwa, Hitachi, Onkyo, Sansui, Sanyo, Sharp and Technics who earlier had featured this type of deck.

While the major audio attraction at this CES was certainly the CD player and compact discs, I detected a sense of excitement and optimism in the ranks of audio manufacturers which went far beyond the introduction of the CD players to the U.S. market. There seemed to be universal agreement that earlier reports of the demise of audio were greatly exaggerated.

Lab Report

by len feldman

Denon DN-3000F Professional Compact Disc Player

General Description: The compact disc has arrived, and with it more than a dozen compact disc players from as many manufacturers. Thus far, all of these players have been designed for consumer use—with one exception: Denon's remarkable new DN-3000F, designed specifically for broadcast and recording studio work. While consumer CD players often provide random-access features and programability, time of access is often too long for the split-second timing often required in broadcast and recording studio applications.

Ideally, such functions as slip-cueing, level metering, fade up, internal monitoring, balanced line output—plus protection features which insure against inadvertent line feeds when they are not desired—should be incorporated in a pro player. In other words, it should have the same access and cueing capabilities as a pro reel-to-reel deck. Denon's DN-3000F is just such a unit, and, in fact, it incorporates several additional features which arise from the CD disc format itself and which will be much appreciated by the studio engineer who, sooner or later, will have to start using compact discs for background music in more complex productions, for mix-downs and for dubbing.

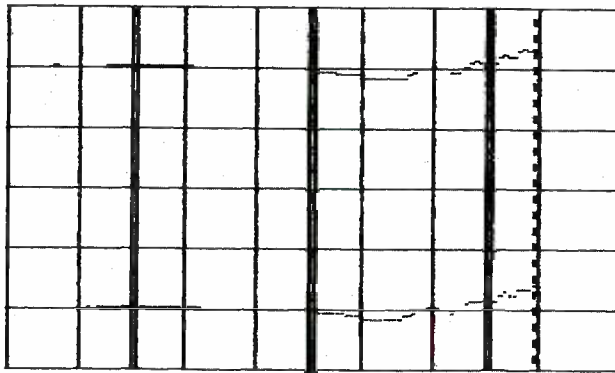
The DN-3000F is supplied as a stand-alone console, with controls and disc compartment conveniently located at desk-height. Discs are inserted into the player near its rear, via a top-loading mechanism whose door pops open when an eject button is depressed on the console.

Controls and Switches: On a sloped section of the console, RUNNING ADDRESS and TIME DISPLAY LEDs are located near a pair of standard VU meters. Track number of the disc, index number (if encoded on a given disc to divide longer selections into smaller sections) and time, in minutes, seconds, and frames, are all displayed here. Three different time displays can be accessed, using a TIME MODE button nearby. These are elapsed time of the track being played, amount of time remaining on the track being played,



or absolute time from the beginning of the disc to the current position of the laser pickup. A second display, known as the ORDER ADDRESS DISPLAY, is used in conjunction with a ten-key pad to provide elaborate random-access capabilities, including almost instant location of a given point on a disc, down to the very

FR



2dB/D L+ 0.7dB R+ 0.8dB 18.5kHz

Fig. 1: Playback frequency response.

second and frame. After punching in the desired track number, minute, second and frame, touching the LOCATE button brings the pickup to the desired location. Touching the PLAY button then starts disc play, providing that the LINE OUT lever is in its on position.

Two more touch buttons near the numeric key-pads are labeled SLOW-FAST and TOC. The Slow-Fast button is used in conjunction with a rotating SEARCH dial, which is very much analogous to slip-cueing on a conventional turntable. The search dial, which works like a cueing dial on a video console, allows you to move the pickup in frame-by-frame increments, quickly or slowly (depending upon which end of the Slow-Fast switch is touched). The pickup plays a single frame over and over again, allowing the operator to zero in on the precise cue location desired. The last button in this area of the panel is the TOC (Table of Contents) button which, when pressed several times in succession, causes the ORDER ADDRESS display to show first and last track numbers, total elapsed time and starting time for each track.

Close to the front of the console desk, and handy to the operator's fingers, are a master output attenuator

control, PLAY and PAUSE buttons, a MONITOR on-off switch (which lights up in its on position), a separate level attenuator for the built-in small monitor speaker (which plays an L + R sum program) and a button labeled ATTENUATOR START. This last-named push-button enables the operator to introduce start delays of from 0.1 to 0.3 seconds, or no delay at all. The operation of this function is somewhat similar to that found on professional turntables. The amount of delay, as well as the length of play for the slip-cue function (using the Search mode described earlier), is an internal adjustment normally performed once, during installation of the console player. STANDBY and LINE OUT lights above the VU meters tell the operator the status of the line output signal. A CUE light at the upper right of the console's sloped surface lights when an external remote control is used with the player. Protection against possible operator error is built-in to the unit. For example, when the Line Out key is on, the Eject, Locate, and Search controls have no effect if they are depressed or rotated.

XLR 3-pin connectors are located at the rear of the pedestal or stand that supports the player console. These are the balanced line outputs (separate Left and Right) and a Mix Input, which can be a signal from other equipment that can then be mixed with the Disc signals and fed to the Line Output.

Test Results: In terms of laboratory-measured results, the DN-3000F player performed no better than a consumer-type CD player. But less you misunderstand that statement, that's plenty good enough—as a quick glance at our table of VITAL STATISTICS will reveal. Frequency response, plotted for each channel in *Figure 1*, was flat out to 20 kHz, exhibiting a very small rise of 0.7 dB for the left channel and 0.8 dB for the right channel before dropping off sharply above 20 kHz. These and all of the other static measurements were made using special test discs prepared and pressed by Philips and Sony, the co-sponsors of the CD system.

Harmonic distortion at maximum recording level (0 dB in terms of the digital recording, +4 dBm on the output meters of the unit) was 0.004 percent at 1 kHz, rising to around 0.018 percent at the treble end of the

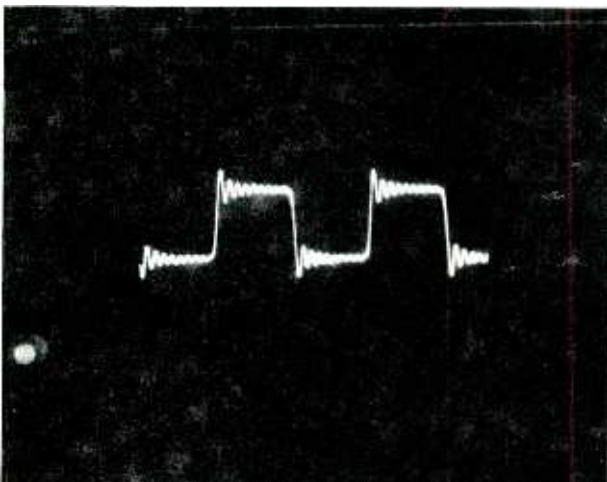


Fig. 2: Reproduction of a 1 kHz square wave.

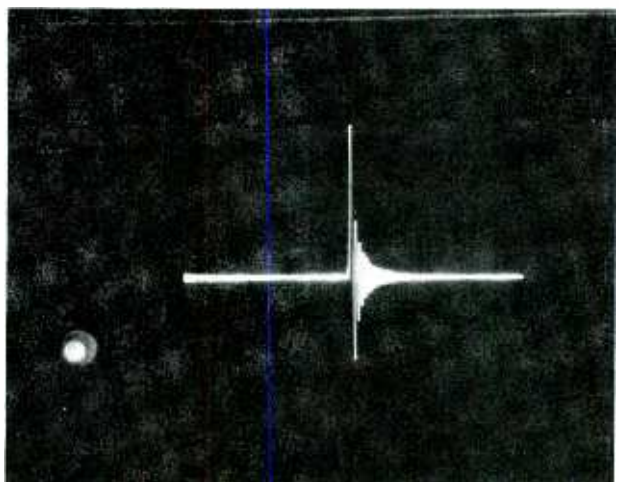


Fig. 3: Reproduction of a single-sample "pulse."

spectrum and 0.006 percent at bass frequencies. As is true of all digital disc players, distortion rises at lower levels. At -24 dB, it measured 0.04 percent at mid-frequencies and around 0.06 percent at the ends of the spectrum. Linearity was accurate to within 0.5 dB from 0 dB down to below -80 dB, while unweighted signal-to-noise ratio (band limited to 20 kHz) was 93 dB below maximum output levels. SMPTE-IM distortion measured a low 0.01 percent at maximum output, increasing to 0.08 percent relative to a -20 dB IM test signal.

Our special test disc also contains signals that test a player's ability to handle transients. *Figure 2* illustrates how the player reproduces a 1 kHz square wave. As you might expect, the sharp cutoff filters required to attenuate all signals above 20 kHz in a CD player result in phase shifts which account for the ringing observed along the top and bottom edges of the reproduced square wave. It should be pointed out that these test signals, as well as those of *Figures 3* and *4*, are digitally created and are therefore "perfect" as seen by the laser pickup. Distortions, ringing, or phase errors are all a function of the player under test and not the test disc.

Figure 3 shows how the Denon player reproduced a unit-pulse signal. This signal is made up of a single digital word at full amplitude, followed by 127 words of zero amplitude. Again, the overshoot and ringing is the result of the player's low-pass filters. Finally, in *Figure 4* we see two superimposed outputs (from the left and right channels), using a dual-trace 'scope. The two tones are 2 kHz and 20 kHz. If no phase shift is present, the positive crossing of the zero axis by the lower 2 kHz test signal should correspond to the moment when the higher-frequency signal crosses the zero axis in a positive-going direction. In fact, the time delay introduced by the low-pass filters amounts to about one-half cycle of the 20 kHz signal, which works out to a time delay of around 25 microseconds.

A second test disc, supplied by Philips, contains simulations of defects that are likely to exist on discs, and is used to measure the error-correction capabilities of a given player. The "defects" consist of a wedge, which widens from track to track of the musical selections contained beneath it, a series of opaque black dots of increasing diameter, and, near the outer rim of the test disc, a semi-opaque "smudge." The wedge is meant to represent a severe scratch on the surface of a disc. The dots are intended to simulate dust specs (of varying size), while the smudge is meant to approximate a fingerprint on the surface of a disc.

The Denon DN-3000F was able to ignore the wedge until its width increased to 600 microns. This is not particularly outstanding, since we have tested consumer type players that can successfully play through that wedge at its widest point of 900 microns. The player did much better with the simulated dust "dots," coasting right through the largest of them without so much as a millisecond's worth of sound muting or mis-tracking. It wasn't at all bothered by the fingerprint simulation either. What this suggests is that professional users of this type of player should exercise the same care with respect to the surfaces of compact discs as they do (or should) with conventional LP discs. They should be handled by their outer edges, and care should be taken not to allow their surfaces to become scratched. Given such care, the life of a

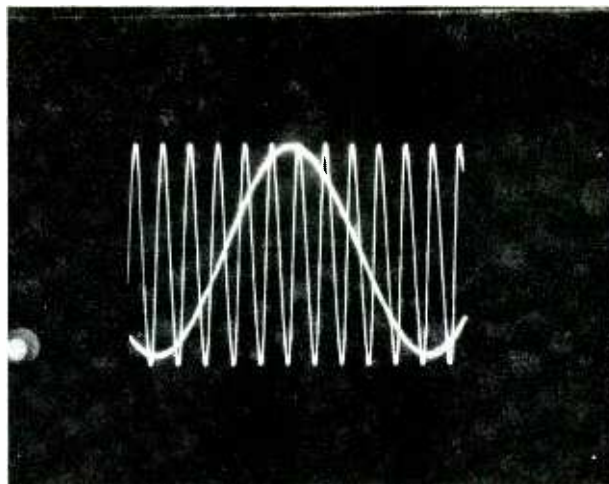


Fig. 4: 'Scope photo depicts high frequency phase delay introduced by the Denon CD player.

compact disc will be as long as its promoters are claiming for it. Without such care, discs can mis-track just as surely as poorly treated LP records can.

Comments: If you haven't heard any compact discs yet, no amount of enthusiasm on my part can convey how much better they sound than even the most carefully recorded and pressed conventional records. I am fully aware of the criticisms that are being hurled against compact discs, but I feel that most of that criticism is misplaced. With the masking effect of surface noise gone—and with a storage medium that reproduces every nuance of a musical performance faithfully—poor microphone placement, poor mixing, improper equalization at the mixing board, and bad balance between tracks in a multi-track recording all stand out much more prominently than they do in an LP pressing. Frankly, the few good compact discs that I own (and of the 50 or so now in my collection, I'd say only about 15 or so are really superb recordings) sound good on just about *any* CD player. The phase errors that critics of compact discs are talking about are so subtle, if audible at all to most listeners, that I can't get terribly excited about them.

What makes the Denon DN-3000F unique and worth devoting this space to is its superb solutions to problems that will face the professional recording engineer when he or she begins to use compact discs in the course of normal broadcasting and mixing activities. The very unit we tested, incidentally, was shipped from our lab to FM radio station WNCN, where it is now serving as that station's CD player, replacing an earlier consumer-oriented player also made by Denon. In my own auditioning of the DN-3000F I was especially delighted by one feature of the unit that wasn't even described in the preliminary owner's manual. When you insert a disc into the player's turntable area and close the door, the disc is automatically scanned so that track count, time counts, etc., can all be stored in its computer memory. So far, that's not unlike some consumer players I've worked with. But the DN-3000F, instead of coming to rest at the 00'00" starting point of the first track, actually cues up to the instant of start of music. Thus, if the music on track 1 starts one second and three frames past the actual start of track 1, that's where the laser

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pickup will focus. Then, when you shift the line-out lever to on, music starts instantly—with absolutely no waiting. That, and the other remarkable cueing and random-access features of this player, makes it worthy of the designation “professional”—a term that Denon never uses lightly.

Another important aspect of the player’s performance that is difficult to measure in qualitative terms is its ability to withstand physical shock and vibration. Unlike some consumer CD players which we’ve tested that mis-track even if their cabinets are tapped lightly with a fingertip, the Denon DN-3000F continued to track flawlessly even when we pounded our fist on the console’s surface, right near the turntable itself. Such refined and stable tracking capabilities must involve

mechanics and servo-mechanisms that are far costlier than those used in consumer CD players. The special random access and display features also add to the final cost of the unit, as do the real VU meters (not found on any home players), balanced line outputs and all the other features that distinguish this player from consumer versions. Clearly, radio station WNCN, located in New York, must have thought that the difference in features and performance was worth the extra \$7500.00 or so, or they wouldn’t have traded their consumer player for this expensive model. Whether you need such a player in your professional audio work is something only you (or your financial controller) will be able to decide.

DENON DN-3000F PROFESSIONAL COMPACT DISC PLAYER: Vital Statistics

SPECIFICATIONS	MANUFACTURER’S CLAIM	LAB MEASUREMENT
Frequency Response	20 Hz to 20 kHz ± 0.5 dB	Confirmed (See Fig. 1)
Dynamic Range	More than 90 dB	93 dB, unweighted
Distortion	0.007% at 1 kHz	0.004%
Crosstalk	90 dB at 1 kHz	See text
Output Level	+ 4 dBm or -20 dBm balanced	Confirmed
Access Time		
Track number	2 seconds	Confirmed
Index Specification	4 seconds	3.5 seconds
Dimensions	16½" w x 32" h x 22" deep	
Weight	Approximately 100 lbs	
Price: \$8500.00		

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Electro-Voice EVT 5212 Tapco Stereo Mixer



General Description: The EVT 5212 is a 12-channel, stereo mixer intended primarily for use as a mixing board in sound reinforcement applications and concerts, but it could serve equally well as a 12-in-2-out board for use in small to medium sized recording studios. This mixer incorporates a great many features normally found in much more expensive

boards, such as additional gain, excellent gain structure and even a built-in BNC connector for a plug-in high-intensity light. Among the board’s other features are color coded controls and panel graphics designed for good visibility, individual plug-in p.c. boards that can be easily serviced, and complete hook-up diagrams screened onto its rear panel.

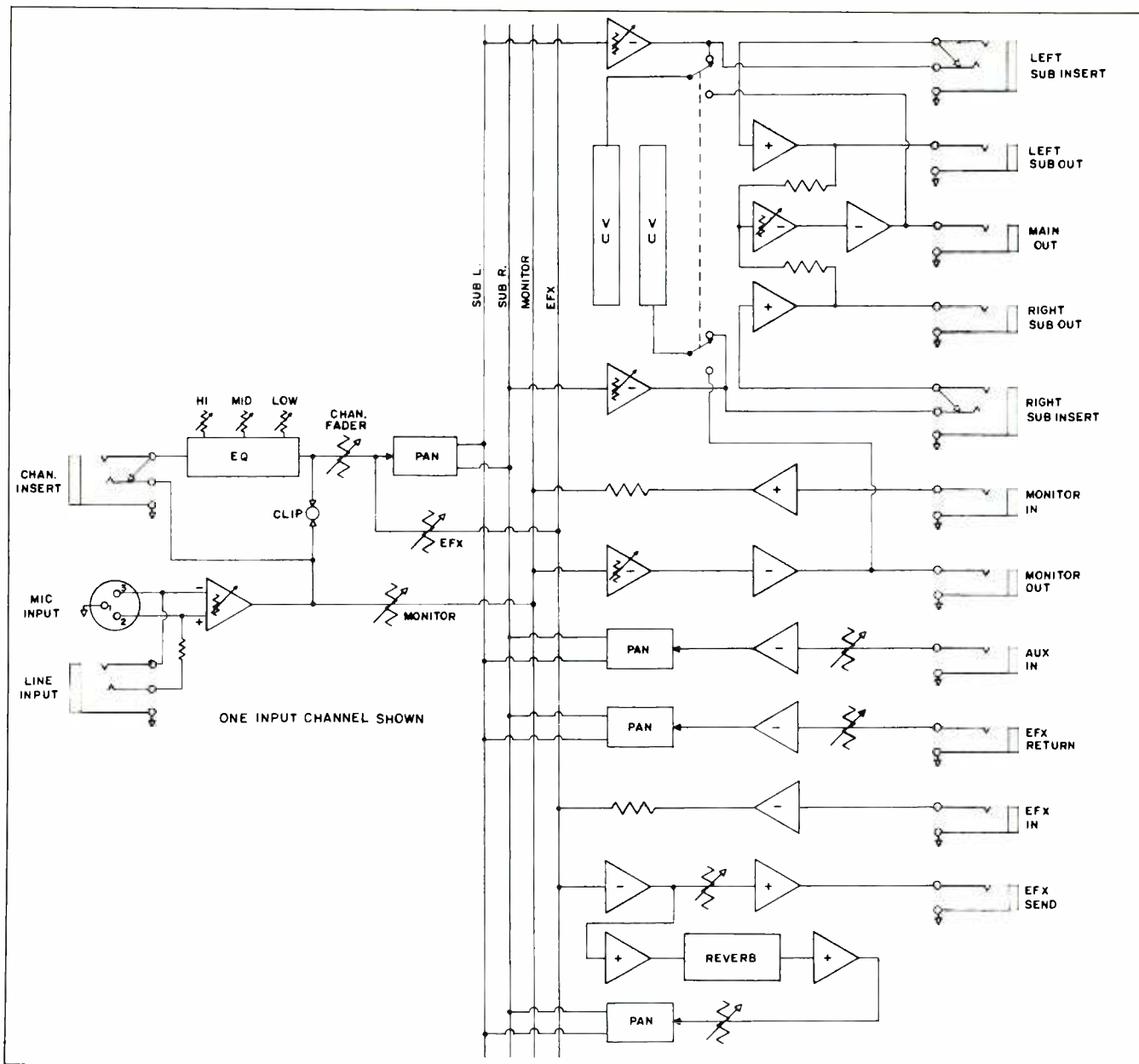
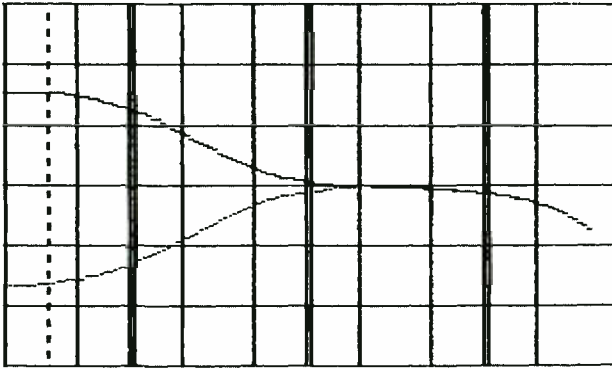


Fig. 1: Signal flow diagram.

Each of the EVT 5212's input channels accepts a balanced low-impedance microphone level or an unbalanced high-impedance line level source. There is a channel effects insert for each input, as well as for the two sub-group inputs. A three-band equalizer section (bass, midrange and treble) provides a wide range of musical equalization. Each channel also features an effects/reverb send, monitor send, pan control, peak LED and channel fader. Besides mono, stereo, and monitor outputs, the output section of the board offers the following controls: effects return master, aux input master, and reverb return master—each panable to the stereo sub-groups; effects send master, and meter assign switch.

Controls & Switches: At the very top (far end) of each channel input module is a Channel Patching Insert Jack. A 3-conductor (stereo) phone plug can be connected here for both sending to, and returning from, an external signal processing device. An input gain control comes next and it is continuously variable, providing up to 52 dB of amplification. The three continuously variable equalization controls come next. Moving towards the front of the board we come to the Effects/Reverb send control, a continuously variable knob which adjusts the level of individual input channel signals sent to the internal spring reverb and/or to the Effects Send Master. A monitor send control farther forward on the module adjusts the level

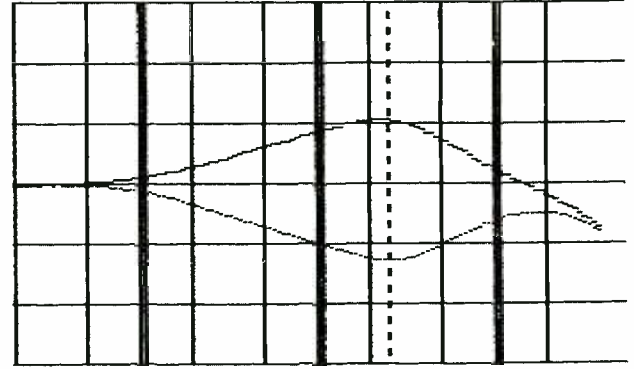
FR



10dB/D L+15.4dB R-16.0dB 35Hz

(A)

FR



10dB/D L+10.7dB R-12.6dB 2.50kHz

(B)

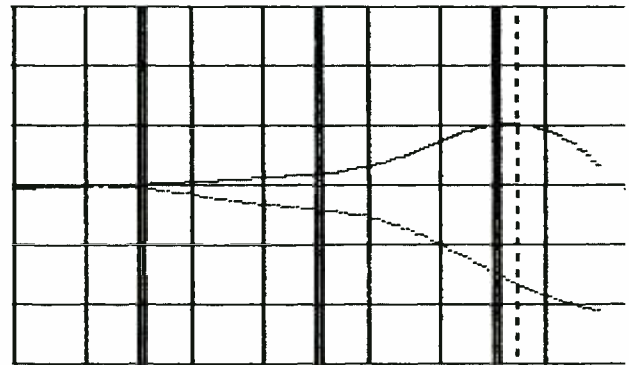
Fig. 2: Individual plots of bass (2A), midrange (2B) and treble (2C) EQ control range, with dotted-line cursor positioned in each case to frequency at which greatest boost and cut range is available.

of individual input channel signals sent to the Monitor Master. Still further forward on the module is a continuously variable Pan control. A peak LED located just above the Channel Fader Control monitors the input channel circuit for clipping or overload, both ahead of and after the equalization section. Finally, the Channel Fader controls the output level of the individual channel as it is fed to the sub-groups. Each channel module is numbered, and there is a white square at the operator's end of each module onto which notes may be inscribed with a marker pencil.

The right third of the board is dedicated to output controls, metering functions and control of special effects, as well as to the aforementioned BNC lamp connector and a power on/off switch. A pair of sub-group Insert Jacks at the top of this section provide a convenient point for adding signal processing devices to the complete left/right submaster mix. Two rows of ten LEDs each serve as output level metering systems for the Sub Left and Sub Right or Main and Monitor buses (depending upon the setting of a pushbutton switch located nearby). A zero dB indication on these LEDs corresponds to a +4 dB VU level, or 1.233 volts. Additional LEDs above that 0 dB point read to +9 dB (or, effectively +13 dB above 0.775 volts). An "EFX (Effects) Send" regulates the level sent to external effects devices such as delay, echo or flanger. The signal from such external effects devices is returned to the Sub L/R outputs via an "EFX Pan Control" also located in this area of the board. Similar pairs of controls (Input and Pan) handle levels of signals from additional external (AUX) inputs and levels from the internal spring reverb system. Master fader controls near the bottom of the board are provided for setting overall levels of the Left and Right Sub outputs, the Main output and the Monitor output of the mixer.

The rear panel of the unit is equipped with Main, Monitor, Sub R, and Sub L single-circuit phone-plug output jacks plus Monitor In, AUX In, EFX Send, EFX Return, and EFX In single-circuit phone jacks. At the rear of each of the 12 input modules are its balanced low-impedance microphone input (XLR connector) and its unbalanced, high-impedance input

FR



10dB/D L+10.4dB R-16.4dB 13.5kHz

(C)

(phone jack). A line fuseholder and a signal flow diagram screened on the rear panel complete the layout of that section of the mixer. A signal-flow diagram of the EVT 5212 is reproduced in *Figure 1*.

Test Results: Most, but not all of the performance specifications supplied by Electro-Voice in their well-organized owner's manual are tabulated in our VITAL STATISTICS chart that appears at the end of this report. Also tabulated there are our own laboratory measurements. *Figures 2A, 2B and 2C* are individual plots of the bass, midrange and treble control ranges. Sweeps are from 20 Hz to beyond 20 kHz, with double vertical lines denoting 100 Hz, 1 kHz and 10 kHz, and vertical sensitivity set for 10 dB per division. While maximum boost and cut measured for each of these controls was not precisely the symmetrical amounts specified, there was certainly enough range in each control for any practical three-band equalizing that you might want to introduce at a live music event or in a recording session. *Figure 3* was produced using a spectrum analyzer with a storage 'scope facility, and it shows a composite of the range of control of all three

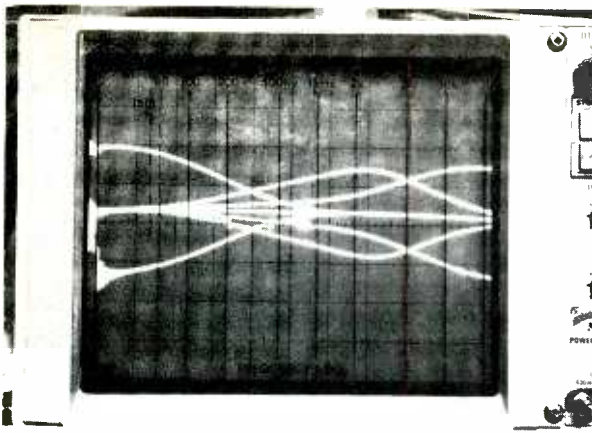


Fig. 3: Composite plot of maximum boost and cut range of all three EQ controls.

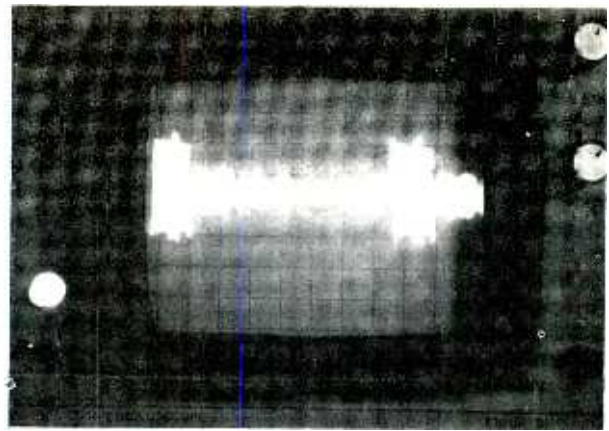


Fig. 5: When tone burst signal is fed to console input, and input and internal reverb is added, output signal appears as shown in this 'scope photo.

equalization controls superimposed upon each other through the use of six separate frequency sweeps.

Generally speaking, signal-to-noise ratios, measured for a variety of control setting combinations, equaled or exceeded published specifications and seemed more than adequate for the applications for which equipment of this kind is intended. Even with master fader and input level controls set to their nominal positions (denoted by heavier lines near the top of the fader range), worst-case S/N was never less than 74 dB, referred to 0 dB VU. That would make it 78 dB referred to the 0 dB indication on the mixer's own LED metering system, recalling that 0 dB on those LED indicators really is +4 VU. Harmonic distortion was extremely low for a board in this price category. At +4 dB levels, at any frequency, THD was well below the claimed figure of 0.05 percent and we had to crank up levels to +21.7 dB before output THD reached a level of 0.1 percent.

Figure 4 is a plot of the frequency response of four different input channels of the unit, randomly selected. While response was reasonably flat for all four of the plots shown, it was not completely identical from channel to channel. Note, for example, that high-end response for the channel represented by the lowest line in *Figure 4* tends to roll off a bit faster than it does for the channel represented by the third-from-the-top line in the display. What this means is that the center-position of the treble EQ control didn't always correspond to perfectly flat response, and if this is critical, you may want to adjust and mark the flat position of the EQ controls for each channel separately, using some sort of test frequency and metering system. We found the same thing held true for the input level controls for each channel. Because these rotary controls cover such a wide range of gain, it is not possible to rely solely on visual positioning of the knob's marker to insure equal gain settings for each channel.

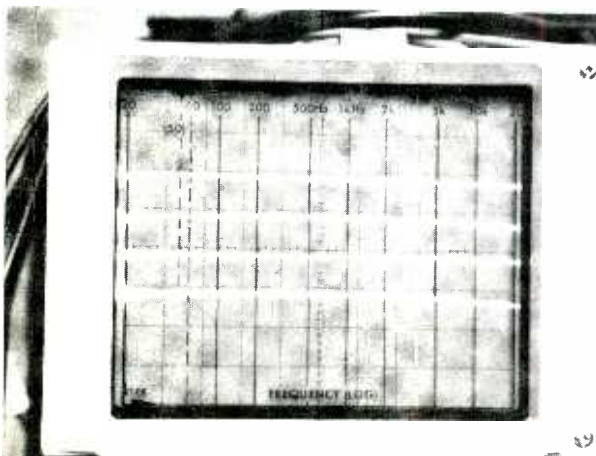


Fig. 4: With EQ controls set at mid-points, all channels offer essentially flat-response—with some "flatter than others."

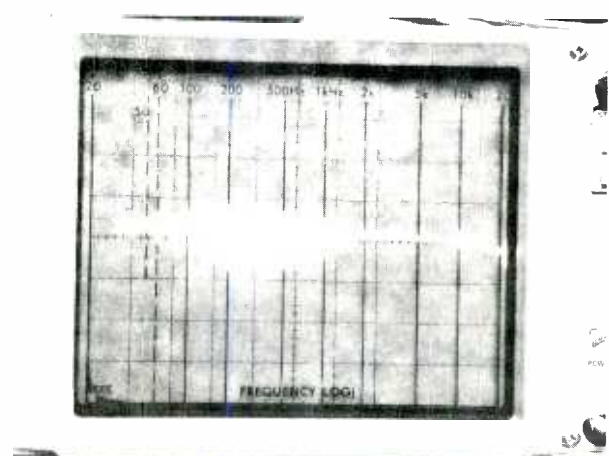


Fig. 6: With reverb turned up, "comb filter" effect shows frequency range over which spring reverb system is predominant.

Figure 5 shows what happens at the main output (or at one of the sub-outputs) when a fair amount of internal reverb is added to a tone-burst test signal. The two large bursts, at the left of the 'scope display and near the right side, are the actual input signals. All other signals seen in the display are those introduced by the action of the spring reverb system. By running another frequency response plot with the reverb system activated, we obtained the plot shown in the 'scope photo of Figure 6. Our purpose here was not simply to show the cancelling and reinforcing effects of the delayed, reverb signals (which cause a sort of comb-filter effect in the response), but to determine the range of frequencies over which the reverb feature was making its greatest contribution. As you can see from Figure 6, that range of frequencies extended from approximately 60 Hz up to around 2 kHz.

Crosstalk between adjacent channels measured an excellent -73 dB, while worst-case crosstalk at any frequency in the audio range measured an impressively high 54 dB as against the 50 dB claimed by Electro-Voice's Tapco division.

Comments: In putting this mixer through its paces on the test bench and in a simulation of an actual multi-

input recording setup, I was impressed not only by its ease of use, but by the high quality of sound reproduction which it provided. The board delivered clean, transparent sound, non-strident but crisp highs and a totally realistic low-end. Being able to insert external processing devices at will into any input channel via a simple-to-wire three-conductor phone plug is a real advantage—especially in cases where you want to limit the use of the external processing device to certain channels, rather than have it active on the total mix.

It's been a long while since I last looked at a piece of Tapco equipment; that was before Tapco became a part of the Electro-Voice family. It's obvious that the ability of Tapco's engineers to produce cost-effective products combined with the audio expertise of Electro-Voice's engineering team has resulted in a product that brings to audio professionals the best efforts of both companies. While most of us evaluate a mixer largely by analyzing its features, control layout, and input/output capabilities, I'd strongly suggest that in evaluating the EVT 5212 you do some good hard listening as well. I think you'll be pleasantly surprised at what you hear!

ELECTRO-VOICE EVT 5212 TAPCO STEREO MIXER: Vital Statistics

SPECIFICATION	MANUFACTURER'S CLAIM	LAB MEASUREMENT
Frequency Response (± 1 dB)	20 Hz to 20 kHz	10 Hz to 35 kHz
THD (20 Hz to 20 kHz, @ + 4 dB)	Less than 0.05%	0.035% (worst case)
THD (20 Hz to 20 kHz, @ + 20 dB)	Less than 0.1%	0.1% @ + 21.7 dB
SMPT-IM @ 1 dB below clipping	Less than 0.1%	0.035%
Hum and Noise (re: 0 dB output)		
Residual, main out, faders down	-90 dB	-92 dB
Main out (with controls for 44 dB gain)	-75 dB	-74 dB
Residual at "Monitor Out"	-90 dB	-94 dB
Monitor Out (with 44 dB gain)	-80 dB	-80 dB
Input Channel Equalization		
Low Frequency	± 15 dB at 100 Hz	See Fig. 2A
Mid Frequency	± 12 dB at 3 kHz	See Fig. 2B
High Frequency	± 15 dB at 10 kHz	See Fig. 2C
Microphone Input (Maximum) (1 kHz)	+ 8 dB (2.0 V)	Confirmed
Microphone Input Impedance (1 kHz)	6K ohms	Confirmed
Microphone CMRR (typical)	65 dB	65 dB
Slew Rate	15V/usec	Confirmed
Line Input Impedance	100K ohms	Confirmed
Maximum voltage Gain (± 3 dB)		
Mic In to Main Out	82 dB	80 dB
Mic In to Monitor Out	82 dB	80 dB
Mic In to Sub Out	77 dB	77 dB
Mic In to Insert Jack	52 dB	53 dB
Mic In to Efx Send	82 dB	80 dB
Line In to Main Out	49 dB	50 dB
Line In to Monitor Out	49 dB	50 dB
Line In to Sub Out	44 dB	44 dB
Line In to Insert Jack	19 dB	20 dB
Line In to Efx Send	49 dB	49 dB
Crosstalk, adjacent inputs, 1 kHz	-75 dB	-73 dB
Crosstalk, 20 Hz-20 kHz, worst case	-50 dB	-54 dB
Dimensions	26 ³ / ₈ " w x 5 ⁵ / ₈ " h x 18 ⁷ / ₈ " d	Confirmed
Net weight	30.5 lbs	Confirmed
Power Requirements	25 watts	21 watts
Suggested Price:	\$995.00	

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& MUSIC...



CLIMAX BLUES BAND: *Sample and Hold.* [John Eden and the Climax Blues Band, producers; Danny Steggall, engineer; recorded at the Sol Studio, Maidenhead, England.] Virgin/Epic FE 38631.

Performance: **Eclectic and inspired**
Recording: **Resourceful and clever**

The Climax Blues Band hasn't played anything even closely resembling the blues for several years now, replacing traditional laments with ironic comments about interpersonal and societal relationships. The best Climax Blues Band releases have combined this lyrical framework with arrangements and instrumentation that were never flashy, or "licks for licks sake," but were permeated by a good bit of creative, bubbling tension.

Sample and Hold fits this prescription well. On several tracks, the interaction between Colin Cooper's saxophone, Peter Haycock's guitar and George Glover's varied electronic keyboards is simply stunning; not for complexity, but for intricacy within simplicity. The little guitar-organ interweavings on "Listen To The Night," backed up with a Culture Club-type drum beat laid down by Henry Spinetti, are extremely tasteful, as are the multi-instrumental exchanges on "Movie Queen." This tune, the album's most polished, features a mournful, soulful saxophone solo at the end.

Fade-outs are another one of Climax' long-standing attributes, attesting to their uniformly high standards of production. Only one quibble on this whole album: a boring, overproduced, pompous aberration, "The End Of The Seven Seas," a grandiose, leaden work which lacks any of the biting directness of the other tunes on the record. It suffers from one of the few periodic Climax weaknesses: a tendency towards clichéd, lyrical allegory. When this

British band is at their most lyrically direct, such as on the organ-dominated ballad "Doin' Alright," the group is at their best.

Musically, Climax has achieved near-perfection. If they could edit their occasionally stilted analogies, all of their work would show the clever, sensuous quality they have always been capable of. RS

RENAISSANCE: *Time-Line.* [Annie Halsam, Jon Camp, Michael Dunford, producers and arrangers; John Acock, engineer; recorded at Herne Place Studios, Sunningdale, Berkshire, England.] I.R.S. SP-70033.

Performance: **Stilted and strained**
Recording: **Muddled and muddy**

When Renaissance limited their constructs to once-over-lightly borrowings from turn-of-the-century Russian masters, and gave Annie Halsam lyrics of fables and foibles to sing on top of the arrangement, the results were both predictable and compelling. Each work would be a multi-movement symphonette, with a tightly prescribed amount of time changes and mood settings colored by the well-enunciated pronouncements of Halsam.

What this album represents, however, is both the consequences of a thin, overused formula, and a misguided attempt to circumvent one's limitations. The English ensemble's only easel has been the Russian composers—yet repetition and predictability have taken the place of trademark and style. Worse yet, the band, possibly recognizing their predicament, has incorporated changes in their arrangements which, to put it mildly, do not make it. In short, the effort simply does not work.

There seems to be an attempt here to bring Renaissance into more of a

modern, "newer-music" mode. On the cover, horror of horrors, the once-courtly and ever-dainty Ms. Halsam is dressed in a rather scruffy blue-jean jacket. Inside, on the rather insufferable grooves, Annie is forced a series of electronically indulgent arrangements that force more pizzazz from her voice than she can muster. Benatar she's not; there's power in the pipes, sure, but no propulsion. She has no concept of rhythm, and, time after time, becomes metrically lost in the herky-jerky swirl of toys and gadgets going on around her. Ms. Halsam's once awesome powers of diction, a trademark of earlier LPs, becomes a series of convoluted writhings as she attempts to "belt out" song after song of nonsensical lyrics over the din. On tunes such as "Chagrin Boulevard" and "Richard The IX," the poor lady's voice is literally lost in the sauce.

Other members of Renaissance deserve grand jury indictments for putting this innocent lady through all this torture. True, snippets of Rimsky-Korsakoff remain, but, more often than not, they are delivered via electronic gimmick, not via the elegant grand piano lope of efforts past. "Electric Avenue" is an example of this; after an annoying piece of derivative "fuzak" (fusion-Muzak) noodling, the piece becomes even more muddled.

Even in those rare moments when Ms. Halsam's entreaties manage to be heard above the muck, there is scarcely any enlightenment. The one quasi-literate, somewhat-intelligible cut, "Distant Horizons," barely qualifies as sophomore high school poetry. It's similar to a bad Moody Blues outtake.

Renaissance is faced with some critical decisions. Their present personnel is, by influence and inclination, not equipped to handle the complex demands of the electronic 80s, and this attempt at fusing copped figurines from the Russian

masters with inappropriate (in this context) studio toys does not come off. They will soon have to decide whether it's better to go back to more sparsely-arranged, string-imbued fairy tales of princesses and kings. Whatever you do, Annie, please—no more blue-jean jackets. You sound *and* look silly. RS

RAMONES: *Subterranean Jungle*.

[Produced by Ritchie Cordell and Glen Kolorkin; recorded at Kingdom Sound, Syosset, NY, Ron Core, assistant engineer; originally mastered by Stew Romain at Columbia Recording Studios, New York.] Sire 23800-1.

Performance: **Uninspired, boring**

Recording: **Dense, loud**

The Ramones have been knocking around for a few years now, but if this is the best they can do with what they've learned in the business, they'd better give up. This is an abrasively loud, frequently thick-sounding recording that has little to recommend.

Anyone interested in power chords will have a fine time wallowing in the volume and repetitiveness found here; anyone who is interested in rock music (even high decibel rock music) with a little bit of finesse should look and listen elsewhere.

The faults are many, not the least of which is the material. Some of the songs are covers of much earlier material, but even these songs are rendered senseless by the onslaught of the guitars, bass and drums of the Ramones. The lyrics of the original material often are stupid, but even those that aren't are delivered in a wrong-headed way.

A case in point is "Highest Trails Above," with words that retain some sense of artistic imagery. The lyrics demand a ballad approach, but what they get instead is the same old bombast.

Some of the really off-the-wall lyrics include "Psycho Therapy," "Time Bomb" and "Everytime I Eat Vegetables, It Makes Me Think of You" (honest)!! Some of the lyrics reflect a meanness that would be appropriate to the working class hostility of English punk rockers and, in fact, the album as a whole is filled with the kind of banal sound that often is associated with punk rock.

Among the covers. "Little Bit O'



The Ramones

"Soul" suffers from a lack of affinity for the 1965 Carter/Lewis composition. It sounds thick, stubby and one dimensional, with the lead vocal resembling the chant of a lobotomized inmate. The crashing guitars and massed sound of the instrumental accompaniment cause headaches.

The unified sound achieved on this recording has the effect of blocking out any subtleties of the recording studio technician's art. "Time Has Come Today," a Joseph Chambers song from 1966, suffers from this lack of subtlety, although it is modeled on a Chambers Brothers hit from the heavy-metal era of nearly 20 years ago (complete with guitar feedback to bring the cut to a close).

Some of the material, such as "My-My Kind of Girl," with its falsetto vocal line, and "In the Park," in which the lead vocal sounds as if a serious speech impediment needs correcting, is just plain trite.

Whatever Dee Dee, Johnny and Joey Ramone were thinking of here, it makes for some pretty grim listening. *Subterranean Jungle*, perhaps intended to be a collection of street-wise, urban rock songs, succeeds only in being a collection of raw sounds, presented in a punishing fashion. SR

JIM CAPALDI: *Fierce Heart*. [Steve Winwood and Jim Capaldi, producers; recorded at Netherturkdonic Studios, England, Winwood and Nobby, engineers; Jam Recording Ltd., Dave Belotti and John Etchells, engineers; Regents Park Studios, Phil Bodger, engineer; Wessex Studios, Mark Freegard, John Wallis, Graham Watts and Keith Fernley, engineers; Matrix Studios, Tom O'Leary, engineer; mastered at the Sound Clinic by John Dent; remastered for the U.S. at Atlantic Studios by Dennis King.] Atlantic 80059-1.

Performance: **Comeback by '60s prog-rocker**

Recording: **Somewhat trendy, but never sterile**

Jim Capaldi's best work has always sprung from his innate sense of rhythm, active imagination and intense determination. His worst work, including his last LP released Stateside, 1979's quasi-disco *Electric Nights*, has resulted when the Britisher-cum-Brazilian has allowed faddism to cloud his instincts. *Fierce Heart*, Capaldi's sixth domestic solo album, is for the most part a return to his natural folk and r&b inclinations; recorded with various sidemen at five different studios, this album reunites two-thirds of the influential group Traffic—Capaldi, the drummer, lyricist and vocalist, and Steve Winwood, the multi-instrumentalist, composer and virtually peerless vocalist. *Fierce Heart* is uneven—brilliant in spots and mundane in others—but, all in all, a vindication for Capaldi and his best effort since his outstanding solo debut in 1972, *Oh! How We Danced*.

Capaldi, writer or co-writer of all nine tunes on *Fierce Heart*, uses certain in-vogue instrumental and production techniques without abusing the end product. "Tonight You're Mine," the opening cut, convinces despite some gratuitous Vocorderized effects; guest Van Morrison's acoustic guitar underlay serves as an adequate foil. Winwood's synth-pop sheen, the same gloss that pervades his two ultra-successful comeback albums, is evident in spots here, but Capaldi seems to exert an almost Svengalian influence over his partner, even though this is their first full-fledged collaboration in almost a decade. Capaldi, working in Winwood's home studio, Netherturkdonic, convinced his friend to play instruments he seems to have abandoned of late: electric guitar, organ and piano. Winwood's newfound success is deserved, to be sure, but his two most recent solo efforts pale beside his earlier work; one hopes the introverted genius will return the co-producing favor with Capaldi.

Capaldi's playing here is crisp, precise and, most of all, swinging; drum machines are employed on a few tracks but, thankfully, the somewhat artificial sound does not sterilize the over-all groove. One senses that Capaldi has never been truly satisfied with his own drum-

ming (he began his professional career as a lead singer-frontman, a position he resumed, briefly, during Traffic's *Low Spark of High Heeled Boys* period). Capaldi's loose, controlled drum patterns were overshadowed during the late '60s by Cream's Ginger Baker. But Capaldi, to these ears, however, was to Traffic what Philly Joe Jones was to Miles Davis' mid-'50s quintet—a supple stickman capable of either shimmering delicacy or volatile propulsion, depending on the situation.

As a lyricist, Capaldi portrays the streetwise rebel or the hopeless romantic, the forelorn outcast or the reckless wayfarer. His best lyrics—"Dear Mr. Fantasy," "40,000 Headmen" and "The Low Spark of High Heeled Boys" for Traffic, and "Gifts for Unknown Things" and "Back at My Place" on *Fierce Heart*—are abstract dreamscapes, sometimes wistful, sometimes frightening. His worst lyrics—"Runaway" on this album, for example—are secular throwaways. "Runaway," a trite story of teen trauma, brings to mind Steve Miller's "Take the Money and Run," a recollection worth forgetting. "Gifts of Unknown Things," on the other hand, is an atmospheric, Gothic adventure. This tune, more than any other, expresses in allegorical form Capaldi's philosophy: The pursuit of the greatest riches involves the greatest peril. "I'll Always Be Your Fool," a light and lilting number, sports nimble Brazilian percussion and Capaldi's hopeless-romantic persona; "That's Love," another soft rocker, benefits from Winwood's bubbly keyboards and a vocal chorus comprising Capaldi, Winwood and the latter's wife, Nicole. In all, the good lyrics on *Fierce Heart* outweigh the bad, just as the acoustic backing (tasteful horns, piano, guitar and percussion) tempers the occasionally thick electronic coating.

Interestingly, Capaldi overdubs his own acoustic piano over glockenspiel and other percussion on "Fool," and, in so doing, reminds one of the opening to "The Low Spark of High Heeled Boys," one of Traffic's best-remembered tunes. The syncopated, tension-and-release on the song is one of the album's high points. "The Low Spark..." perhaps coincidentally, has been redone by Capaldi on a new 12-inch; the new version, however, is not included on *Fierce Heart*.

Jim Capaldi has returned with renewed conviction and a now-

sounding record that showcases his many skills without compromising his vision. Hopefully, the brochure and career chronology that accompany the promotional copies of this record will also grace the disks distributed to record stores. Capaldi's role in Traffic, one of this reviewer's all-time-favorite groups, has never been fully understood (and thus appreciated) by the rock public, and that's too bad, because that band holds a special place in Capaldi's heart, mind and music. GK

DNA: Party Tested. [Produced by Spencer Proffer; engineered by Duane Baron; recorded and mixed at The Pasha Music House, Hollywood, CA.] Boardwalk NB-36002-1.

Performance: **Energetic**
Recording: **Dense, drums and keyboards prominent**

Two of rock music's senior citizens, Rick Derringer and Carmine Appice, join forces on this generally no-holds barred assault on the senses that scores well in some places but not so well in others.

There is little doubt that Derringer knows his way around a guitar, or that Appice has a more than passing familiarity with a drum kit. When you add Jimmy Johnson's bass and keyboards by Duane Hitchings, you get a fairly powerful quartet that aims to rattle a few windows. The licks are hot, even though the words are not.

The overall effect of this album is one of density, with precious little room for solos or solo breaks. The separation of sounds is pretty good, but some more innovation or imagination in the charts would have helped considerably. The recording of the title cut is an exception—with drumsticks heard in either channel, drums in the center and guitars seemingly between the drums and sticks for almost five points of sound.

What lifts the album somewhat above the average early 80's rock album is an understanding of how the basic rock instrument lineup can contribute to the impact of rock music tracks. "The Song That Wrote Itself," a rock-funk description of songwriting, is more interesting for its arrangement than its lyrical content. There are a lot of things

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going on here in the drums, synthesizers and guitars, and the listener is able to pick up on all of them. The lyrics are rather uninspired and the vocals frenetic, as they are on nearly all the cuts, but the gut feeling of good old rock 'n' roll is there.

If there is one main drawback to this raucous effort, it would be the gibberish that passes for lyrics throughout. "What About?" opens with the same kind of powerful percussion and synthesizer forces as other tracks, but the shouted vocal line ("What about me?/What about you?/What about us?") is a primitive and weak derivative of the opening lines of "I Am the Walrus," with none of the wit. "Intellectual Freedom for the Masses" just about says it all in the title, a real loser.

The duo did, however, reach back into Gary Glitter's songbag for a good cover of "Rock & Roll, Part II," a sizzling blend of drums, synthesizer, bass and guitars that creates quite the visceral impact.

The effect of the album is one of dense, driving rhythms—which can be the essence of rock and roll. No political messages, no ethereal ballads probing the meaning of life or love, just some gutsy, up-front playing. More variety might have been added, but for an album entitled *Party Tested*, the tracks do rather well for party music. Play this one loud and don't worry about the lack of finesse.

SR

SPANDAU BALLET: *True*. [Produced by Tony Swain, Steve Jolley & Spandau Ballet; engineered by Tony Swain, assisted by Richard Lengyel; recorded at Compass Point Studios, Nassau, Bahamas; mixed at Red Bus Studios, London.]

Performance: **Harmless**
Recording: **Homogenized**

Shoved into a pigeonhole at a time when any group with strange haircuts whose music lacked howling, blues-based guitar leads was considered "new wave," Spandau Ballet is kin to the Clash in the same way that skim milk is related to Limburger cheese. There are no sharp edges to their sound; it is relentlessly unobtrusive, ideal for fashion shows or as the soundtrack for one of those dreamy sequences in a movie where vaseline has been smeared around the edges of the camera lens. On *True*, the band's basic line-up (guitar, bass, drums, sax and vocals) is augmented by keyboardist Jess Bailey, who provides a simple, understated counterpart to songwriter Gary Kemp's even, undistorted guitar lines.

The guitar, for the most part, has a dry, clean sound with a minimum of effects; a smidgeon of reverb on the title track complements the echo applied to the vocals there. There are few places where the guitar takes a solo; indeed, solos seem out of character with Spandau Ballet, and the seamlessness of their sound is not really broken by leads. It just contains them, like an aquarium houses a school of goldfish. When the saxophone plays a lead line, its presence is softened by receded positioning in the mix and the mellow timbre associated with the LA sax sound.

The supporting roles that the drums and percussion play on *True* help shade the distinctive differences between the sides of the album. The constant tapping of the high-hat cymbal on side one, pushed out front beside the lead vocal, provides the only beat that is easy to hang on to.

Side two is rendered more danceable by an occasional popped bass string, perkier keyboard parts, a funkier approach to the guitar, and a heavier foot on the bass drum. The percussion, which could spice up any of the tracks with a more prominent position in the mix, is generally kept so far in the background that its effect is atmospheric.

Spandau Ballet has neatly constructed a sound which would be called sophisticated by some and bland by others. Without raw edges, the pop-chorded songs are not designed to shock or disrupt, but provide a non-taxing experience for the listener. SB

ANGELA BOFILL: *Too Tough*.

[Angela Bofill and Narada Michael Walden, producers; Side 1 recorded at The Automatt; Side 2 recorded at Mediasound Studios and The Automatt; David Frazier, engineer Side 1; Maureen Droney, engineer "Too Tough"; Michael Brauer and Leslie Ann Jones, engineers Side 2; Leslie Ann Jones, mixing Side 2; Michael Brauer, remix on "Is This a Dream?"] Arista AL-9616.



Angela Bofill

Performance: **Misdirected, uneven, but occasionally inspired**

Recording: **Schizophrenic**

The dichotomy of postdisco-funk has claimed many victims, and diva Angela Bofill shows herself on *Too Tough* to be especially vulnerable. Bofill has yet to fall prey to this insidious affliction—the intent in the studio is to free the dancer's feet while numbing his mind with limp strings, hokey horns, disembodied

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voices and other postproduction gimmicks—because her records still tend to be a mishmash of fatuous funk, jazz-inflected ballads and breezy, Caribbean numbers.

The singer's style defies outright categorization but, consequently, her albums are uneven. Moreover, Bofill's duality of production—Narada Michael Walden handles the first side, Bofill the second—contributes to the confusion. Then again, this seeming confusion may be a contrived attempt to foster programming on the black-funk radio stations and, at the same time, maintain the singer's stature on the jazz-pop-fusion airwaves.

Love, it is said, is a many splendored thing, and this album of love songs (Bofill's five originals occupy the second side, the one she produced) is a many styled affair. "Too Tough," the opening cut, is the sort of bombastic funk one hears spewing forth from boom-boxes on 42nd Street. This silicon chip Motown transmutation features knee-jerk/lockstep rhythms and a basso-profundo male backing vocal rendered laughable by a Vocorder. The sexuality of the lyrics ("I want you right in between/not too big, not too small, just right") is delivered rap-style; the effect, instead of being feverish, is frivolous. "Too Tough" is too slick, too rhythmically monolithic, too trite and too tiring. Commercial radio eats it up. The next tune, interestingly, is a reworking of a real Motown classic, "Ain't Nothing Like the Real Thing." By comparison with "Too Tough," "Real Thing" is just that—a spirited r&b duet between Bofill and Boz Scaggs. The side-by-side sequencing of the first two tunes, each with strong commercial appeal, illustrates how the production of soulful sounds has changed in 20 years: The natural voices on "Real Thing" are perfectly timed and propelled by a springy beat; the strings, flute and chunka-chunka guitar uplift the voices. Bofill's voice on "Too Tough," however, is run through machines and robbed of its emotional value. The instrumentation camouflages rather than enhances her singing. "Too Tough," a quickie, suffers from too much studio afterplay and too little tenderness. "Tonight I Give In," a Grammy-quality ballad, is a cathartic experience because, unlike "Too Tough," Bofill doesn't have to fake it. The strings catch her voice on the upswing and lend credence to the chorus.

Bofill is left to her own devices on the second side, and wisely, she relies on her words, her voice and mostly restrained backing. The strings and horns, especially on the lightly Brazilian "Song for a Rainy Day," are tastefully applied, allowing the singer's phrasing and intonation to shine through. The basic tracks on side two employ essentially the same instrumentation as those on side one, but the sound is streamlined, the highs and lows framing Bofill's voice.

Angela Bofill has all the tools—a genuine Latin sensibility, classical voice training, and writing skills to match her versatility in numerous musical genres. Once she realizes that she can't tighten a nut with a hammer, she'll be ready to build a career on the solid foundation she laid in the late '70s. GK



RON CARTER QUARTET: *Parfait.*

[Ron Carter, producer and arranger; Rudy Van Gelder, engineer; mastered by George Horn; recorded at Van Gelder Studio, Englewood Cliffs, NJ.] Milestone M-9107.

Performance: **Solid and swinging**
Recording: **Deep and resonant**

If record companies and the jazz public have difficulty keeping up with Ron Carter and all his changes, it is only because the bassist-composer is constantly challenging himself "to see if I can play what I write or what I hear."

Parfait, featuring Carter's two-bass quartet, was recorded before but released after *Super Strings*, an adventurous project that augmented a quartet with a 27-piece string orchestra. Carter finds that his songwriting methods work well both ways, as he told *Modern Recording & Music*, noting that he can write with either a quartet or a string-orchestra-plus-quartet in mind, and then reduce or enlarge the tunes as needed. "It just depends on how well I can adjust the size of the sound I'm supposed to hear," he remarked. "It's one thing to make a record with 26 strings and a rhythm section; it's another thing to do the same tune

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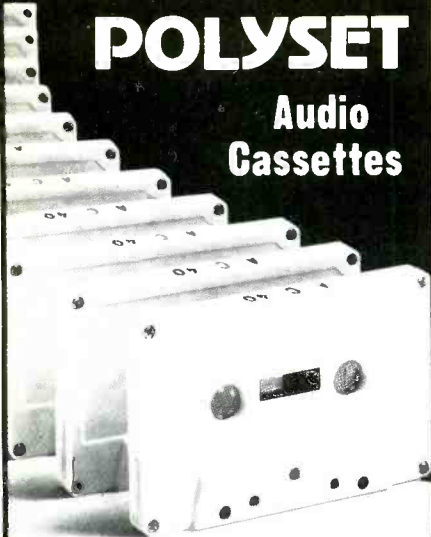
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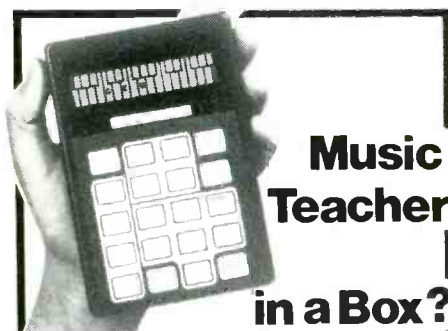
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Two Unmistakable Originals: Bob Moses and Art Farmer

by nat hentoff

A drummer and composer much respected by his peers in what might be called post-Coltrane modern jazz, Bob Moses has now emerged as the possessor of one of the grander imaginations in America's true classical music.

In *When Elephants Dream of Music* (Gramavision Records), Moses has not only written the entire album, but in the process has also created his own musical universe. These are not just clever themes, but rather a wondrous gestalt—a fusing of Moses's memories and fantasies with the variegated skills of an orchestra including such other original voices as those of Howard Johnson, Steve Swallow, and Terumasa Hino.

No orchestral composer of this scope, mellow wit, and freshly distinctive range of colors has come along since Gil Evans. And it is Evans himself who salutes this Bob Moses achievement as “a musical environment that is balanced between discipline and freedom, compositional design and spontaneous inspiration.” The melodies are bold and appealing; the harmonic vision is spacious and unhurriedly unpredictable. And most of all, it's so much fun—for listeners and the musicians.

The pieces range from gently antic musical portraits of friends to an evocation of Hawaii and a tribute to Miles Davis. But there's much more. This is the most stimulating orchestral set—subtle, sensuous, dreamlike, joyously real—in a long, long time. The engineering is fully up to the challenges of Moses's intimately lucid scoring—with everyone in ebullient balance.

While Bob Moses creates on a large canvas, as if he were a musical novelist, Art Farmer continues to prefer the short story—a microcosm that is usually composed of just him and a rhythm section. His performances are epiphanies for incisive illuminations of moods and remem-

brances that unexpectedly cast quite new shades of meaning on such songs as “Three Little Words” and Duke Ellington's “Warm Valley.”

For a long time, Art's preferred instrument has been the flugelhorn, and throughout *Warm Valley* (Concord Jazz) the gently enveloping warmth of that sound superbly complements the sometimes austere conception of the leader. The result is that the lyricism never slips into either sentimentality or mathematics. The balance between mind and spirit is just right.

Farmer's colleagues on this session are drummer Akira Tana, bassist Ray Drummond, and pianist Fred Hersch—an improviser of formidable technique and a compelling romantic bent that further adds to the emotional intensity of the performances.

The repertory is unusually diversified, starting with Charlie Parker's “Moose The Mooche,” gently entering into Benny Golson's lovely “Sad To Say,” and resurrecting Billy Strayhorn's “Upper Manhattan Medical Group.”

Farmer has been based in Vienna for many years, but recently he has been coming back to the States more often, as the renaissance of interest in jazz—all of jazz—has led to more gigs for him. This set should increase the number of those gigs. As is customary with Concord, the sound is bright, warm, full, and satisfying all the way.

BOB MOSES: *When Elephants Dream of Music*. [Bob Moses, Pat Metheny, producers; David Baker, engineer.] Gramavision GR 8203 (distributed by Polygram).

ART FARMER: *Warm Valley*. [Carl E. Jefferson, producer; Ed Trabanco, engineer.] CONCORD JAZZ CJ-212.

MODERN RECORDING & MUSIC

with a quartet. It's a matter of getting the essence of the big group out of the quartet, and vice versa."

As for recording, Carter prefers to work live in the studio, without overdubbing. (The only overdubs on *Super Strings*, according to Carter, were his own piccolo bass solos and some percussion by Ralph MacDonald; the piccolo bass solos were overdubbed because Carter played rhythm bass with the orchestra.) For *Parfait*, Carter and engineer Rudy Van Gelder, in whose studio the LP was recorded, faced an inherent predicament: how to keep a two-bass quartet, on the surface an expanded rhythm section, from sounding too bottom-heavy.

They succeed. In place of the string orchestra's upper-register coloration and texture, Ted Lo's acoustic piano and Carter's own cello-like voicings on the piccolo bass fill out the high end. The melodic imperative is handled largely by Lo and Carter, whose piccolo bass is an intriguing improvising instrument. (Tuned like an upside-down cello, the piccolo bass is three-quarters the size of an acoustic bass.) Carter harmonizes with—and against—the upright bass playing of Leon Maleson; Wilby Fletcher's drum sound is clean and crackling, supportive and never intrusive. As befits this unusual instrumentation, Van Gelder has obviously gone to great lengths to filter out any distortion and surface noise. Such imperfections would be disastrous to the resonance of this record.

The absence of strings or horns on *Parfait*, not to mention the sometimes overpowering bass sounds, may be unsettling for the uninitiated. But Carter, an acoustic chauvinist who simply has no use for electronics, plucks his strings for all they're worth, drawing forth rich overtones and ringing effects that assuage Maleson's often fat, globular bass.

Make no mistake about it, this isn't chamber jazz. *Parfait* swings when it doesn't soothe. The program, recorded in September 1980, showcases four Carter originals as well as a transcription of "Round Midnight," the title track of the Miles Davis Quintet's 1957 debut for Columbia (on which Carter played). "Parfait," which begins the album, starts things off at a finger-snapping tempo as the basses state the theme; the piano, used essentially for accompaniment here, is undermic'ed, but

that problem is corrected on subsequent numbers. The ruminative "New Waltz" follows, with a heart-beat pulse that segues logically into "Receipt, Please." Things loosen up on this rollicking tune as Lo's Latin-tinged piano combines with Carter's arpeggios to create a bouncy vamp. Side two's opener, the tender, swinging "Blues for D.P.," dedicated to the pianist Duke Pearson, enables the quartet to stretch out for 10 minutes, before "Round Midnight" draws the album to a close on a reflective note.

Parfait is a winning effort because of, not in spite of, the risks it takes. As a document of Carter's early '80s working quartet, it is a valuable chapter in the bassist's ongoing evolution. The empathy among the band members, the choice of Van Gelder as engineer (an obvious one considering his outstanding work for the Prestige and Blue Note labels), Carter's strong compositions and his dexterity on the piccolo bass contribute to a solid and worthwhile effort. But this is Ron Carter 1980, not Ron Carter 1983, and modern-minded listeners are advised to forge ahead...as Carter certainly will.

GK

MILES DAVIS: *Star People*. [Teo Macaro, producer; Lou Schlossberg, Ken Robertson, Harold Tarowski, Bill Messina, engineers; recorded at CBS Studios, New York.] Columbia EC 38657.

Performance: **Something old,
something new,
something borrowed,
something blues**

Recording: **Eccentric**

One of the early landmarks in the recording career of Miles Davis was an album entitled *Kind Of Blue*. There's a quirky qualification in that title. Not, *The Blues Trumpet of Miles Davis*; but, *Kind Of*, which implies that Davis *personalized* the blues tradition, staked out his own turf and tinkered with the traditional form.

Decades have passed since *Kind of Blue*, and the indefatigable Davis has once again returned to the blues as an inspirational wellspring. And once again he has done something strikingly idiosyncratic with the blues. He has electrified them, jazzed them, injected them full of funk and fusion.


This modern redefining of the blues on *Star People* was accomplished by an extremely cohesive band. This is the first Miles Davis release I've heard in several years where Davis did not tower about his players. Everyone is cooking and creative, young and old players alike. Every player has the blues—and knows how to energetically declare them.


A number of the compositions (all Davis originals) take traditional blues riffs as starting points. The opening cut, "Come Get It," uses an old Otis Redding bass vamp figure as a signature. "It Gets Better" steals a chord progression from Lightnin' Hopkins; the eighteen minute title cut is an anthology of classic blues licks.

Davis transforms every blues lick by varying tempos, by inserting unexpected melodic bridges, and by playing each song with his characteristic tense and terse reedy sound. Each song is rhythmically pushed by drummer Al Foster, percussionist Mino Cinelu, and bassists Marcus Miller and Tom Barney. Small tonal colors are added by sax man Bill Evans (who has

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
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remarkably little solo space throughout), while electric guitarists Mike Stern and John Scofield trade off solos which in every way match Davis for economy and inventiveness.

"Star People" is the most musically complete statement on the album and shows the band in its best light. Davis plays both trumpet and, occasionally, synthesizer. His trumpet solo work takes a while to really take off, but when he finds his direction there's no stopping him. Al Foster's drumming is funky and nasty and full of voodoo power. Stern drops his usual rock stylistics on guitar and shows his indebtedness to B. B. King. It is a moody and sweeping statement. Yet the other five pieces on the record are all noteworthy, too.

I would like to be equally flattering about the recording quality, but such an opinion would be harder for me to sustain. My chief complaint is that I don't appreciate what was done to Al Foster in the final mix, or perhaps during the recording process itself. Somebody played with the board on "Star People" and succeeded in making Foster's cymbals sound like old and badly bent hubcaps. Leonard Feather's liner notes suggest that this was an intentional act of technical genius created by either Davis or Macero or both. I think it a gross act of distortion. It is bad enough that Foster's manically brilliant drumming is too low in the mix throughout much of this recording. To reduce his sound on cymbals to something that sounds like a Revere Ware pot hit with a tinny soup spoon is criminal. I also would have appreciated Evans' horn more forcefully mixed.

But while the recorded sound is far from stellar, the music itself is. It is silly to join those choruses of critics who crow: "Miles is back." He never left. And when he does, he will only shift location, not form. The star on earth will continue to glow in jazz heaven. NW

JANE IRA BLOOM: *Mighty Lights*.

[Horst Weber and Matthias Winckelmann, producers; recorded and mixed by David Baker at Vanguard Studios, New York, NY, Nov. 17-18, 1982.] Enja 4044.

Performance: **Modernism from sterling quartet**

Recording: **Direct, vital and balanced**

The soprano saxophone has been dubbed the "straight horn" for the obvious reason: its size and shape. But in terms of its sound, the soprano is anything but straight. To the untrained ear, the soprano often sounds out of tune. But this, far from being its biggest weakness, is its principal strength; the soprano's rasp and grit, owing to the way it flattens notes and turns them "blue," imbues the sound with a distinctive edge, allowing both choppy, anguished bop runs and bittersweet lyricism. It can be innocent but never naive, hospitable but never patronizing.

As a result, in the hands of its exemplars, the soprano lends itself to a wide range of idiomatic expression: the balladic warmth of Sidney Bechet, the modal intensity of John Coltrane, the free-form excursions of Steve Lacy and the third-world fusions of Wayne Shorter. Standing foursquare in this aural and emotional tradition is Jane Ira Bloom, whose third album as a leader, *Mighty Lights*, attests to her place among this select group of players.

Unlike other reed players who specialize in alto or tenor but double on the soprano, Bloom plays the straight horn exclusively. This fact, coupled with her schooling (she earned a masters degree from Yale and also studied with George Coleman) and her basic musical aptitude, explains her rapid rise on the jazz scene.

Bloom distinguishes herself on three counts here—as leader, player and composer. Bloom the composer pens structured but open-ended tunes that allow Bloom the player to devise either linear or parabolic lines; thus, Bloom the leader can punctuate or encircle the improvisations of her colleagues: Charlie Haden, bass; Ed Blackwell, drums; Fred Hersch, piano. And the sopranoist wisely chooses cohesion over virtuosity. As the only horn player on the date, Bloom realizes that, with the players she has chosen, integration is the most direct route to innovation. Haden and Blackwell, partners in Ornette Coleman's seminal early '60s group and currently in Old and New Dreams, are to collective improvisation what Sly Dunbar and Robbie Shakespeare are to reggae *riddim*. Hersch, who appears on four of the six tunes here, demonstrates finesse and a flair for collective improvisation.

Producers Weber and Winckelmann, for their part, mirror the musicians' attitude by granting each instrument the space and volume it requires without allowing any one to predominate. Solo opportunities are shared by all, the highs and lows are kept in proper proportion, and the recording itself is impeccable, devoid of any surface imperfections.

Bloom's range on the soprano equals her fluency. She does, however, exhibit maturity and control by resisting the temptation, considering her ample technique, to flaunt her athletic prowess. Bloom plays cleaner than most sopranoists, but her sound coloration is off-white, hardly pristine. Like Lacy and the Norwegian Jan Garbarek, between whose tonality her own is situated, Bloom strives for clarity over cleanliness. Whether she plays long lines or short, staccato bursts or intricate arcs, Bloom paces herself superbly, ever mindful of the group dynamic.

Neither a firebrand nor an introvert, she varies her song structures and tempi to suit the emotional impetus behind each of her five original compositions (the sixth is the Leroy Anderson-Kurt Weil ballad "Lost in the Stars"). When she doesn't sustain a note, she twists it into a laughing yelp or abruptly bites it off. Her camaraderie with the trio is readily apparent in ensemble passages that, often unexpectedly, precede or follow sections in which she singles out a particular player for a *pas de deux*. On "Change Up," for instance, the soprano and piano start out in tandem, atop one another and totally in synch, with a series of arpeggios before the bass and drums enter. Bloom's soprano and Haden's bass open the title track with a *rat-a-tat-tat* Morse Code sequence. On "I Got Rhythm But No Melody," a boppish number, the brisk tempo suddenly drops, leading into a drum-bass exchange, which Bloom in turn makes into a musical *ménage à trois*. (The Haden-Blackwell duo also displays its derring-do briefly on "2-5-1.")

Bloom is clearly the leader on this date, but Haden, Blackwell and Hersch don't perform as sidemen or accompanists—they are co-equals and, as such, this quartet recording succeeds in every respect. GK



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Advertiser's Index

R.S. #		Page #
28	Abadon Sun	30
15	Audio + Digital	10
27	Audio-Technica	29
No #	Banner	75
25	BSR Inc.	27
23	Carver	23
12	Carvin	5
32	Connectronics	52
14	Countryman	8
18	Crown	14
16	Dahlquist	12
No #	dbx	21
No #	DeltaLab.. Cov. 4, 3,	11
17	DOD	13
21	Electro-Voice	19
30	Fender Pro Sound	32, 33
29	Fostex	31
13	Ibanez	7
26	Institute of Audio Research	28
34	Institute of Audio/Video Eng.	75
No #	LT Sound	Cov. 3
19	Mattel Electronics	15
22	Orban	22
37	PAIA	76
11	Peavey	4
33	Phoenix Systems	74
35	Polyline	76
20	QSC	17
24	Rocktron	26
31	Samson	50
10	Tascam div. of Teac Corp.	Cover 2
38	Trebas Institute	77

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