Audio

SEPTEMBER 1988 • $2.50

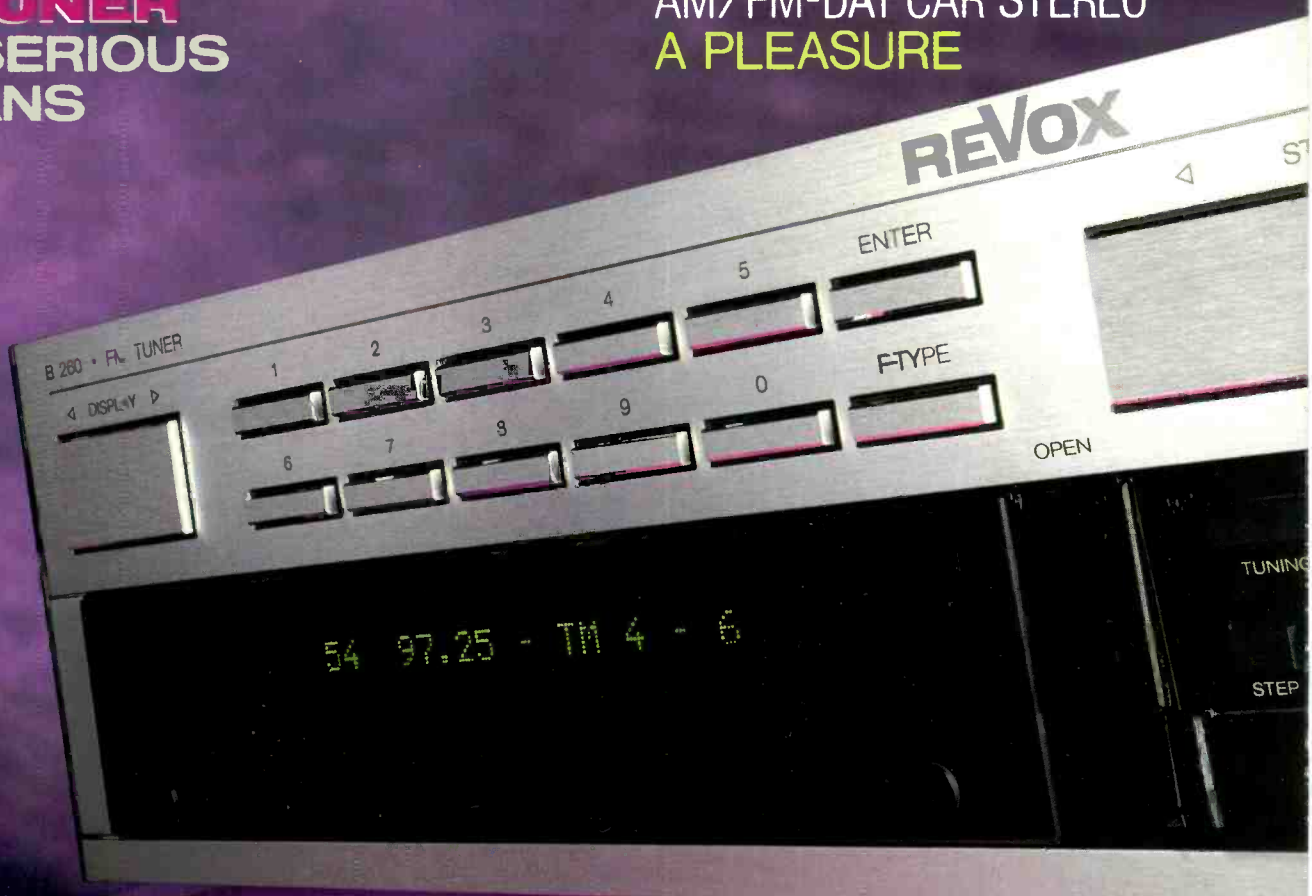
AUDIO RECORDING ON HI-FI VCRs

INTERVIEW
LEONARD FEATHER
A LIFE IN JAZZ

REVOX B260
FM TUNER
FOR SERIOUS FM FANS

TESTED
YAMAHA CDX-1110 CD PLAYER
AMONG THE FINEST

KENWOOD KDT-99R
AM/FM-DAT CAR STEREO
A PLEASURE



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Winston

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Pioneer's new car stereo amplifiers. They simply outperform anything else on the road.

Model Number	GM-4000	GM-3000	GM-2000	GM-1000
Max. Power Rating* EIA Power Rating	200 x 2 100 x 2	75w x 4 40w x 4	100w x 2 50w x 2	60w x 2 30w x 2
Freq. Response (Hz) (+0dB, −1dB)	10 – 50,000	10 – 50,000	10 – 50,000	10 – 50,000
THD (%) (1KHz, 4 ohms)	0.002	0.005	0.005	0.005

PIONEER®

 Model shown: GM-4000 *Both channels driven into 4 ohms, 20 to 20,000Hz.

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Audio

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MUSIC REVIEWS

DEPARTMENTS

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MPA

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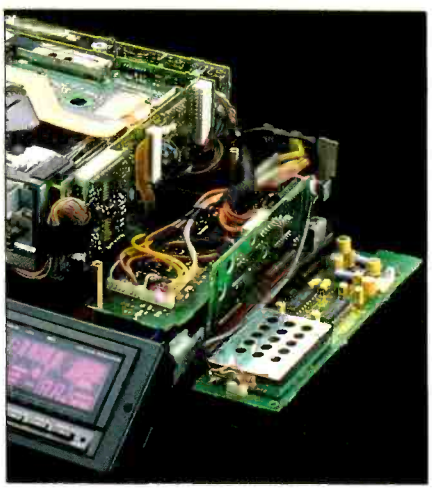

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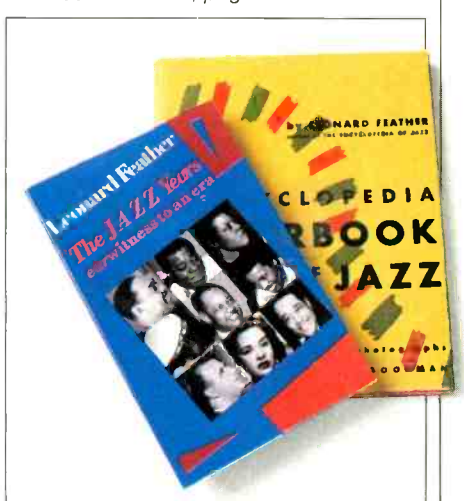

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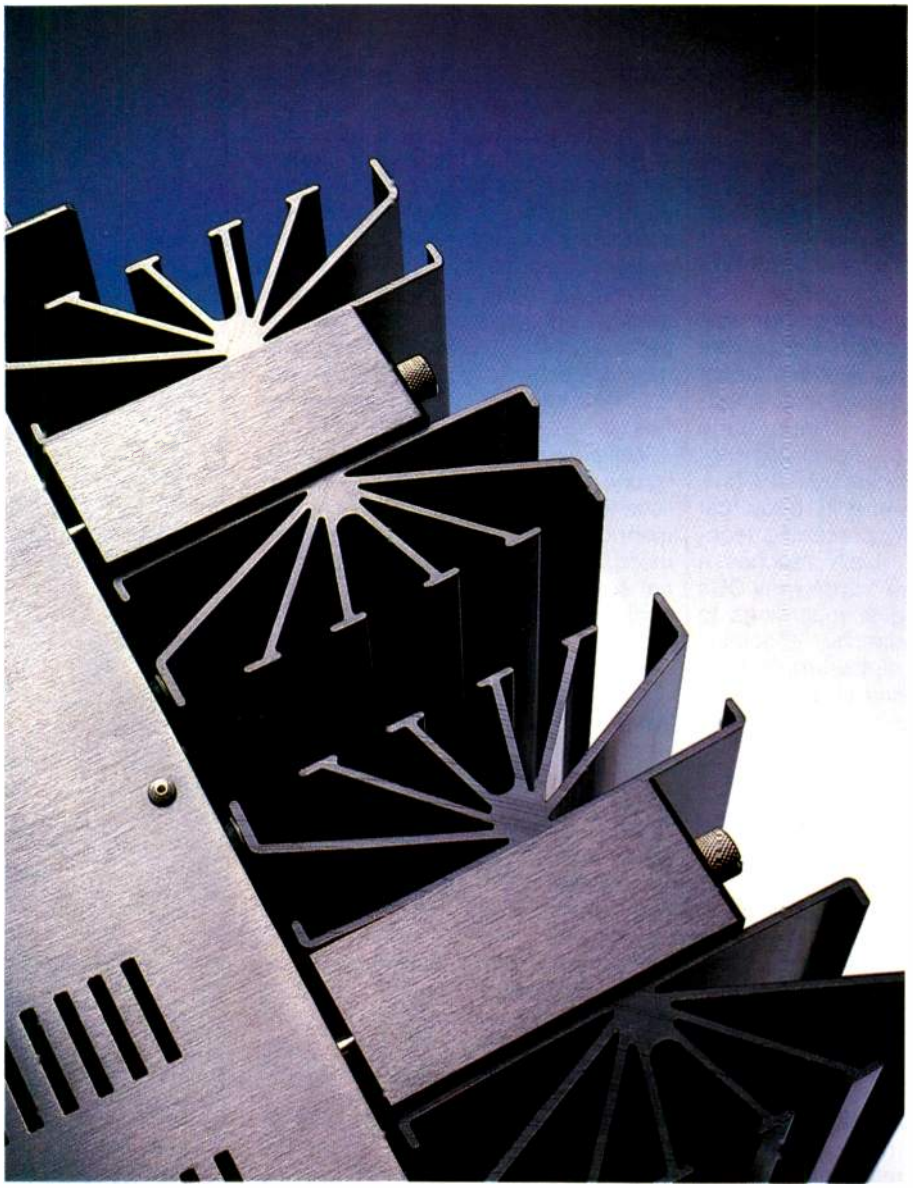
A VIEW FROM THE TOP



HEATSINK—July 1986

Spend some time with a Mark Levinson® component. As every work of art is unique, so it is with Mark Levinson products. The complete range of amplifiers and preamplifiers is crafted for music lovers who appreciate the subtleties within reproduced music and also demand a precise execution of the designer's imagination.

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SIGNALS & NOISE

Breaking the Code

Dear Editor:

All the talk about DAT and CD copy-prohibit code is absurd because the encoding only affects direct-digital copying. Any DAT or CD that is played back and converted to analog for amplifiers can also be recorded again in digital. My experience with digital mastering processors leads me to believe that 99% of the world's listeners cannot tell the difference between a direct-digital copy and one that's gone through digital-analog-digital copying. The extra analog conversion still produces a near-studio-quality copy that is far superior to any preceding technology. When DAT finally reaches a stable standard, I will transfer my CDs and EIAJ-format digital recordings to DAT, directly or indirectly. It doesn't bother me to make digital-analog-digital copies, and it's probably not going to bother many other people either.

Jim Sykes
Anchorage, Alaska

Vintage Lines

Dear Editor:

As a loyal subscriber to *Audio* for many years, I have delighted in reading the "Signals & Noise" column. This open forum has brought forth many facets of the audio world which are rarely discussed. One such topic, addressed by Robert W. Gamage in the March 1988 issue, was vintage audio components. While much older equipment has proven durable, only some tape decks—and, more importantly, amplifiers—can be referred to as state of the art. These units can compete with the best gear on the market today. The three-dimensionality which can be obtained with a pair of McIntosh tube amps or Marantz Model 9s can only be described as breathtaking.

Anyone who is skeptical of this well-kept secret need only glance at the "Wanted to Buy" section of any current *Audio*. The demand for these amps far exceeds the supply—mainly because they haven't been manufactured in more than a quarter of a century.

Many audiophiles who subscribe to the "purist philosophy" are now awakening to the fact that these amplifiers, with their storybook-simple tube circuitry, are far more transparent than many of the highly touted "hybrid" units available today. In acquiring such vintage equipment, one will almost invariably save many audio dollars (which can then be spent on associated components or software). Other rewards will include reliability (ask an owner of any other tube amp how many sets of tubes he or she goes through annually), sound quality surpassed only by the ultra-high end, and, most importantly, a piece of gear one can take pride in owning and whose design has stood the test of time.

While I don't wish to regress into the "glory days" of colored hi-fi, I do believe that these amplifiers can complement even the best modern equipment. With digital audio used as a signal source, these antiquated components can finally prove their worth.

Richard Duplantis
New Orleans, La.

What's Bugging Big Brother?

Dear Editor:

What jumped out at me from between the lines of Barry Fox's article, "Deciding on DAT: Witness of the Persecution" (March 1988), was that the monied interests are desperate beyond reason to get this copy-protection scheme in place. Given the existence of two protection programs already in place (sampling frequency and the copy-inhibit flag), and given the industry's failure to provide any sound reason—other than fear of pirating—I wonder why all the frenzy.

At first, I thought it must be the excessive greed of the corporate vultures. However, not that much pirating really goes on, and any pirate with enough at stake will find a way around all the regulations anyway. It also seems naive of the record industry to have rich stars plead their case for them if the loss of revenue is really the issue. Finally, the fact that the corporate executives only showed up at the first demonstration in London—and not at the second, where the critical listening took place—indicates that the music itself is of little concern to them.

The question remaining is: What is it about digital recording, and DAT in particular, that is *really* scaring these people? Something as-yet unrevealed is making Big Brother nervous.

Will Wright
Seattle, Wash.

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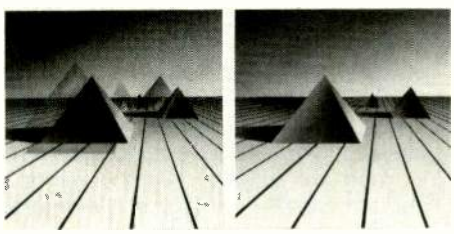
THE TX-11a COMBINES CARVER'S REVOLUTIONARY ASYMMETRICAL CHARGE COUPLED FM DETECTION CIRCUITS WITH AN AM STEREO SECTION CAPABLE OF FM-QUALITY RECEPTION.

The Carver TX-11a Stereo AM-FM Tuner is the most complete high fidelity broadcast reception component ever offered. It is a technical tour-de-force which further distances Bob Carver's unique products from traditional electronic components. First, by eliminating forms of FM distortion and interference that even the most expensive tuners available can't correct. And second, with a unique additional tuning section capable of making AM stereo sound as good as FM!

THE SILENT TREATMENT. While AM stereo may not yet be available in your area, you *can* receive FM stereo. Including stations so fraught with interference and distortion that you may be tempted to return to mono AM. That's why the TX-11a includes the first circuitry to remove hiss, "picket fencing" and the myriad other unpredictable noises which often disturb FM listening. Without reducing stereo imaging, frequency response or dynamic range.

Part of the FM signal, the left minus right portion, is extremely prone to "ghosting," or multipath interference caused by hills, buildings and other obstructions. Bob Carver's Asymmetrical Charge Coupled circuitry cancels distortion-causing "dirty mirror" images before they can reach your ears. It filters out noise and restores the part of the signal needed by our ears and brain to construct stereo imaging. Reintroduced into the mono (L+R) signal matrix, a net reduction of 93% – or better than 20dB of noise reduction – is achieved. All ambient and localizing information is recovered. Only hiss and



distortion are left behind. Or, as *High Fidelity* magazine put it, *"...clean, noise-free sound out of weak or multipath-ridden signals that would have you lunging for the mono switch on any other tuner."*

Ovation magazine observed that the circuit, *"...may well mean the difference between marginal reception of the station signals you've been yearning to hear and truly noise-free reception of those same signals."*

Audio magazine called it, *"An FM tuner breakthrough."*

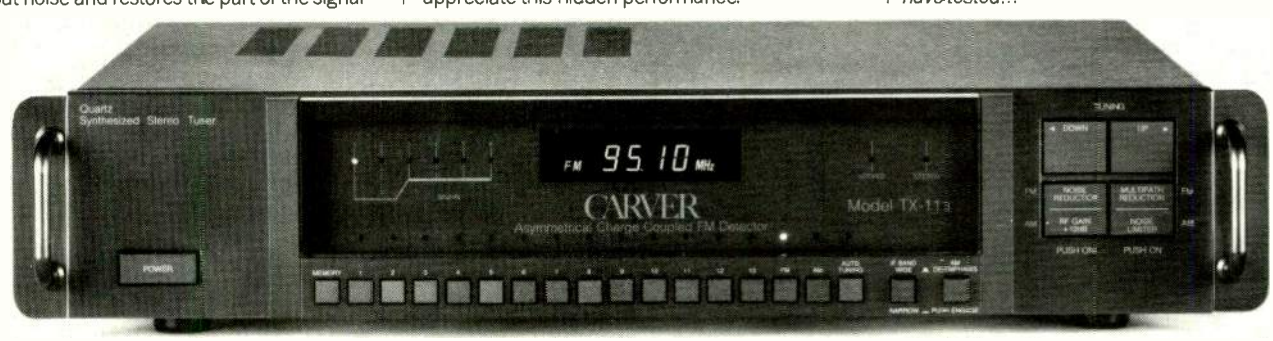
THE FIRST AUDIOPHILE AM STEREO CIRCUITRY. Contrary to popular belief, most AM stereo stations have frequency response (20-15kHz), separation (35dB) and signal-to-noise ratios (70dB) *audibly indistinguishable* from FM stations of equal strength. But only Carver offers the technology to appreciate this hidden performance.

At a press conference in front of America's top stereo writers, Bob Carver unveiled a low powered C-QUAM format AM stereo broadcast transmitter with a Carver Compact Disc Player as a source. The CD source and the TX-11a were also routed directly to a preamplifier and speakers for comparison.

When Bob switched back and forth, most listeners had difficulty distinguishing between the straightwire CD player and the TX-11a's over-the-air AM stereo reception! Many could tell no difference at all!

HUMAN ENGINEERED FEATURES AND CONVENIENCE. The TX-11a is designed to make enjoying FM and AM easy, not dazzle you with flashing light and complex programming. Thirteen presets, wide/narrow band selection, automatic/manual scanning as well as Multipath and Noise Reduction buttons are inset into the burnished anthracite metal face. Full instrumentation including digital display, 6-step signal strength LED's and other monitor functions are tastefully recessed, visible but not garish. The result is performance without theatricality, access without complication.

CLEAR THE AIR by visiting your nearest Carver dealer. Ask to hear the most expensive tuner they sell. (It probably won't be the Carver TX-11a). Tune a multipath-ravaged, hiss-filled FM station on it; then the same station on the TX-11a Stereo AM-FM Tuner. Now press the Carver Multipath and Noise Reduction buttons. You'll hear why High Fidelity Magazine called it, *"By far the best tuner we have tested..."*



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AUDIOCLINIC

JOSEPH GIOVANELLI

NR in Hi-Fi VCRs

In his "Audioclinic" for January 1988, Mr. Giovanelli incorrectly stated that noise reduction is neither needed nor used in Hi-Fi VCRs. In fact, it is both needed and used to achieve the high S/N ratio of 80 to 90 dB. The VHS Hi-Fi standard mandates an NR system using peak level detection.

There used to be serious incompatibility problems with Hi-Fi VCRs, a fact to which none of the reviewers paid much attention in their test reports. Some of the first-generation models had as much as 8 dB of difference between their 0-dB levels. [Editor's Note: According to some authorities, the problem only affected some commercially recorded tapes.] Problems also arose from deviations in the variable (level-dependent) frequency emphasis used in the NR circuit, which is very similar to Dolby B NR.

The reason for employing Dolby B NR on the VCR's longitudinal *audio tracks is most likely the infamous "breathing" effect. The inherently low S/N ratio of the longitudinal tracks creates an audible breathing effect with a fixed-frequency-emphasis NR system such as dbx. The Dolby NR system, however, uses a variable frequency emphasis which is less prone to breathing.*—Leo Backman, Helsinki, Finland

Loudspeaker Power

Q. I am powering a pair of loudspeakers with a receiver capable of 10 watts per channel. The speakers are marked "25 watts capacity." I read in a dictionary that capacity means maximum. Does this mean that I am really limited to using 25 watts? Is there any possibility of using 30 or perhaps 35 watts?—Richard Gumner, Washington, D.C.

A. If your loudspeaker is marked "25 watts capacity," the theoretical maximum amount of power it can safely handle is 25 watts. Driving it with more power than recommended will damage the loudspeakers. This damage may take a little time to accrue if the overload is small. If the damage is significant, the speakers may be blown out immediately.

If the instructions indicate that the speakers require 25 watts for average listening conditions, the loudspeakers probably can handle considerably more power. It is also likely that the maximum power-handling capacity is indicated in the instructions.

Given all of what I have told you, it is still possible, and desirable, to use a receiver rated at 30 or 35 watts to drive those speakers. Because you are now using a receiver capable of 10 watts per channel and are reasonably happy with the volume of sound produced, it's unlikely that you will require any more power than 35 watts.

If you drive your 10-watt receiver to maximum, you can damage your tweeters because of amplifier clipping. This damage could be of more consequence than what might result from driving your loudspeakers with slightly more power than is recommended. Of course, if you overdrive a more powerful receiver, amplifier clipping will occur and speaker damage is even more likely than when using the 10-watt unit.

The ideal arrangement is to use a receiver having a bit more power than your speakers can handle, but *never* drive the amplifier beyond the power capacity of your loudspeakers.

More About Humidifiers

I am taking the liberty of commenting on an item in "Audioclinic" (January 1988) which dealt with ultrasonic room humidifiers.

I have a suggestion as to how to reduce or eliminate the calcium-carbonate dust produced by these humidifiers. Use hot *water to fill the tank. Most home water heaters have conditioners which treat the water to prevent this lime buildup in the heaters themselves. Hence, by using the treated water, you stand a better chance of avoiding the white dust without other, more elaborate water conditioning.*

I would suggest, however, that you allow the water to cool before attaching the tank to the humidifier.—David E. Licht, Jackson Heights, N.Y.

Rain Static

Q. What is "rain static"?—June Thomas, Wantagh, N.Y.

A. Rain static is a phenomenon I have only noticed on VHF bands, including the FM broadcast band. When it's really coming down in buckets, you may hear a kind of "chattering" as a background to the station to which you tuned. It is most noticeable when receiving weak signals.

If you are using an indoor antenna, you'll never be bothered with this kind of interference. (It's about the only advantage I can think of to using an indoor antenna, except when it is your only recourse.)

I have not been able to verify this, but it appears that the friction produced by the tremendous quantity of rain moving over the surface of the outdoor antenna produces a charge and discharge which create noise just as a car's ignition system might.

Questions, Please?

I know this question will sound stupid to you, but . . . .

Questions which start like that (I've been getting them for the 30 years I've been writing "Audioclinic") remind me of two sayings: "There are more foolish or stupid answers than foolish or stupid questions," and "If you ask a question, you may feel like a fool for five minutes; if you don't ask questions, you'll be a fool for life."

Even though I've been playing around with audio since 1947 or earlier, I keep on asking questions, too. Many of my long-time readers know that my formal electronics studies began and ended with high school, and that I cannot see (which makes it impossible to do even a fraction of the reading I should do). My best teacher is hands-on experience. I've taken CD players apart and played with the transports' mechanical alignment to see what would happen. I've also worked with a DAT recorder that had a manual written in Japanese.

So don't think I'm judging the "dumbness level" of your questions. I only make judgments about which questions are suitable for inclusion in "Audioclinic." Even those questions *Audio* doesn't print are answered by mail. That is true for the "Tape Guide" column as well. I might have a backlog which would keep me from answering as quickly as I would like to, but unless a letter gets lost, it will be answered.

If you have a problem or question about audio, write to Mr. Joseph Giovanelli at AUDIO Magazine, 1515 Broadway, New York, N.Y. 10036. All letters are answered. Please enclose a stamped, self-addressed envelope.

The AR Expert

Name: Mark Nazar
Occupation: Chief Engineer
Years with Teledyne Acoustic Research: 7
Objective: Design quality into AR products

Q. When you're designing a loudspeaker, what do you think is most important in terms of quality to the consumer?

A. You always have in mind how the system will be utilized out in the field. What kind of environment is it going to be put into; what kind of amplifiers; what size of amplifiers it may be driven with. You start to design the loudspeaker itself with that in mind using high temperature adhesives and different assembly techniques to ensure the longevity of the product. Once we are certain all of the individual components will contribute to a good reliable product, we can start to concentrate on the most important aspect of the design: sound quality.

Sound quality is such a multi-faceted type issue. There are so many different elements involved. You have the loudspeaker drivers themselves and all of their associated elements — the cones and coils and adhesives and everything else. You have cross-over networks and they have a variety of components that make them up as well and we have established certain guidelines and specifications for all of those components. And then there are cabinets. We're learning more and more about the reradiated effects of the cabinets after they start to resonate. We're using the resonance dissipation grooves on the inside of the cabinet to help control these effects as well as acoustic blankets which help control reflections off the grill frame, etc. That in turn helps to give more precise imaging characteristics. All of these design elements are considered and refined until a close approximation of the final product is arrived at. Once we reach that point the product is completed using the ultimate measuring device, the human ear. Once extensive listening sessions are complete, the final hurdle for every system is the AR power test.

Q. Explain how Acoustic Research does the power testing.

A. Our power test is configured to be representative of typical amplifiers that you can find out in the marketplace. What we do is take a loudspeaker and we assign it a value. Say we want the loudspeaker to carry a 100 watt rating. Going into the power test, we calculate what voltage the amp will be running at in order to deliver 100 watts to the speaker. We multiply that by 2½ times to assign a peak power rating for the test itself. A 100 watt rating on a loudspeaker will actually be driven at 250 watt peaks. We set the system up in the power test room and the amplifier is calibrated to clip 10% of the time using an actual music album that was also carefully chosen for its energy content. It provides a typical energy spectrum where most of the energy is fed to the midrange units. The bulk of long sustained type energy is fed through the bass units and typical energy spectrum is fed to tweeters found on a wide variety of music albums on the market.

The test is set up and it is run for 500 hours continuously. The product must withstand the test. It must pass in good order without any failure whatsoever. If there is a failure, we'll go back into the system to determine what was the failure mechanism and make the appropriate changes until the system will pass the test. What this had led us to is a very small reject rate or failure rate out in the field due to excess of power being fed to the speakers. It is generally said that when we put a power rating on a loudspeaker, that's really what it will do. Some other manufacturers may rate their loudspeakers in peak watts which is kind of unfair because the consumer doesn't really know what peak watts means. He sees peak watts and he says — 100 peak watts; that means I have 100 watt amplifier — no problem. And they go and they wail on their loudspeakers and break them.

Q. Characterize Acoustic Research loudspeakers in the "quality designed in" concept.

A. Acoustic Research loudspeakers have been designed over a long period of time when you look at the company, because we learn continuously and that knowledge is passed from one person to another so it always builds. So today's Acoustic Research loudspeakers really represent the best total package loudspeaker value we have been able to design in our 34 year history. It includes everything we've been talking about. It's quality, longevity, it's everything; it's good looks, integrity — the whole package.

Loudspeakers are much more complicated devices than people really understand. So many think it's an art. It is an art, but there's a lot of good engineering common sense in a loudspeaker as well. And you have to keep pushing forward with the technology to keep the quality level up.

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TAPE GUIDE

HERMAN BURSTEIN

Taping CDs (Again)

Q. I understand that you cannot record a CD from the digital output of a CD player directly into the digital input of a DAT deck. Could you connect the CD player to an amplifier and then to the DAT deck for recording, or would the DAT deck still pick up the copy-inhibit flag to prevent the deck from recording?—Matt Bacon, Humboldt, Neb.

A. There is no legitimate way to circumvent the copy-inhibit flag of a Compact Disc for direct digital copying. Furthermore, digital copying is inhibited by the different sampling rates for CD and DAT (44.1 and 48 kHz, respectively). But these factors do not prevent DAT copying from the *analog* output of a CD player. Moreover, assuming high-quality equipment, a DAT recording made from a CD player's analog output is usually of such high quality that it is barely (if at all) distinguishable from the Compact Disc.

Recording via an amplifier would not change the situation. There would be no inhibition against recording signals via analog connections between the amplifier and the DAT recorder. If digital connections were used from amp to recorder (which some new amps allow), all flag bits would presumably be passed on with the rest of the signal. In any case, the incompatibility between the sampling rates would still prevent recording.

Hum

Q. Lately, my audio system has been producing an extremely obtrusive hum. I have traced it to the right output jack of my cassette deck. Any advice?—Mark A. Ortega, Albuquerque, N.M.

A. The cable between the jack and the rest of the system may be defective or not securely connected at one end or the other. Detach the cable, and then reinsert it tightly with a twisting motion. If this doesn't help, try a different cable. If you don't have an extra cable, temporarily borrow the left one. A good cleaner, such as Cramolin, will help here too.

Another possibility is that the right output jack is not properly grounded. There could be a cold-solder joint which looks okay to the eye but isn't. To check this, you'll have to go inside the deck. The cold-solder joint could be either at the ground side of the jack or where a lead from the jack goes to ground. Unless you have the necessary technical know-how, you should leave the task to an audio technician.

The hum could also be originating somewhere in the playback electronics—including in the power supply for the right channel—or it could be due to a poor connection between the playback head and the playback electronics. It might be that you're hearing r.f.i. or e.m.i. radiation from some piece of gear to this right output jack of the cassette deck. I would suspect this if you suddenly started hearing the hum after moving the equipment around. This isn't the most likely of sources, however.

Hi-Fi VCR Use

Q. I have a hi-fi VCR and have used it to record audio from CD and other sources. Do I need a PCM processor with the VCR to make live recordings?—Charles Scott, Wichita, Kans.

A. When set in the hi-fi mode, a hi-fi VCR employs FM modulation of the audio signal to make a recording. When either a hi-fi or conventional VCR is used with a PCM unit, it makes digital recordings.

Hi-fi VCRs produce excellent frequency response, high signal-to-noise ratio, low distortion, accurate and stable speed, etc. The results are quite comparable to those obtained when using a PCM processor with a VCR. While a VCR-PCM combination may be measurably (though slightly) superior to a hi-fi VCR, it is not likely to be audibly superior.

In sum, I feel there probably is no advantage to recording with a PCM processor.

Low-Price Decks And High-Price Tapes

Q. I presently own a dual cassette deck costing under $200. It has worked great with Type I and II tapes for over a year. Because of metal tape's high cost, I never used it until last week. After recording on it, I noticed excessive distortion in playback. Since my deck does not have a front-panel bias selector, I have to assume that the automatic sensing mechanism for tape type is working properly and providing proper bias. Following the deck manufacturer's instructions for metal tape, I let the deck's meters peak at +5 dB. The distortion, while most noticeable in the low bass, is also audible in the upper midrange. It sounds to me like intermodulation distortion: When a low bass note occurs, the upper midrange and the high end break up.

I noticed that another tape manufacturer, Memorex, does not make metal tape, giving this reason: "We feel that most cassette decks are not properly matched to these tapes because of circuit or head design, delivering insufficient bias and causing distortion." Could this be true, or am I overlooking something?—Keith Richardson, Mason City, Iowa

A. Metal tape, as contrasted with the other types, requires much more bias; it could well be that your deck doesn't supply enough for the brand you bought, or perhaps for any brand. If treble is accentuated, this confirms that bias current is insufficient. Metal tape also requires considerably more audio signal current to the record head, and your deck may be inadequate in this respect. In other words, the higher level of required signal current may be overloading the record electronics.

Further, the record head must be of superior construction to drive the required amount of bias current through it. When metal tape first appeared, existing record heads could not handle that much current. Therefore, compromises were made in the manufacture of metal tape, reducing its coercivity below that which was feasible, and thereby reducing its ability to achieve superior treble response. Even today, such compromises may be in effect. It is likely that a relatively low-priced deck such as yours has an inadequate record head for use with metal tape.

All in all, it seems that Memorex's statement applies to your deck. Fortunately, you can still do very well with Type I and Type II tapes.

If you have a problem or question on tape recording, write to Mr. Herman Burstein at AUDIO, 1515 Broadway, New York, N.Y. 10036. All letters are answered. Please enclose a stamped, self-addressed envelope.

The Onkyo Integra TA-2800
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For most people, a cassette deck is an essential part of a high fidelity system. After all, it is the only component designed to preserve a musical event. But frustration often results when that preservation is incomplete, when the cassette deck isn't as good as the music.

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Our designers realized that the deck's mechanism and the cassette were actually one system. This resulted in a unique three motor dual capstan transport for vibration-free alignment between heads and tape. And even smoother tape motion.

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Dolby HX Pro provides extended high frequency response for more lifelike musical experience with any tape. And, a unique Real Time Counter shows you exactly how much tape you've already used and how much tape is left.

Remote control using Onkyo's new RI (Remote Interactive) system is standard. So you get convenience and compatibility with a growing number of equally impressive Onkyo high fidelity components.

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Recently, at a carefully selected location in Milford, Pennsylvania, some of the most discerning ears in the business were invited to hear something they'd never heard before. The Altec Lansing Bias™* 550. The first speakers in the world with Pentamplified sound.

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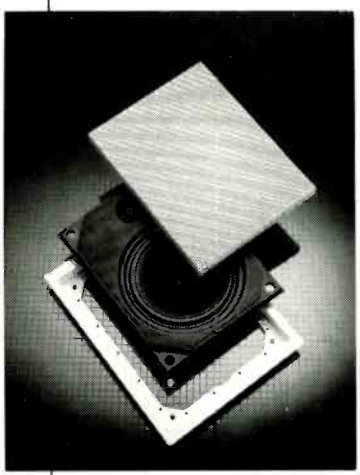
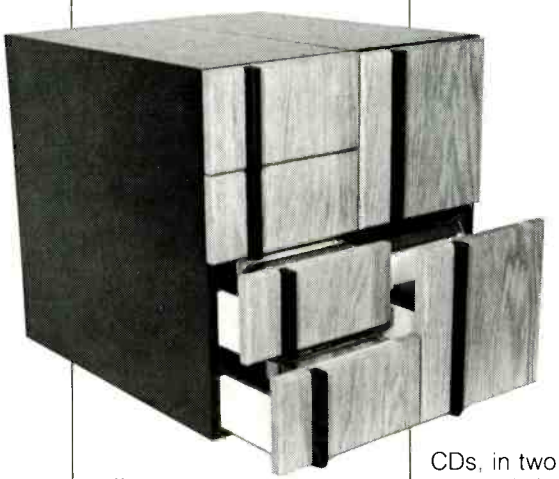
Clarion Car Equalizer/Booster

The input circuits of the 51 EQ are flexible enough to allow its use with any head unit. Front/rear outputs and a built-in fader allow its use with separate front and rear amplifiers. The five-band unit features an EQ defeat switch and LED level indicators. Hardware for both in-dash and under-dash mounting is supplied. Price: $99.95.
For literature, circle No. 100



KEF Built-In Speakers

Optimized for in-wall rather than stand-alone mounting, KEF's Custom Series speakers include the CR200F two-way system (shown) and the CR250SW subwoofer. Frequency response of the two-way system alone is 55 Hz to 22 kHz, ±2 dB; the subwoofer extends it down to 32 Hz (−10 dB at 25 Hz). The CR200F requires a mounting depth of only 3½ inches, and the subwoofer requires just ¼ inch more. Price: CR200F and CR250SW, $550 per pair.
For literature, circle No. 102



Hills Tape and CD Cabinets

These matching "file drawers" are designed to fit into the shelves of most audio/video cabinets. The Tape-Box (foreground) holds 64 cassettes, in four drawers; the CD-Box (background) holds 60 CDs, in two drawers. Both are available in oak, dark oak, walnut, or black-lacquered oak. Price: $64.95 each ($69.95 in walnut or black lacquer).
For literature, circle No. 101

Onkyo Dubbing Cassette Deck

Not only Dolby B and C noise reduction, but Dolby HX Pro headroom extension are featured on the TA-RW490. Both of its auto-reverse transports can record, either for tape copying or for sequential recording times of up to three hours when using two C-90 cassettes. Both transports also feature real-time counters and multi-selection music search. Price: $629.
For literature, circle No. 103

Brüel & Kjaer Microphone

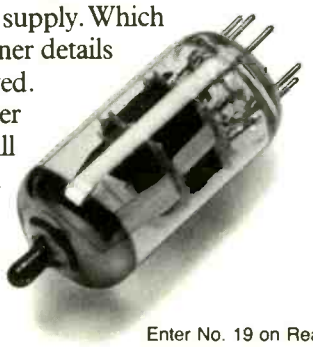
The Type 4011 is a cardioid condenser microphone designed for flat on-axis response (rated at 40 Hz to 20 kHz, +1, −2 dB) and uniformly smooth off-axis phase and frequency response. Equivalent noise level is typically 19 dBA re: 20 µPa, and maximum input is 158 dB SPL before clipping. Distortion is rated at 0.5% for 110 dB SPL input. A switchable, 20-dB attenuator is built into the microphone. The Type 4011 comes complete with windscreen, cable, and maximum-grip holder; an optional clip permits easy removal for stage use, and a shock mount is also available. Price: $1,395 each.
For literature, circle No. 104

People will always listen to a good idea.

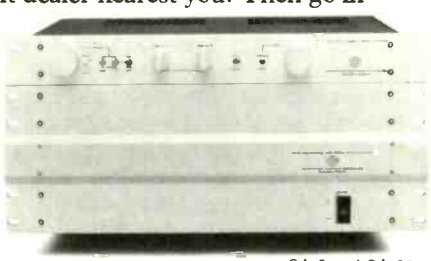
They may be skeptical at first. But eventually, the simplicity and power of a good idea will succeed.

The vacuum tube is just such an idea. That's why Counterpoint set out to perfect tube technology more than ten years ago. Today we've succeeded in making the most musically accurate preamps and amplifiers ever created.

For example, take our SA-5 preamplifier. It's the only preamplifier on the market today with a fully vacuum tube regulated power supply. Which means that all of the subtle inner details of your recordings are preserved. Coupling our SA-5 preamplifier with our SA-20 power amp will insure that your music's detail will not be lost. The SA-20's renowned power (1000 watts peak into 1 ohm!) won't leave your speakers hungry.



Call **800-247-6468 (in California 619-598-9090)** to find the Counterpoint dealer nearest you. Then go in and listen. It's the only way to tell if what we say rings true to you.



SA-5 and SA-20

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Modern Modularity

For serious listeners, the one-piece in-dash car stereo has long since given way to at least a two-piece system of separate head unit and amplifier. In the past, players for new media have gone outboard of the main head unit until they're accepted as mainstream; then they're swallowed up by the head unit. When car owners want multiple media, however, one head unit can't hold it all. Consequently, the system grows a bit more modular, as in the new systems from Pioneer and Sony which allow dash-mounted radio/cassette head units to control trunk-mounted CD changers. With DAT as an added choice, we'll probably see more variations on the theme.

But even traditionally united entertainment media may be coming to a parting of the ways. In at least one 1988 vehicle, the GMC Sierra pickup truck, the sound system includes a separate radio, tape player, and equalizer. With a setup like that, it would be a cinch to swap the cassette unit for a CD or DAT player or to keep the cassette and add a digital player in the equalizer's place, assuming all the units were the same size and had matching plugs. Another '88 vehicle, the Lincoln Continental, will allow swaps of this kind: When optional DAT players were introduced this May, they were direct, plug-for-plug replacements for the Compact Disc players already offered with the car.

Separate the functions still further, by separating the master audio control from the tuner, and you have a matched component system with advantages for both seller and buyer. Like the buyer of home components, the buyer of a car system could not only pick just the combination of media desired, but could also buy plain or fancy units of each type, according to how much importance he attached to each medium. An FM-oriented buyer might opt for a super tuner plus simple players for CD and tape; another buyer might want the best possible digital players while being content with just enough of a tuner to pick up local news and weather reports. The seller would be able to offer many systems while stocking only a comparatively small number of component modules.

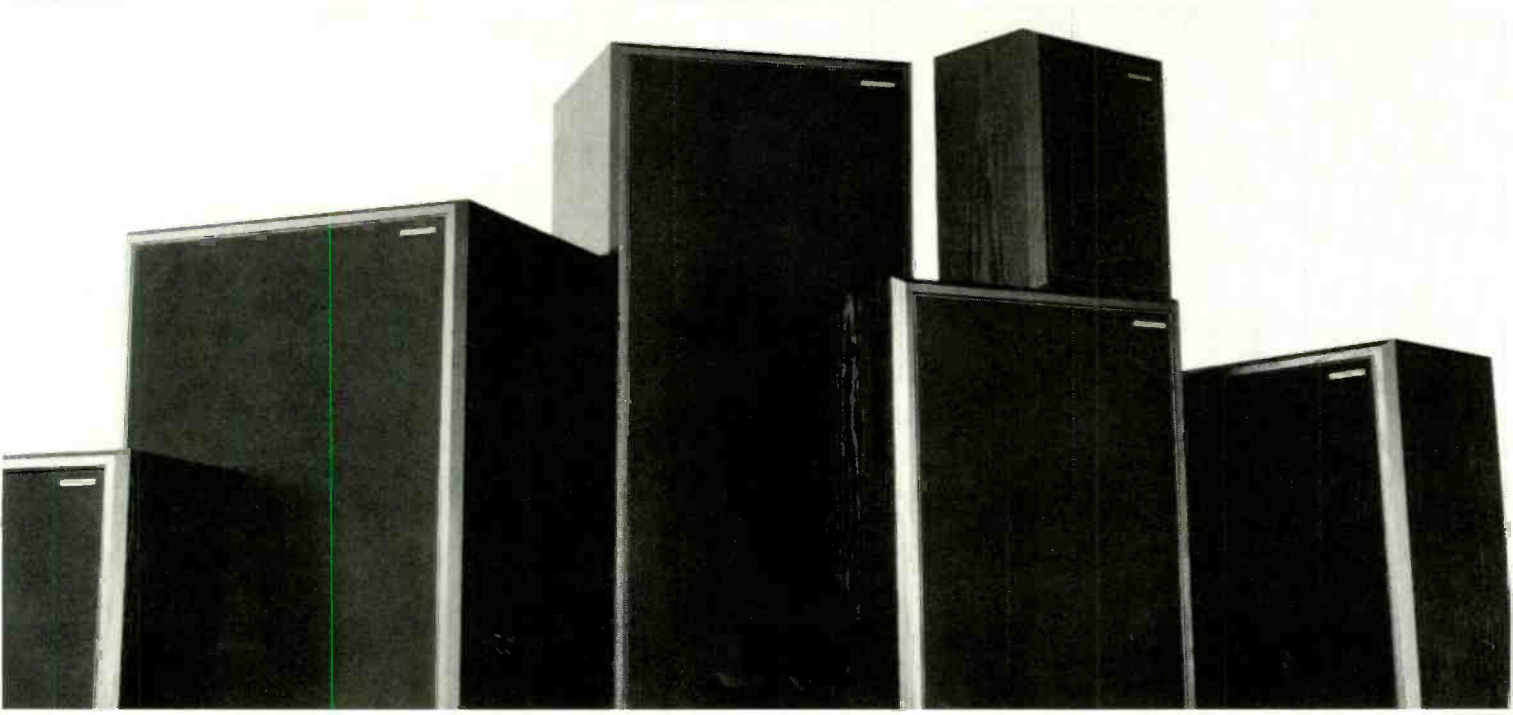
Stalk-mounted control module of Clarion's CD changer.

A system's convenience could also be enhanced by equipping the master unit with the basic controls for all possible modules, then putting it in the spot most convenient to the driver—and possibly duplicating it in other locations around the car. The basics could include volume, mute (which would also actuate the appropriate player's pause control), balance, and tone controls, plus buttons whose functions would change according to which unit was playing. One pair of buttons could, in tuner mode, seek the nearest station up or down the dial; in another mode, it could seek out the next or previous track on a CD, cassette, or DAT. A "Change" button could shift the tuner between FM and AM, reverse a tape, or switch to the next disc on a CD changer. A small display could be provided to tell you which source was playing. More elaborate controllers might have 10-button pads which could be used for station-preset memories, CD or DAT track selection, and so on. If the unit could be made pocket-sized and removable (like the audio/tuner control head of Blaupunkt's Dallas SQM 88 radio), this would discourage thieves too. Less basic functions would be on whichever other modules required them: Noise reduction and tape equalization would be on the tape deck, switches for bandwidth and local/distant reception would be on the tuner, and index and repeat controls would be on the CD and DAT players.

This approach is far from new. Aside from the control head, what I am describing is very similar to home component systems and to the component systems which some companies offered for car use in the '70s. One reason those car systems failed to catch on, at least outside of Japan, was that they followed the home precedent too slavishly, at the expense of the human-engineering requirements which are so important in the car.

I think the component concept *is* viable, as long as the car's requirements are kept in mind. My suggestion for a compact master control unit is a start in the right direction. More could be done in terms of ergonomics by breaking the functions down still further: Displays could be placed in the driver's field of view while the controls were placed wherever they could most conveniently be reached. The radio controls could be split from the tuner circuits, so one could order a control head for the special features it offered and a tuner section for its performance level. Mounting these tuner circuits right at the antenna would make it easier to offer diversity reception as an option and would reduce pickup of r.f. noise; however, it would increase pickup of noise in the audio band, which is more of a problem in the car.

As the number of components which make up a modular system rises, so too will the cost of acquiring and installing such a system. However, removing it will become more of a problem too. That might deter thieves; at the very least, it will increase the odds that you'll still have a lot of your system left after the thieves have run off.



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As the inventor of the Compact Disc format, Sony continues to expand the limits of digital reproduction. Yet, while proudly leading this revolution, the Sony ES engineers have been equally conscientious about designing analog components that fully realize the potential of the digital era. This uncompromising commitment defines the entire ES Series.

The CDP-707ESD:
Simply stated..."the reference against which to judge" others.—*Len Feldman, Audio Magazine.*

Historically, Sony ES Compact Disc players have been the benchmark for advancing the state-of-the-art. The CDP-707ESD is no exception. As the world's first CD player to incorporate dual 18 bit linear D/A converters, along with a proprietary 8X oversampling digital filter, it brings the listener closer to the theoretical limits of Compact Disc performance. This advanced technology provides greater low level signal resolution and improved linearity, for more faithful reproduction of musical depth and detail.

And there's more to the ES Series than the CDP-707ESD, and its host of sophisticated features. You'll find our advanced 8X oversampling filter technology in the less costly CDP-507ESD, as well as the CDP-C15ESD, which combines 18 bit linear D/A converter performance with 10-disc changer convenience for the very first time.

The STR-GX10ES:
The quality of separate components in a fully integrated design.

Traditionally, few receivers have offered the performance necessary to meet the demands of digital sources. These demands on receiver technology come at a time when the requirements for total audio and video integration have created more compromises than ever before.

To avoid those compromises, Sony created the STR-GX10ES, with 150 watts-per-channel. It, along with our full line of receivers, achieves unsurpassed musicality, thanks to a unique Spontaneous Twin-Drive amplifier stage that eliminates power supply fluctuations, regardless of current demand. Add to this such refinements as discrete outputs and a non-resonating G-Chassis™ design, and you have accurate reproduction of music detail and dynamics even under the most demanding speaker load conditions.

Yet the STR-GX10ES also brings you the convenience of total integration with a supplied Remote Commander™ unit that allows for control of virtually any infrared audio or video component, regardless of brand. And with its special high resolution S-Video circuitry, the STR-GX10ES is compatible with components you might buy in the future.

The TC-WR11ES:
Finally, a level of performance never before achieved in a dual-deck design.

Accurate reproduction of digital source material has placed a heavy burden on the finest analog cassette decks. A burden compounded in dual-well designs, where compromises are often made for operating convenience.

The uncompromising new Sony TC-WR11ES is a magnetic and mechanical accomplishment that rises to the digital challenge by combining superb music reproduction with ultra-sophisticated operations. A unique 210 kHz Super Bias™ circuit extends frequency response, without the beat frequency noise that's typical of high speed dubbing decks. Even at normal speed, the TC-WR11ES, like all ES cassette decks, achieves clean, transparent recordings, plus an astoundingly uniform 20-20,000Hz (+/– 3dB) frequency response. Add to this the patented Laser Amorphous heads and 4-motor transport, and the TC-WR11ES indisputably demonstrates the technical refinement needed to triumph in the digital age.

The Sony ES Commitment.

The Sony ES Series is a skillfully crafted line that not only includes the finest Compact Disc players, but superb analog components as well, all doing full justice to the ES engineers' exceedingly high standards. Further expression of this excellence is reflected in the 3 year limited warranty that backs each and every model (see your authorized Sony ES dealer for details).

For more information on where you can audition the full line of Sony ES components, call 201-930-7156.

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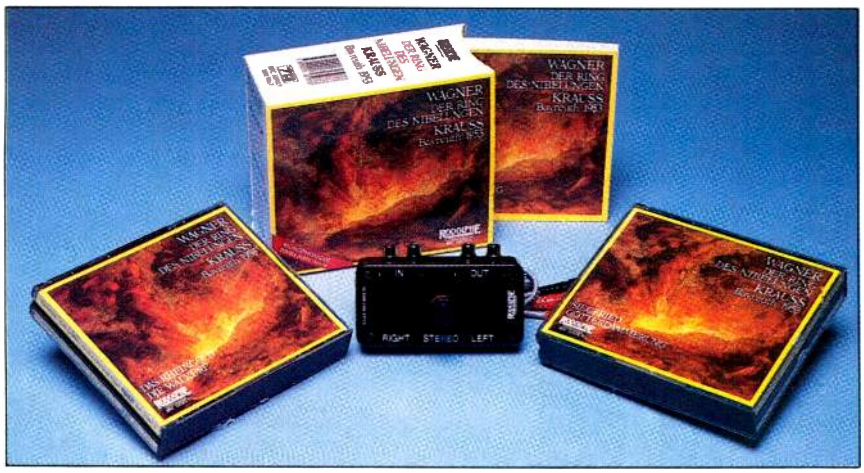
IVAN BERGER

RECORD TIMES



Compact "Ring" Cycle

It's no surprise to find a complete performance of Wagner's *Der Ring des Nibelungen*, a cycle of four operas, running 14 hours and 14 minutes. What is surprising is that the Rodolphe Productions recording of "The Ring" fits onto just seven Compact Discs—an average of more than two hours per disc.

The performance, from the 1953 Bayreuth Festival, was recorded monophonically. That made it possible to put nearly twice as much music as normal on each disc by recording a different hour of music on each stereo channel. Thanks to CD's superb interchannel separation, neither mono track interferes with the other.

A special adaptor, packaged with the album, has switching that can be used to send a CD player's left or right output to both inputs of the listener's sound system. The adaptor, made by Sceniconcepts of France, can be switched back to normal stereo for use with conventional CDs.

The track numbering, as you might suspect, looks rather odd. For example, the first disc ("Das Rheingold," complete) starts in the left channel, with tracks 1, 3, 5, and 6, and runs up to tracks 34, 36, and 38. The opera then continues in the right channel, beginning with tracks 2, 4, 7, and 8, and ends with tracks 33, 35, and 37. Calling up one channel's track numbers while listening to the other channel just lands you in the middle of an aria or scene.

The album (released by Harmonia Mundi, RPC 32503.9) stars, among others, Wolfgang Windgassen, Hans Hotter, Astrid Varnay, and Regina Resnik, and is conducted by Clemens Krauss. Also available in this dual-track mono format is Beethoven's "Fidelio," on a single CD that plays for two hours and 24 minutes (RPC 32494). This, too, is a 1953 production, starring Martha Modl, Sena Jurinac, Wolfgang Windgassen, Rudolf Schock, and Otto Edelmann, with Wilhelm Furtwängler conducting the Vienna Philharmonic Orchestra and the Vienna State Opera Chorus.

Rodolphe and Harmonia Mundi are not the first to try dual-track mono as a way to double the playing time of CDs. Another European company, BIS, announced just such a Compact Disc in 1986. They were thwarted, however, when Polygram refused to manufacture discs which did not fully follow the official CD specifications.

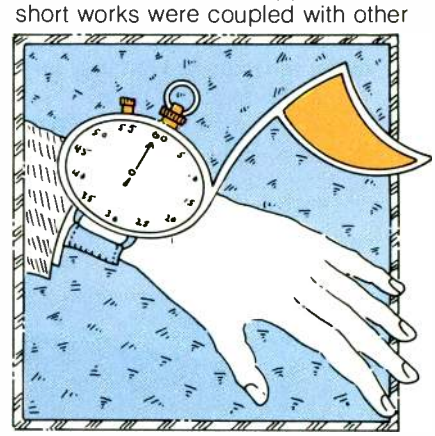
But shucks, we ain't seen nothin' yet. Sanyo has released specifications for a background music (BGM) system that puts *eight* hours of music on a disc, using the CD-I format. These, too, are monophonic, but Sanyo still had to cut some corners to cram all that music in: For one thing, distortion is a whopping (by CD standards) 0.5% at 1 kHz, and S/N is only 70 dB. I bet the sampling rate is less than a normal CD's 44.1 kHz, which would cut high-frequency response a bit, too. For background music, however, that's plenty good enough. Sanyo's BGM discs won't be compatible with normal CD players, but the BGM machines will have switching circuitry that will allow them to play regular CDs.

Time on Our Hands

The LP record was designed to be long enough to hold most common symphonies. The CD was designed around the length of an uncommon symphony, Beethoven's Ninth (the longest symphony most listeners own). For anything shorter than the Ninth, CD poses a problem: Duplicating the contents of the usual LP leaves blank nearly half an hour's worth of disc space—but if you wish to do more than just duplicate an LP, what do you fill out the CD with?

Filling out a disc was less of a problem in the LP's early days, not just because LPs are shorter than CDs, but because there were then two sizes, 10- and 12-inch. A long symphony, like Brahms' First, would fit onto the two sides of a 12-inch disc, while a shorter symphony, like Beethoven's Second, would fill either one side of a 12-inch album or both sides of a 10-inch disc. The smaller size was also ideal for pop groups.

When 10-inchers disappeared, the short works were coupled with other



works to fill a 12-inch disc. To simply put 10 inches' worth of music on a 12-inch record would have either meant breaking a work near the middle when there was no technical necessity, to spread it over two sides, or leaving one side of the record blank; either way, customers would have complained.

In fact, they complained anyway. Pop listeners grumbled about albums padded with fluff to fill out the larger disc—and about unpadded albums that seemed stingily short. And some classical music lovers complained that they could no longer simply buy

Illustration: Teresa Anderko

The Onkyo TX-850
Technology with Imagination.

ONE LESS BARRIER BETWEEN YOU AND YOUR MUSIC—

Most high fidelity systems are built around a receiver. After all, convenience is attractive. But convenience often has a price. And the price is usually performance.

That isn't the case with Onkyo. And a look at the TX-850 will show you just how seriously we value good sound.

Start with the amplifier. And Onkyo's Low Impedance Drive. At 68 watts per channel RMS,* the TX-850 provides more than enough power for realistic levels even with low efficiency speakers. Power into more demanding 4 ohm loads is an impressive 85 watts per channel. And for those occasions when digital sources demand instantaneous response to high level musical peaks, the TX-850 is capable of producing up to 160 watts per channel, even into 2 ohm loads!

The tuner section features Onkyo's famous APR (Automatic Precision Reception) system which continuously monitors the signal at the antenna and adjusts four critical circuits to assure you the best FM reception.

The TX-850 also gives you extensive signal processing capability. A continuously variable Dynamic Bass Expander gives you precise control of musical "punch" Onkyo's Selective Tone Control provides accurate tonal balance at any listening level. A Stereo Image Expander and Simulated Stereo circuitry extend the sense of spaciousness from any source you choose.

And a CD Direct selector allows you to bypass less crucial preamplifier circuitry so you can fully enjoy the clarity of digital.

Extensive video capability complements the audio performance. Remote control using Onkyo's new RI (Remote Interactive) system is standard, too. And the programmable remote transmitter means that you need just one control for all your components!

In short, the Onkyo TX-850 proves that you don't need to sacrifice sound quality for convenience. And stands as one less barrier between you and your music.

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*Both channels driven into 8 ohms, 20Hz-20kHz, 0.04% THD

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Digital audio tape can be cut to performance length, saving on production time and royalties. Shorter DATs could actually cost less.

the Budapest Quartet's recording of Debussy's string quartet and the Fine Arts Quartet's recording of Ravel's; since the two works were almost invariably coupled on a 12-inch disc, critical listeners now had to buy two albums containing both works to get the performances they wanted.

Couplings that cram a 45-minute LP don't fill a 74-minute CD, nor do they seem good value at the CD's higher price. On the classical side, the problem is now to find not two but three works which fit well together. Broadway shows and opera highlights are less of a problem—often, songs that were reluctantly sacrificed to meet the LP version's time limitations can be restored for CD. Pop groups usually don't have another half an LP's worth of material with which to fill out a CD, but pop reissues can include two short albums on one disc or add songs not on the original LP release.

The arrival of DAT, which can hold two hours of music, needn't make the problem worse. Tape, unlike discs, can be cut to length, saving a few cents on raw materials. Shorter recordings also require less duplication time and cut the royalties due composers and performers. So we may see differences in price among various DATs.

There will still be recordings which hold too much music or which offer music we just don't want to hear at a given time. Luckily, the two longest-playing media have come up with a solution to this problem: Both CD players and DAT decks can be programmed to play only what you want to hear.

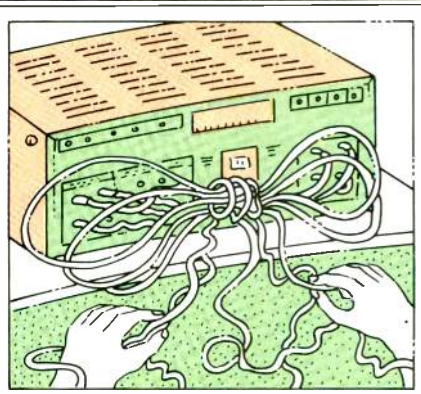
Favorite Tsar Selection

Players which can memorize your favorite programming for each disc (such as players using Philips' Favorite Track Selection or Sony players with Custom File) were probably designed with pop music listeners in mind. But if I had a player so equipped, I'd have more off-the-wall applications for it.

One such application would be job related. I periodically use and reuse portions of specific CD cuts for listening evaluations and to make test tapes for car stereo listening. Since I have to reprogram my player each time I change discs, this takes a while; FTS or Custom File would speed the process notably.

Another application would be undoing Rimsky-Korsakov's mistake. My favorite recording of Mussorgsky's *Boris Godounov* is on Angel, with Christoff. It uses Rimsky-Korsakov's reorchestration, which includes the rearrangement of the opera's last two scenes. In the opera's original ending, the Fool poignantly wails about Russia's fate. Rimsky, however, moved the death of Boris to the very end to make a socko finish.

Someday, when I break down and replace my well-worn LP with the CD reissue, I'll be able to reprogram those two scenes back in their proper order. But how nice it would be if my player could remember and do it for me every time!



Looping to Silence

A friend asked me how to wire up his new stereo system, and I dutifully diagrammed it for him. Then he decided to ignore my diagram and play around with the connections on his own.

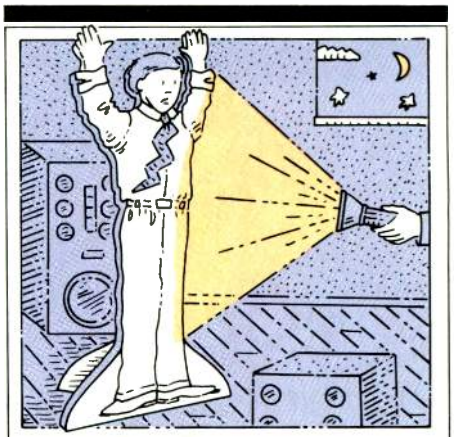
Alas, his system had a tape loop. He wired the tape output to an AUX input, which set up a positive feedback loop; when he switched to that input, there was a loud howl, then silence. Luckily, just his amplifier's output fuse blew, not his output transistors or his speakers.

And It Comes Out Here

Edward Tatnall Canby's April column on treating music with respect reminded me of a lesson I learned at WYBC, my college radio station. The first time I watched a broadcast from the control room, I noticed the engineer's hand hovering over the start lever of a tape deck about 3 minutes before the show was due to end. A few seconds later, after glancing at the clock, he started the tape rolling—but no music came over the monitor.

"What's that for?" I asked him.

"Simple," he explained. "We always start the theme music 2 minutes and 57 seconds before the show ends, because that's how long the music lasts. Then, we can fade the music in when the announcer finishes, and be sure the music will stop just when the show's time slot is over. It doesn't bother people to fade into the middle of the music, but it sure bothers them if we fade or cut out before it ends!"



The Perils of Polk

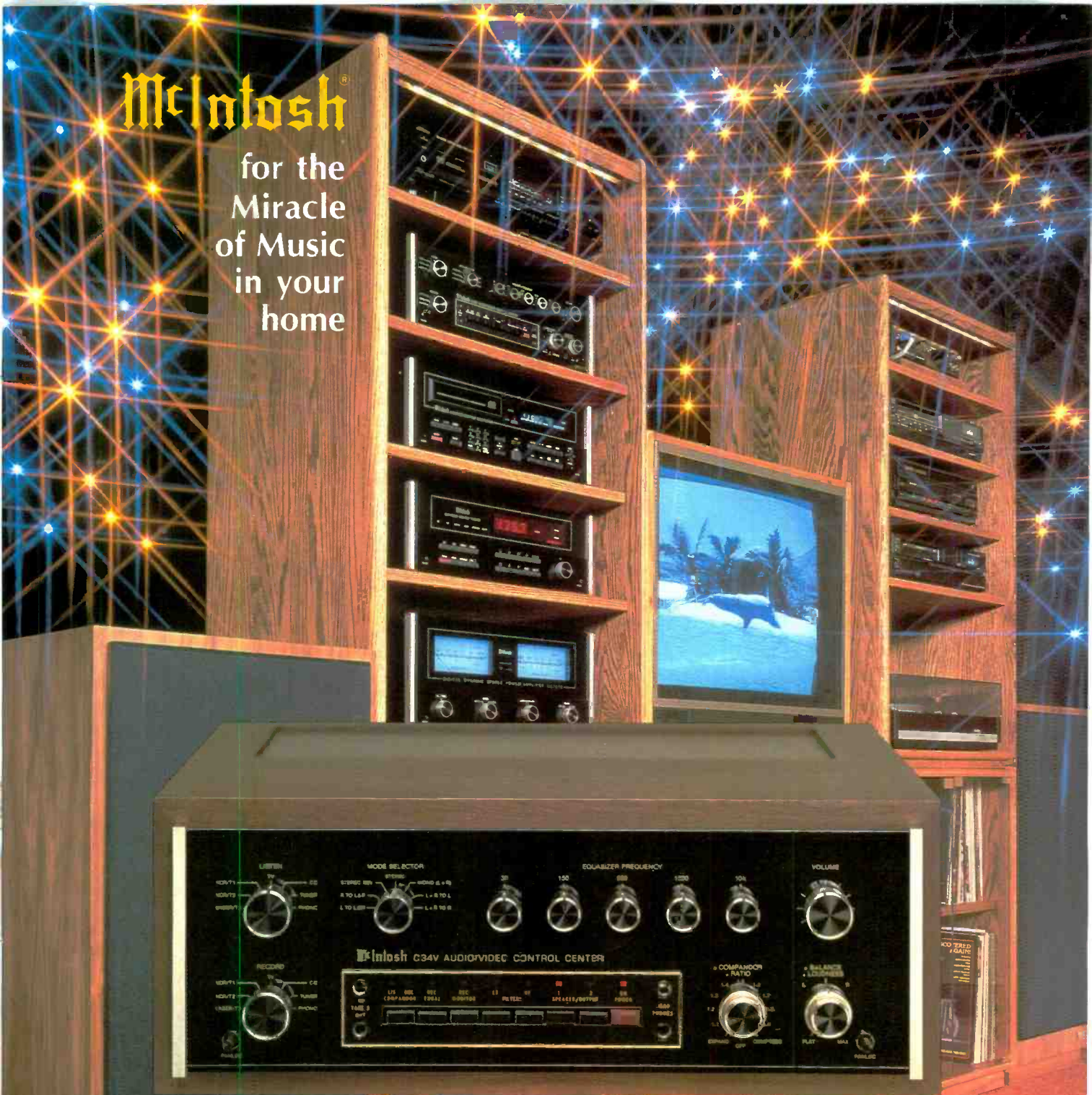
The audio press took no notice when a policeman in Wisconsin momentarily mistook Matthew Polk for a burglar, one night last year. Neither did Matthew, who was safely home in Maryland at the time. The policeman, responding to an alarm from Sound World, a Wausau hi-fi shop, soon realized that the figure standing nonchalantly by a loudspeaker was only a lifesize cutout of Mr. Polk.

Although that cutout escaped arrest and injury, another one, at a dealer in Detroit, was not so lucky: It was injured when a car swerved out of control and drove into the shop's window.

Illustrations: Teresa Anderko

McIntosh®

for the Miracle of Music in your home



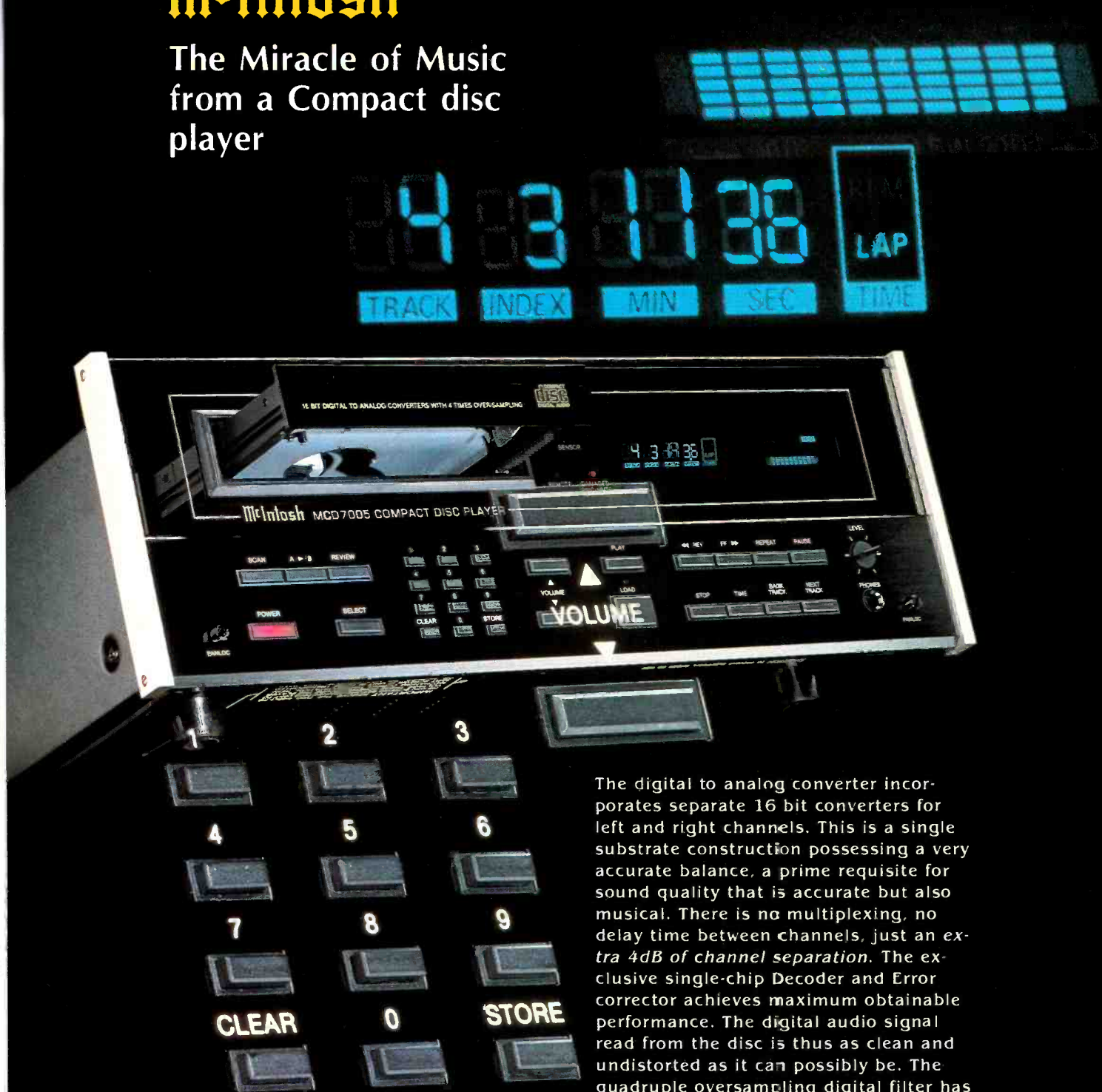
The McIntosh C34V Audio/Video Control Center is the distillation of more than 30 years of engineering progress in performance and versatility. Some of its features are:

- The most flexible, complete, stereo preamplifier
- The most flexible, complete, separate stereo recording preamplifier
- The most flexible, complete, program compressor and expander that can operate in either the listen or record preamplifier
- High quality, high performance distortion-free five band tone shaping controls that can be used in either the listen or record preamplifier
- High quality, high performance monitor power amplifier that protects your speakers and your music with the exclusive McIntosh Power Guard and Sentry Monitor Circuits

The McIntosh C34V Audio/Video Control Center, above all others, will deliver to you the best sound, the highest degree of versatility with the greates ease of use.

McIntosh

The Miracle of Music from a Compact disc player



The McIntosh MCD7005 establishes a new musical quality standard for sound from a compact disc. This second generation player continues the world wide McIntosh reputation for technological advancement as every advanced aspect of performance has been improved, from laser pen through the analog output. The quality of the sound and the measured performance has no equal.

The digital to analog converter incorporates separate 16 bit converters for left and right channels. This is a single substrate construction possessing a very accurate balance, a prime requisite for sound quality that is accurate but also musical. There is no multiplexing, no delay time between channels, just an *extra 4dB of channel separation*. The exclusive single-chip Decoder and Error corrector achieves maximum obtainable performance. The digital audio signal read from the disc is thus as clean and undistorted as it can possibly be. The quadruple oversampling digital filter has enhanced soft muting ensuring that there are no clicks or pops. It smoothly silences any readout interruption too large for the error correction circuits assuring extra sound integrity. Even in the face of disc defects or dirt that would interrupt play in the majority of players, the sound of the McIntosh MCD7005 Compact Disc player sets superlative standards of musical purity.

McIntosh

The Miracle of Music from a Power Amplifier

The McIntosh MC2500 power amplifier. . . promised performance delivered.

What is considered to be "State of the Art" has been the starting line for McIntosh research. research that responds to the demands for quality performance improvements. In the MC2500 the quality of performance is clean, distortion free music from 500 watts of pure power per channel. And, in these days of spectacular musical demands of the compact disc, should the dynamics of the music require greater power, McIntosh POWER GUARD* protects your music from the harsh sound of clipping. (1) dynamically prevents overdrive into hard clipping - (2) assures maximum output without increased distortion -(3) protects your speakers from excessive heating. The McIntosh MC2500, truely, is "Technology at the cutting edge."

*US Patent #4048573

The Miracle of Music from Loudspeakers

The McIntosh XRT22 Uniform Field Loudspeaker System is the latest technological achievement toward the goal of perfect sound reproduction. There are two dramatic subjective listening characteristics: first, when listening you become emotionally aware of the addition of depth perception to the ordinary stereo spatial effects, and second, the definition of individual collective musical sounds is improved to the point where it is really difficult to hear differences between the real and the reproduced sound. This performance is achieved with wide dispersion controlled frequency response and a time coordinated sound field. The high frequency radiators are mounted in a straight line, all in the same plane. In an 8 ft. high room they effectively radiate from floor to ceiling. In this mechanical arrangement the radiated sound field is a half cylinder, and the energy content of the sound field decreases only directly with distance. Instead of

McIntosh®

with distance squared. For a given sound pressure level across the room the XRT22 requires less electrical input than conventional speakers and hence produces lower intermodulation distortion. The improved definition of musical sounds is simply a revelation that you have to experience.

To match the magnificence of the tweeter performance required the design and development of low and mid frequency radiators that would achieve extremely low distortion and time coordination.

These design objectives were met through the adjustment of a combination of radiator and crossover network design variables, enhanced by a unique computer program developed by the McIntosh staff of loudspeaker scientists. The subjective evaluation of the XRT22 system immediately revealed a relationship to the reality of music and the presence of depth perception to a degree that is very close to perfection.

XRT22 Available in Oak, Walnut or Satin Black. Bass Cabinet: Select veneer protected by a multicoat, satin lacquer finish covering 3/4" (1.9 cm) high density particle board with internal bracing, airtight assembly. Tweeter Column Array: Machined from solid Walnut or Oak, protected by a multicoat, satin lacquer finish. CS22 Tweeter Stand (accessory): Mouldings machined of select solid Oak or Walnut.

McIntosh®

The Miracle of Music and the Golden Touch of Remote Control

The McIntosh infrared Remote Control System provides unusual versatility with operating simplicity. It is a system which provides remote control in one listening area yet can be expanded to provide individual source selection with independent volume settings in up to five additional areas. In each of these areas, when connected to a McIntosh tuner designed to connect to the infrared remote control system, and a McIntosh compact disc player you can in any area:

1) turn the AC power on or off;
2) select the listening sound source for the local area while other areas choose their listening source independently;
3) adjust the volume in the local area and not affect the volume in other areas;
4) in tuner, select the stations you wish to hear on either AM or FM;
5) in compact disc, put the CD player in the play mode, shift to the next track or the preceding track, or stop the play from the disc; or
6) select the preamplifier as a program source with all of its connected sources.

The McIntosh Remote Control System ties together in a simple control system the McIntosh Miracle of Music in your home.

For information on McIntosh products please send your name, address and phone number to:

McIntosh Laboratory Inc.
Department 911A8
PO Box 96 East Side Station
Binghamton, NY 13904-0096

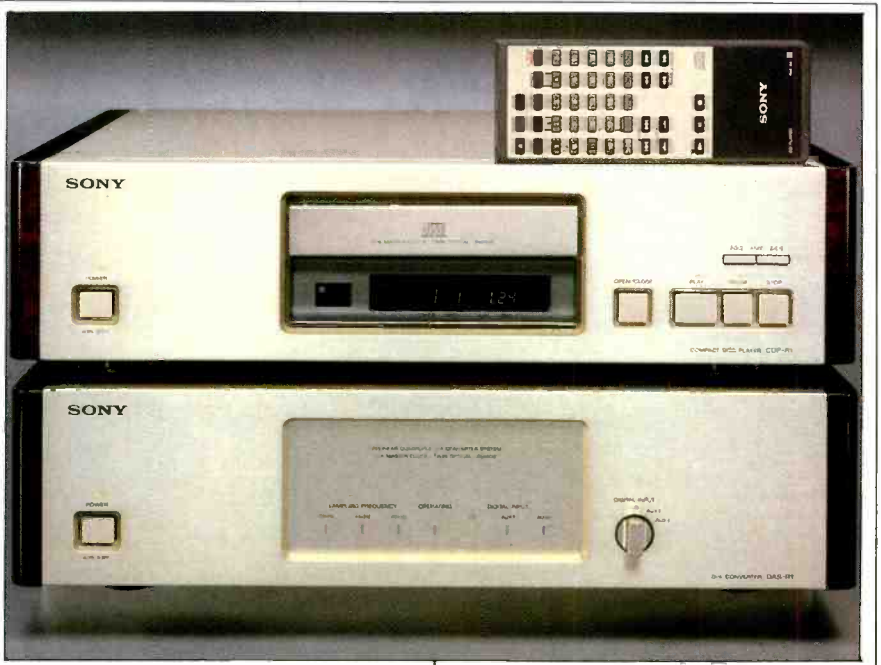
BERT WHYTE

REFERENCE WORKS

In the opinion of many industry people, the 1988 Summer Consumer Electronics Show in Chicago was a "downer." While the EIA claimed an attendance of around 96,000, veteran observers thought 70,000 was a more realistic figure. This lowered attendance was generally attributed to such things as the ongoing unfavorable dollar/yen situation, the continuing uncertainty over introduction of R-DAT, and the plight of the high-end audio manufacturers, who were forced into cramped 13- by 14-foot rooms in the already overtaxed McCormick Center Hotel. As a consequence, many told their dealers they would not be demonstrating their equipment, and obviously quite a few dealers decided to skip the Show. As always, in spite of all these exasperating situations, there were a number of new products that piqued my interest.

We can dispense with the R-DAT issue very quickly. In spite of the NBS rejection of Copy-Code, Japanese suppliers did not stampede to ship R-DAT machines to the U.S. You might say the RIAA and the record industry are now fighting a rear-guard action. With such schemes as Solo Plus, which envisions one legal DAT copy of a CD, or a possible try in Congress for a royalty on DAT hardware and blank tapes, the last-ditch stand may be the RIAA avowal to sue any company that tries to import R-DAT machines into the U.S. The EIA has countered with a large legal defense fund. Teac says they will challenge this RIAA threat by bringing into the U.S. five ultra-high-end $6,000 R-DAT recorders, boasting all sorts of refinements, including the use of all-discrete circuitry in the analog stages. Suffice to say, there have been earlier announcements about R-DAT import, and I am among those who are still waiting.

In the meanwhile, R-DAT blank tapes are now available from virtually all major tape suppliers. Capriccio, that enterprising company which marketed a line of classical prerecorded R-DATs in the U.S., was at the SCES, as was GRP, which offers seven pop music DATs. Both report good sales. Tom Jung, who issued his first R-DAT tape of some of his dmp titles, says he sells "several hundred per week." By this fall, he expects to have about 12 titles on the R-DAT format. Surprisingly, according to these DAT prerecorded tape producers, there is a "gray market" base of R-DAT machines in the U.S. estimated to be as high as 12,000 units!



In the meanwhile, the CD bandwagon rolls on, quite aloof from all this R-DAT ferment. Up to the time of the SCES, Sony's most advanced CD player was their flagship, the $1,800 CDP-707. At the Show, Sony surprised everyone by getting into the high-end CD-player market with the $8,000 CDP-R1/DAS-R1. As you might expect, this player is the distillation and embodiment of Sony's most advanced Compact Disc research. I could fill 20 pages describing all the new technology in this super player. Sony has painstakingly addressed every mechanical, electronic and optical parameter that has an influence on the reproduction of sound from a Compact Disc. The CDP-R1 transport is connected to the separate DAS-R1 D/A converter by special twin fiber-optic cables. A special master-clock circuit in the DAS-R1 uses a quartz-crystal oscillator so precise it limits measurable jitter, or time-base error, to an infinitesimal 0.1 nanosecond. That's one 10-billionth of a second! Sony claims this is a sevenfold reduction in time-delay distortion, as compared to any other existing player. Sony also has taken extreme measures in the suppression or elimination of resonances in this player; even the capacitors are mounted with anti-resonant damping material! Perhaps needless to say, this CD player uses 18-bit linear quantization and 8-times oversampling. As noted, the transport and D/A converter are totally separate, and each has facilities which allow it to be used with other types of transports or converters. This elaborate Sony Compact Disc player is expected to be available in the fall.

Also for the affluent audiophile, Spectral offered an advanced ultra-high-end CD player. In development for three years, the SDR-1000 player has a very striking high-tech appearance that's in line with the Spectral tradition. The transport is extremely rugged and is suitable for broadcast use. Combining metal castings with laminated mechanical elements for damping, the transport uses a very fast-acting adaptive servo for accurate tracking. The player uses modular card-cage construction for ease of servicing and updating. The transport and integrated line-level preamp are mounted in a single, very rigid, 19-inch rack-mountable chassis. Four D/A converters are used in a push-pull balanced configuration. Both 16-bit quan-

SDA SRS 2.3
$1099.95 ea.

The Polk Revolution Continues!

"Polk reinvents the loudspeaker"

High Fidelity Magazine

Nearly six years ago the audio world was stunned by Matthew Polk's introduction of revolutionary SDA technology. While other designers had been concentrating on small refinements to existing loudspeaker technology, Matthew Polk opened the door to new frontiers of exciting realism in sound.

True Stereo SDA technology maintains stereo separation all the way to your ears, something which no conventional speaker can achieve. Conventional speakers make it sound like the musicians are trapped in the speaker boxes or in the small space between them. Polk's patented SDA speakers fill the entire width of your listening room with sonic images so breathtakingly real that its just like having the musicians in the room with you. They must be experienced to be believed!

Matthew Polk's award winning SDA SRS 1 2 and the SDA SRS 2.3.

Introducing the SDA SRS 2.3

Introduced two years ago, the flagship SDA Signature Reference System (SDA SRS) is the ultimate expression of loudspeaker technology. A two-time winner of the prestigious Audio Video Grand Prix Award, the SDA SRS was recently chosen by the editors of Stereo Review magazine for their ultimate dream system.

Now being introduced, the SDA SRS 2.3 offers all of the benefits of third generation SDA technology in a slightly more modest package. It is the perfect speaker for those listeners who demand the best and most exciting listening experience but who cannot accommodate the larger SDA SRS.

Words can never fully express the thrilling experience of listening to the new SDA SRS 2.3. Effortless reproduction at live concert levels, distortion free, body-tingling bass and room-filling stereo imaging are executed so flawlessly that when you close your eyes you'll forget that you are listening to speakers at all: Visit your local Polk dealer and experience them for yourself.

polk audio

The Speaker Specialists ®

5601 Metro Drive, Baltimore, Md. 21215

Where to buy Polk Speakers? For your nearest dealer, see page 30

Sony claims that a circuit in their new CD player gives it a sevenfold cut in time-delay distortion over any other player.

tization and quadruple oversampling are augmented by selectable special filters developed by designer Keith Johnson. These include time-correction, resolution-enhancement, and distortion-correction (smoothing, deglitching) filters. Premium parts are used throughout the player, and include such refinements as printed circuit boards by Tektronix and opto-isolators and displays from Hewlett-Packard. (Space does not permit outlining the many other features of this upscale CD player, priced at $5,795.)

At the SCES, it was obvious that CD changers are now a mainstream product. Various suppliers are offering multiplay units with capacities of five, six, and up to 10 discs, with the ability to access any track in any sequence on any of the Compact Discs. (Prices range from $349 to $850.) The 18-bit quantization is increasingly available, priced as low as $699, with such companies as Technics and Yamaha joining quite a few others in offering 8-times oversampling.

The other CD-related item at the SCES was the debut of the Medea Ltd. digital processor I mentioned in the June 1988 issue of *Audio*. It now turns out that the device is called the Wadia 2000 Decoding Computer, and is a product of the Wadia Digital Corporation, a division of Medea Ltd. in Minneapolis. This Wadia processor consists of a highly regulated, separate power supply which feeds the separate DigiLink that converts the 75-ohm digital coaxial output of a CD player or R-DAT to optical. The DigiLink has three inputs: 32 kHz for satellite transmissions, 44.1 kHz for CD, and 48 kHz for R-DAT. The system's third section is the processor/computer. The Wadia 2000 operates with 64-times interpolation (oversampling) but does a great deal more digital processing, as well. Wadia shared a room with W & W Audio, the importers of the Duntech loudspeakers, and apparently W & W will be handling the Wadia unit at a cost of $6,500.

The Wadia 2000 fed a Classé Audio DR-7 preamplifier, which in turn was connected to four Classé Audio DR-3-VHC stereo amplifiers. Each amplifier was operated in bridge mode, and two amplifiers per side were used to biamplify the new Duntech Marquis loudspeakers. Into the 4-ohm impedance of the speaker, the Classé Audio amplifiers provided 600 watts of Class-A power per channel. I had no previous experience with these Classé Audio amplifiers, but I found them quite impressive, especially for their highly detailed, yet very smooth and musical, top end. The Marquis loudspeaker is, in essence, a mini-Sovereign, employing the same columnar, symmetrical design and point-source imaging. It is certainly more adaptable to smaller rooms than the Sovereign and, at $5,150, considerably more affordable.

This particular exhibit room had been acoustically treated with Peter D'Antonio's RPG (Reflection Phase Grating) Abffusors and Diffusors, which were adjusted by means of TDS measurements. The same was true of Spectral's much larger room on the lower level of McCormick North, where Spectral was using two of their new 200-watt Class-A amplifiers to bi-amplify Duntech Sovereign speakers. By now, most exhibitors are well aware of the generally poor acoustics of the rooms they are assigned in venues like McCormick Place or in hotels used by AES conventions and consumer audio shows. Since the advent of the RPG system, more and more manufacturers are opting to create these "synergistic" rooms. D'Antonio says that while there are dedicated audiophiles who do set up RPG rooms, he admits the expense deters others. He told me about his new Concert Hall in a Carton, consisting of several Abffusor and Diffussor modules. These are only four inches deep and are meant to be mounted on walls and ceilings with Molly bolts. Using this do-it-yourself approach, you can acoustically treat an average listening room of from 2,200 to 3,000 cubic feet. D'Antonio will provide detailed instructions for the proper setup of his modules, without recourse to TDS analysis. These consumer modules are not quite as efficient as the standard elements, but will provide better than 80% effectiveness. The RPG Concert Hall in a Carton is expected to retail through high-end dealers at a cost of $1,200.

Among legions of loudspeakers, there were a few that deserved a considerate and attentive audition. As always, you can be sure of a well-con-

For an IBM 5¼" computer diskette containing the complete catalog of CBS Compact Discs, send $2 for postage and handling to: CBSCD, Box 257, Garwood, NJ 07027 "CBS" is a trademark of CBS Inc. © 1988 CBS Records Inc.

Telarc will soon release their first prerecorded cassettes, which will be made using a "tapeless" digital memory system.

ducted demonstration and some interesting music from Dick Shahinian, whose love of music is coupled with his encyclopedic knowledge of recordings. His impressive new Diapason system consists of an omnidirectional array of midrange and tweeter drivers, atop his Double Eagle subwoofers, crossing over at 140 Hz. The system was driven by Bedini amplifiers, and Dick played the magnificent London CD of Riccardo Chailly conducting the Cleveland Orchestra in a stunning performance of Stravinsky's *Rite of Spring*. The Diapason handles the great dynamic range of this recording with ease, and the sound is convincingly natural. The 31 Hz of the 48-inch bass drum used freely in this work is reproduced cleanly and with a wavefront that is visceral and palpable! The complete Diapason system sells for $5,700.

Martin-Logan was demonstrating their new Statement loudspeaker at a Near-North art gallery. This is their magnum opus, what with seven-foot-high woofer towers, each with four 12-inch drivers and 800-watt internal amps. Crossing over at 80 Hz to 3- by 6-foot electrostatic panels for which they claim the astonishing efficiency of 96-dB SPL for one watt input at one meter. The pedestal of these panels contains the quite massive transformers, and a special electronic crossover is supplied. A −3 dB point of 16 Hz is claimed with a top of 22 kHz. Such an assemblage is expensive, and at $40,000, it is obviously in a very rarefied price stratum.

Rowland Research, heretofore known for their excellent preamps and power amps, has bravely forayed into the high-end loudspeaker sweepstakes. Their Avalon Acoustics division introduced the $12,000 Ascent loudspeaker. Its enclosure is of unusual design and angled on four frontal planes. The front panel is a massive six inches thick, and in it are mounted a titanium dome tweeter, a dome midrange, and a 12-inch woofer with a Nomex/Kevlar cone. Unusually, the proprietary crossover is mounted in a separate enclosure. The speaker system has a rated SPL of 90 dB for one watt input at one meter, and the heavy construction accounts for the 160-pound weight of each unit. Frequency response is claimed to be ±2 dB from 36 Hz to 24 kHz.

For some years now, prerecorded cassettes have outsold vinyl discs, and the Compact Cassette must presently be considered a very mature technology. Even inexpensive cassette decks have remarkably good performance. Telarc will soon release their first prerecorded cassettes of their popular Cincinnati Pops recordings. They decided to enter this market because of a remarkable new high-quality duplicating process developed by American Multimedia of Burlington, North Carolina. As you probably know, most prerecorded cassettes are duplicated at high speed, with a 64-times running speed quite common. A half-inch tape dubbing master, running in an endless-loop bin, feeds multiple slave recorders. With a new dubbing master, the sonic quality of the duplicates is quite good. Unfortunately, after thousands of passes, the dubbing master deteriorates, and the sound quality of the prerecorded cassettes is considerably degraded.

American Multimedia has developed their Digital Audio Analog Duplication process, in which a master digital tape is fed into their proprietary memory storage system, with a capacity of one gigabyte! This "tapeless" 16-bit digital master is passed through a special ultra-high-speed D/A converter, and thence to the recording slaves, which operate at 80-times running speed. Via this process, the cassettes are duplicated on TDK SA tape, with the cassette's A and B sides copied simultaneously. The memory is capable of storing 50 minutes of program, more than enough for a C-90 cassette. The recording slaves are always being fed with the equivalent of a brand-new digital tape master, so the sonic quality of the prerecorded cassettes is consistently high. Richard Clark, president of American Multimedia, told me that in tests he made using metal-particle tape with Dolby C NR, expert listeners were unable to distinguish between the prerecorded cassette and a Compact Disc of the same program. Tom Jung will also be using this Digital Audio Analog Duplication process to market audio cassettes of his dmp recordings and, reportedly, Sheffield will market DAAD cassettes, too.

AUDIO CASSETTE.
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LASER OPTICAL VIDEODISC.
FIRST.

COMPACT DISC.
FIRST.

AMERICA.
AT LAST.

PHILIPS.
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Americans are generally more aware
of our inventions than they are of our name.
Yet those "Firsts"–
from the ubiquitous audio cassette to the flawless sound
of the compact disc player–
are just a few of the breakthroughs Philips is known for.
Philips of the Netherlands
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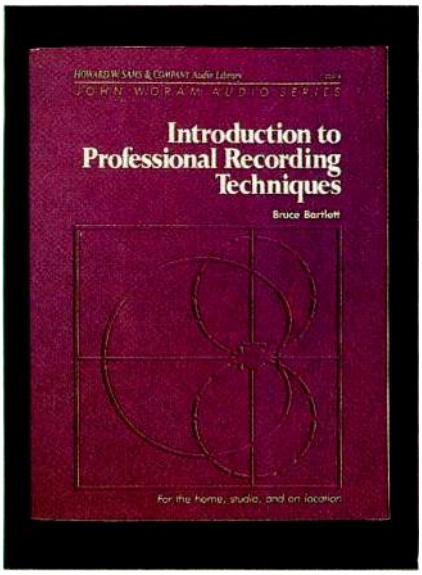
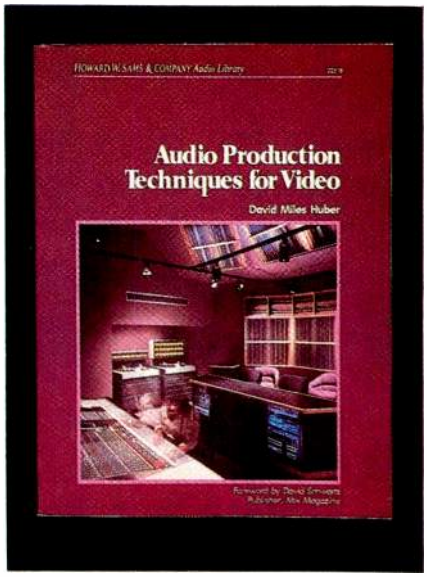




Introduction to Professional Recording Techniques by Bruce Bartlett. Howard W. Sams & Co., 400 pp., paperback, $22.95.

Audio Production Techniques for Video by David Miles Huber. Howard W. Sams & Co., 368 pp., paperback, $29.95.

These new softcover books will be of interest to the more technically minded readers of *Audio*. Both are primarily aimed at the young professional-to-be who is just starting out in a career in audio or video recording. They cover a good bit of the same material, as would be expected, but from different perspectives which are equally valid and useful.

Bartlett's main focus is on the home studio, the site of that ever-growing segment of the industry once called "semi-pro" but now capable of really fine work. He methodically describes the agonies of room selection and acoustical treatment and then looks at consoles, monitoring, and electrical interface. Then come detailed chapters covering microphone selection and basic microphone techniques. Tape recorders are covered in some detail, as are noise reduction and various types of signal processing such as compression, limiting, noise gating, and reverberation.

Basic session protocol is covered, as are specific hints for recording the spoken word and recording on location. There is a useful introduction to MIDI (musical instrument digital interface) techniques, which are destined to become even more important than they currently are in today's professional studios.

Bartlett writes in a very lucid style, and his explanations are clear and to the point. Overall, I find his discussion of microphone principles and applications to be first rate—not surprising, since this field is a specialty of his.

As for Huber, he gets right to the heart of audio for video, focusing on the tape recorder (both audio and video) and principles of synchronization. Tape recorders are described in more detail in the Huber book than in the Bartlett, and digital audio recording is given more than passing coverage. This is as it should be, inasmuch as the same equipment is often used for both video and digital audio purposes. Coverage of synchronization, time codes, and basic in-studio operations using these techniques is quite thorough.

Huber's discussion of audio techniques for video concentrates on those applications likely to be encountered in the field of video at large, such as news-gathering and on-location shoots. His subsequent description of recording equipment and techniques is pretty much shaped by this orientation. His succinct discussion of microphones covers transduction principles as well as basic applications, and his coverage of M-S stereo really points up the advantage of this technique for video post-production.

Huber's chapter on audio post-production zeroes in on the problems of overdubbing, dialog replacement, and addition of sound effects, all in the context of putting together a final audio/video product. Detailed line drawings show how all the elements go together. Basic video editing operations are also covered in good detail, and a glossary is included.

Neither the Bartlett nor the Huber work provides a detailed bibliography, but this is not necessarily a limitation in books which stress applications. Both are highly recommended to those whose technical interests include home recording. *John Eargle*

The Audio Dictionary by Glenn D. White. University of Washington Press, 302 pp.; hardback, $30; paperback, $14.95.

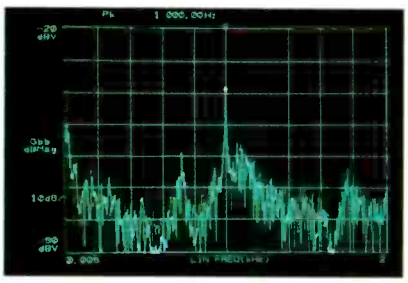
The dictionary is a very interesting and useful form of reference work, and I particularly recommend them to beginners at the audio game. A good one, like this present volume from Glenn White, Northwest District Manager for Brüel & Kjaer can do a great deal for one's insight into the game's strategy. My own formulation of the problem is as follows:

TE = H (System Q × N Software)/$ Spent

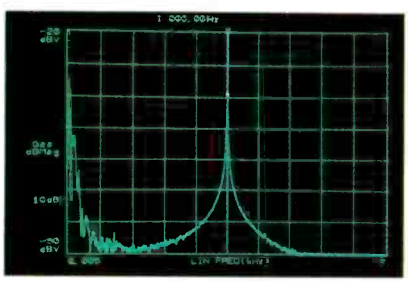
where TE is total enjoyment; System Q is system quality, which is nonlinearly related to one's self-assurance, the quality of one's magazine subscription list or library, and brand availability or town size; N is the number of records in linear feet, and $ Spent is self-evident. (H, of course, is number of hours spent, in fortnights.) A good hi-fi dictionary, then, will raise the System Q by recommending magazines such as this one, together with worthwhile books. This White does—to the point of gilding the Golden Ear by almost pointedly ignoring our competitors.

The earliest discussion of worth of dictionaries that I can remember having was with my fourth-grade teacher, Mrs. Munson, who thought poorly of my spelling. She also didn't think much of my response that it didn't matter how I spelled then because when I grew up, I was going to have a typewriter and it was going to spell for me.

THE IDEA BEHIND OUR NEW CASSETTE DESIGN IS NO GREAT SHAKES.



OLD XLII



NEW XLII

When it comes to audio performance, there's no such thing as good vibrations. To guard against unwanted resonance, we at Maxell have re-evaluated and virtually recreated every element in our new XLII cassette. From the special screening shield to the dual damping sheet to the extraordinarily durable cassette shell.

As a result, we've dramatically reduced modulation noise that causes distortion and blurred sound. Just how dramatically is evidenced by the graphs to the left, recorded when we tested our old and new cassettes with a digital spectrum analyzer.

During both recording and playback, our new cassette mechanism ensures maximum performance by keeping vibrations to an absolute minimum. In fact, the only thing we may have left shaken up is our competition.

maxell
The Tape That Delivers Higher Performance.

Enter No. 28 on Reader Service Card

The Audio Dictionary is full of good stuff about mikes and recordings, as well as straight-ahead stuff on home audio.

But she was right about my spelling. Indeed, I spelled so poorly that I couldn't find most of the words I tried to look up in the class dictionary, which is too often true today as well. (However, the Managing Editor's notion that I cannot spell more than half the words in my vocabulary and her consequent refusal to let me proofread is mere bad humor at the size of my vocabulary.) Anyway, you won't have such problems with this book, as even the worst speller will land within a page or two of where the proper spelling is printed.

When I was in college, I remember, my English literature professor was able to attract my fleeting span of attention for more than a few mS with a story about Dr. Samuel Johnson, one of the first really good dictionary-makers. The point of the story was that it is very difficult to define words without using circular definitions. The prof. made his point by reading out the Johnson listing for "net," which was "reticulation." Now, Dr. Johnson lived in the last part of the 16th century in England, and mid-20th century freshman lit. students (particularly those who can't spell) have to look up the definition of "reticulation," which the good Dr. Johnson gives as "net." White doesn't make this fairly elementary sort of mistake. Rather like most of the good current dictionary-makers, he peppers his definitions with words found elsewhere in the volume, and his typesetter (or—perish the thought—his editor) has called attention to the fact by the use of small capital letters.

Some of White's choices of words for definition betray a bias toward professional sound. For example, take "MOS," which I immediately identify as the first part of MOS-FET, an acronym for Metal-Oxide Semiconductor, Field-Effect Transistor. For White, it is just "mit out sound," coming from the slang used by early movie-makers for silent films. (Interestingly, MOS-FET is not in the American National Standard *IEEE Standard Dictionary of Electrical and Electronics Terms* or directly defined in my fifth edition of the Sams/ITT *Reference Data for Radio Engineers*.) While there is lots of good (i.e., non-obscure) stuff on microphones, motion-picture sound, and recordings, there is also plenty of straight-ahead stuff on home audio. "Fringing," for instance, is flanked by "Frequency Response" and "Front End." New areas of interest to both pro and home audio users have been considered as well. There is a half page on the digital-to-analog converter which concentrates on factors influencing accuracy, and there is an excellent discussion of EFM, eight-to-fourteen modulation, which is used to code data on Compact Discs.

Lest you think that a dictionary must be a deadly dull affair, let me finish with an anecdote borrowed from the entry on "Editing."

"No less an old master than Vladimir Horowitz has said that in any perfor-

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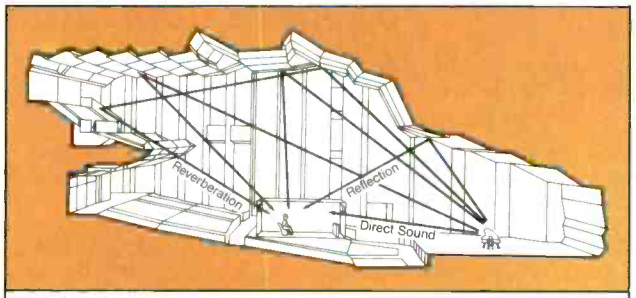

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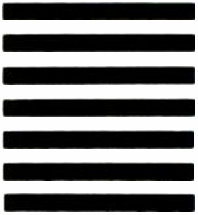

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Says Leonard Feldman in his Review in AUDIO Magazine, Vol. 71, No. 9
"In my view, you can spend two, three, even five times as much as what the Soundcraftsmen Pro-Power Four costs but you won't get a better, more reliable, or more musical-sounding power amplifier."

OUR PROFESSIONAL QUALITY separates offer you the most choices of the finest American quality components, to add to your present system, or to start a new system... Amplifiers from 100 watts per channel to an awesome 375 watts per channel... preamplifiers from "straight-wire" to "control-center," to "pre-amp EQ"...the very highest quality Equalizers... an unsurpassed Analyzer/EQ"... and the uncompromising new CD750 Compact Disc Player featured on the opposite page. Also a matching AM/FM Tuner with 16 station presets.

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REASON #7: Full-size 19" Rackmount panel with dark charcoal off-black finish, is a standard feature, as shown, with optional hard-wood side panels available.
REASON #8: Speaker System switching, 1, 2, or both...plus the High Current low impedance power to drive Multiple Speaker Hookups in addition to Systems 1 and 2.

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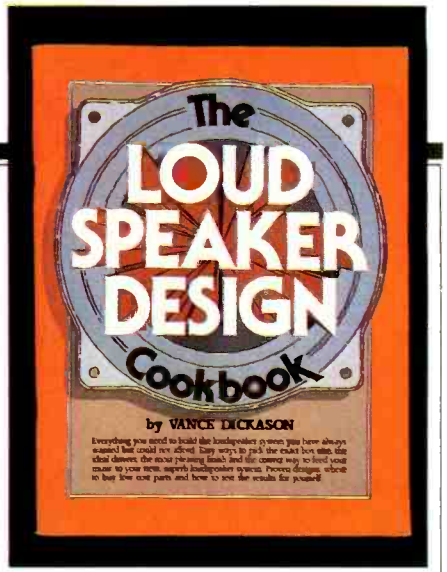
The Loudspeaker Design Cookbook is chock-full of recipes based on the Thiele-Small parameters of loudspeaker design.

mance he expects to miss several notes, explaining that to avoid this, he would have to play very carefully, without taking any chances, and that the music would thereby suffer."

The real worth of a dictionary is shown by how often it gets referred to, and I strongly suspect that the paperback version we have of White's work is going to have to be replaced by a hardbound version in short order. I might even buy a few copies of *The Audio Dictionary* for writers and other friends of the magazine, and that's about as strong a recommendation as I can give. *Eugene Pitts*



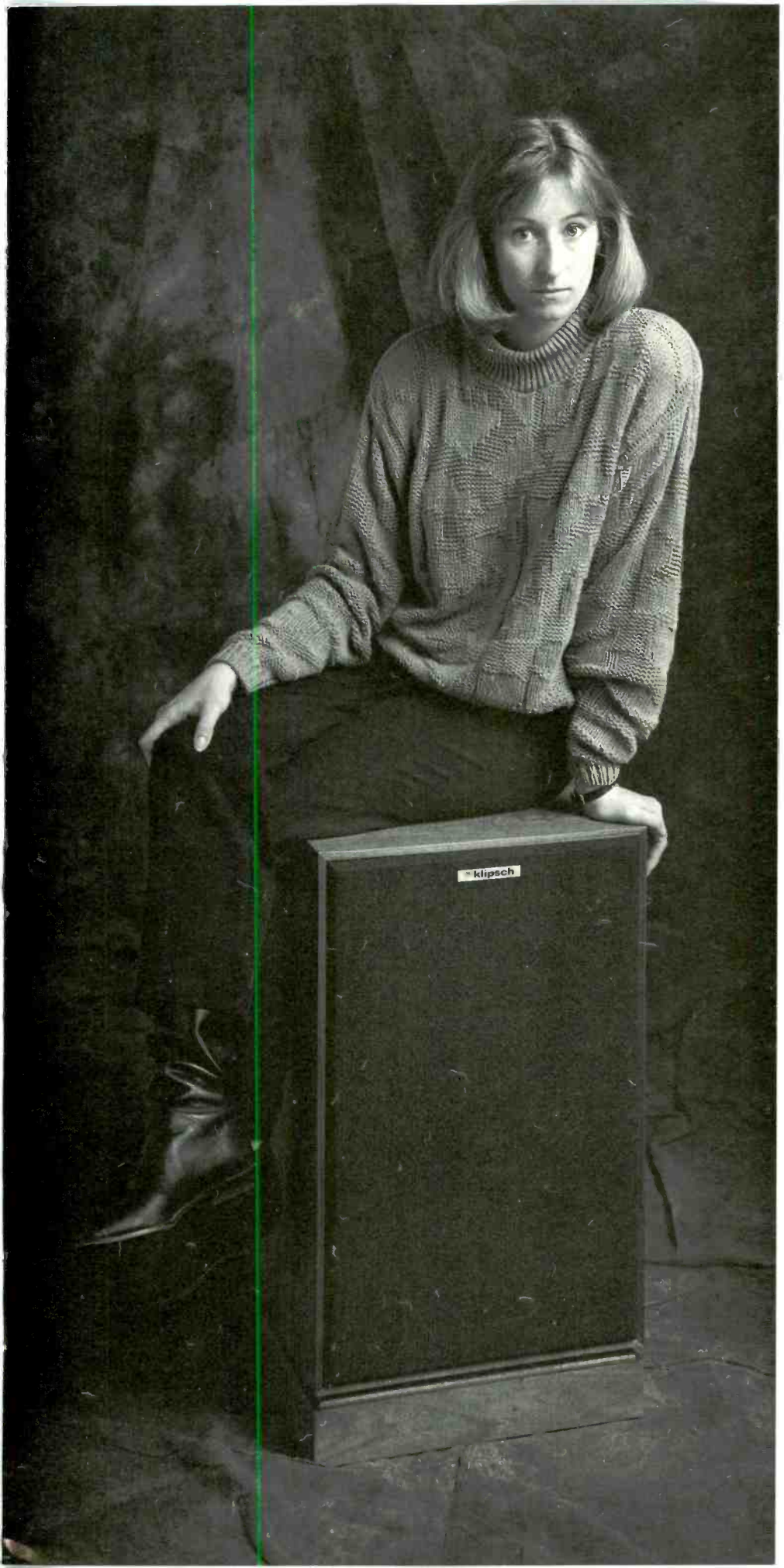
The Loudspeaker Design Cookbook, Third Edition by Vance Dickason. Marshall Jones Co., 96 pp., paperback, $19.95. (Available from Old Colony Sound Lab, Box 243, Peterborough, N.H. 03458.)

In the latest edition of this work, the author presents eight chapters chock-full of recipes based on the modern loudspeaker design theory of Thiele and Small. This is a "how to" book, not a "why" book, and thus is principally addressed to the serious enthusiast rather than the experienced designer. Nevertheless, the serious designer will find the book to be a convenient source of reference, thanks to the numerous charts, tables, and formulas it contains.

The author treats closed-box and vented-box low-frequency systems, passive-radiator and transmission-line low-frequency systems, cabinet construction, mid- and high-frequency drivers, passive crossovers, and small-signal loudspeaker measurements. Active crossovers are given only a few paragraphs, as the author feels this subject area is beyond the scope of the present work.

The book is well organized and contains a generous supply of references to original sources for those readers desiring to explore any of the topics to a greater depth. It is physically large—about the size of a magazine—and is well illustrated, with numerous diagrams and schematics that are clearly drawn.

The home builder of loudspeaker enclosures who remembers a little algebra and has some facility with a calculator will find this to be a very useful book, indeed. *Eugene T. Patronis, Jr.*



Old Records, New Life

I wanted a better cassette deck. So one Saturday I dropped by a hi-fi store. The salesman took me into one of the sound rooms for a demonstration. Racks of equipment were everywhere. He started to make a recording and I immediately fell in love with the music. It was so clean, so rich, so dynamic.

"What CD is that?" I asked.

He didn't hear me over the music but it didn't matter because I quickly saw that I wasn't listening to a CD at all. It was a record.

I made quick mental notes of the system I was hearing. I walked over to the wall of speakers and discovered that KLIPSCH® kg^{4}s® were playing. That was the first time I had truly heard *wide* dynamic range.

I didn't buy a cassette deck that day. I spent less money and bought a new pair of kg^{4}s. They've put new life in my old record collection. My CDs sound simply awesome. I never heard music so clearly.

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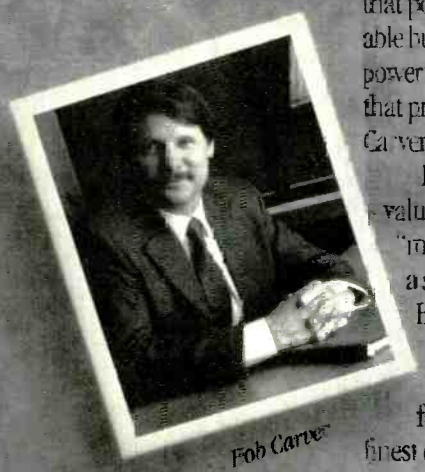
"Because I wanted to have the world's finest amplifier and the world's greatest transfer function, I built the astonishing Silver Seven."

The Silver Seven, finest power amplifier in the world. $8,750 each. Two required for stereo. Tube counters note: The 15th KT88/6550A is a voltage regulator.

Before you meet the new M-4.0r, Bob Carver wants you to meet its inspiration, the money-is-no-object Silver Seven.



Bob Carver

"One of my important design precepts is that power amplifiers should be easily affordable but last year, when I began designing a powerful new amplifier, I temporarily set aside that precept of affordability. The result is the Carver Silver Seven Mono Power Amplifier."

Destined to redefine ultra-high-end values forever, the Silver Seven is truly a "money-is-no-object" design. In fact, just a single pair of its fourteen KT88/6550A Beam Power output tubes cost more than some budget amplifiers.

The Silver Seven employs classic, fully balanced circuit topology and the finest components in existence.

A-450 Ultra Linear output transformers with oxygen-free primary leads and pure silver secondaries.

- *Wonder Cap capacitors throughout.*
- *Interconnects are Van den Hul Silver.*
- *Internal wiring is pure silver.*
- *Wonder Solder throughout.*
- *Gold input connectors and high current gold output connectors.*

The Silver Seven's polished granite anti-vibration base floats on four Simm's vibration dampers. The separate power supply's power transformer end-bells are machined from a solid block of high-density aluminum.

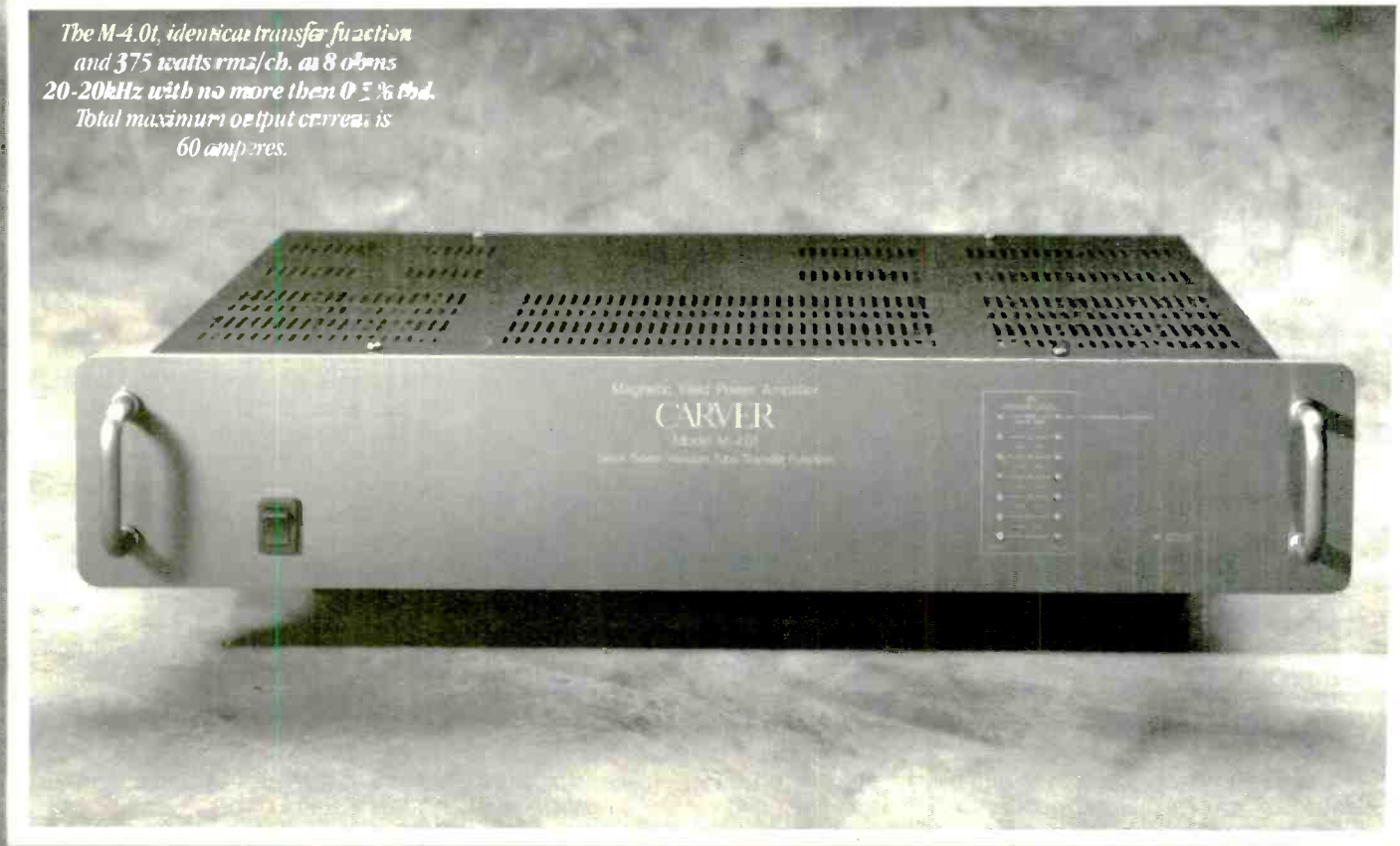
Capable of an astonishing 390 joules energy storage, the Silver Seven delivers ***a conservatively rated 375 watts into 8 ohms from 20Hz to 20kHz with no more than 0.5% distortion.*** On the 1-ohm tap, peak current is in excess of 35 amps!

Sonically, a pair (for stereo) of the flawless Silver Sevens almost defies description.

Powerful

Distributed in Canada by: evolution technology

"Because I wanted to share its magnificent sound with you we built the new Carver M-4.0t."



Superlatives are insufficient.

What does this have to do with the new M-4.0t?

Everything. Because the M-4.0t precisely duplicates the transfer function of the Silver Seven.

Ever wondered why two amplifiers of identical wattage can sound different? Or why two designs with different output ratings can sound much the same? In many cases, it's because each power amplifier exhibits a unique relationship between its input and output signals. Like human fingerprints, this *transfer function* is subtly distinct, defining much of the sonic character of the design. Bob has not only perfected the art of measuring an amplifier's transfer function, but is able to duplicate it in a completely dissimilar amplifier design! That's how he invested his solid state M-1.0t with the transfer function of a set of $5000 esoteric tube amps several years ago.

This time he's gone one better. Or two.

He's used this powerful scientific method to duplicate the transfer function of the Silver Seven in the new M-4.0t (now you know what the "t" signifies). Mind you, we are not saying the M-4.0t is *identical* to a pair of Silver Sevens. An M-4.0t weighs 23 pounds versus the Silver Seven at 300 pounds a pair. The Silver Seven stores 390 joules of energy while the M-4.0t stores none. As a Magnetic Field Power Amplifier the M-4.0t instantly draws the power it needs directly from the AC line.

Though in choosing the M-4.0t you may miss the warm glow of the Silver Seven's silver tipped vacuum tubes reflecting in polished black lacquer, be assured both amplifiers are the most musical, effortless, and open sounding you have ever heard. Bass is full and tight. Midrange is detailed, treble is pure and transparent.

Each can float a full symphony orchestra across the hemisphere of your living room with striking realism.

Bob Carver developed this incredible design for one reason: to bring you the best the world has to offer and the best amplifier value ever, and he has succeeded handsomely.

Listen to the new, incredibly affordable M-4.0t at your nearest Carver dealer. Or write us for more information. We'll even send you data on the Silver Seven. After all, if you ever want to move up from the M-4.0t, there's only one possible alternative.

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EDWARD TATNALL CANBY

CELEBRATING CDs

Illustration: Karen Stolper

The medium really *is* the message! Witness the fabulous CD (whose message is itself) and the new sounds that it engenders simply by existing.

In all its senses, *medium* lies between or, in a more recent sense, moves between in an active way to transmit information. Steak medium is neither raw nor burnt; the CD is neither the source of its audio nor the end product—sound out of your loudspeakers. But what it does, as a medium, is to determine the messages that are optimum via its very existence. And so in a dramatic way, you see, it *is* indeed the message. Or should we say, being audio people, the signal.

Nine years ago, when I heard the very first U.S. demo of the new CD system, which was put on in New York by Philips, I rather thought the CD was important. This was in spite of a so-so impression: At that press event, the CD was not persuasive. Except, of course, on paper—in the specs. Recently, I had been looking for the article I then wrote, but hadn't been able to find it. I am not indexed. (How can you index titles like mine?) Then, suddenly, by sheer accident, I slipped on it, literally, on my attic floor. An old copy of this magazine was lying slick cover up, and I stepped on it and slid a foot. (Is there anything slipperier than a slick magazine cover?) I cursed, got back on my feet, and sat down again with a thump. There it was. September, 1979. So recent, yet so distant!

Nobody else wrote a word about CD in that issue. Instead, we were filled with hot news about metal tape, which indeed was a sizzling topic at the time. The CD just slipped in almost unobserved—not even a title on my account. Was I the only one who attended the demo? I guess so. The whole thing was, in all truth, very low key, and it was only my sometimes useful sixth sense that got me there.

You understand, of course, that the laser disc was not just then unveiled. This was merely the small version that Philips had designed for audio alone. We had been hearing plenty about the very similar "TV disc" which used the same system—a laser-cut spiral of micro-pits, and another laser that could read them. So on the surface, so to speak, the CD didn't sound very sensational. And it wasn't the first such audio disc, either.

And yet here was the winner, the right medium, all set to bring us the right new messages! I remember being amused, at that time, by another audio disc—I think from JVC—which was 12 inches across and all digital, too. This other system came in two alternative versions, one for video and one for audio. (I think there was a common player.) Nice idea—maybe. But it provoked me to raucous amusement, and rightly, I think. I remarked facetiously that there might be a delay in the audio 12-incher's appearance because JVC probably was still *timing* the first prototype and wouldn't be finished for a couple of months.

Philips knew better. Instead of lamely adopting a standard size that played far too much audio for any practical purpose, the outwardly undemonstrative people in Holland took a radical step and launched an entirely incompatible and entirely new disc. It was designed to be the right size for all current audio consumer needs and, more important, to allow enough optional extra length for a wide array of future development in the way of new "messages." At that time, Philips announced a one-hour playing time per side, which was still hard to believe on such a tiny disc; as we now have the CD, that timing can be more than 70 minutes a side.

Philips added, casually, that though their disc was intended to be one-sided, a double-sided disc was possible if the need arose. (You will note that this has not yet happened. The single side still is exactly *right* for the way we use the CD nine years later.)

Do you begin to see that the medium—the CD—really is the message? The two, in other words, are, for all intents and purposes, one. The chicken and the egg. You can't think of them as separate. The CD was a very fine egg just waiting to be a chicken.

I did not learn, until much later, that the size of the Philips Compact Disc had a narrower, even cannier intent—to fit car stereo. Nine years ago, we were not yet very far into this booming business, but there again Philips was setting up still another message, one that is only now getting underway.

The Dutch do not go in for fancy histrionics and loudmouthed hype, which I recently realized is short for hyperbole. Either way, it is the gilding of the lily, as Shakespeare so nicely put it, and the Dutch are not famed for that.

SMART COMPANY

Stan Curtis loves to explore. Genial founder and prime force behind Cambridge Audio, it's in his nature to seek out inventive new solutions to seemingly insoluble problems.

Fortunately for all of us, Stan's relentless desire to improve the status quo in audio is plainly evident in the simple elegance and uncompromising quality of Cambridge components

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Of course, this comes as no great surprise to those who've experienced the extraordinary Cambridge CD-1 compact disc player. Reveling in its unheard of 32 bit resolution, the CD-1 is generally acknowledged as the world's finest player. The more affordable CD-2 boasts incredible 16 x oversampling for transparent audio reproduction.

In keeping with Stan's thinking, Cambridge's intelligent power amplifiers, preamps, integrateds and tuners are characterized by high current output and discrete circuitry to meet the challenges of digital program material.

Our components make the most sense because Stan Curtis and Cambridge are *smart*. Smart enough to make better ideas into better components.

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Bobby McFerrin—Simple Pleasures (EMI-Manhattan) 369306

Murray Perahia, Piano—Schubert: Sonata, Op. Posth., D. 959 Schumann: Sonata, Op. 22 (CBS Masterworks) 369207

Prince—Love Sexy (Paisley Park) 369124

Poison—Open Up And Say...Ahh! (Enigma) 368688

Johnny Mathis—Once In A While (Columbia) 368639

Boz Scaggs—Other Roads (Columbia) 368563

Lynyrd Skynyrd Band—Southern By The Grace Of God (MCA) 368357

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Mozart—Violin Concerti Nos. 1 & 4; Rondo, K. 269. Cho-Liang Lin; Leppard & English Chamber Orch. (CBS Masterworks) 368274

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George Strait—If You Ain't Lovin' (You Ain't Livin') (MCA) 366906

Tina Turner—Live In Europe (Capitol) 366898-396895

Philip Glass—Powaqqatsi (Nonesuch) 366757

Canadian Brass—Bach: Art Of The Fugue (CBS Master.) 366740

Mozart:—Symphonies Nos. 31 & 36; Don Giovanni Overture. E. Batiz, con. (Varese Sarabande) 366708

Good Morning Vietnam—original motion picture soundtrack (A&M) 366443

Joni Mitchell—Chalk Marks In A Rainstorm (Geffen) 366419

Rimsky-Korsakov:—Scheherazade. Borodin: Polovtsian Dances. Ozawa, Chicago Symphony Orch. (Angel) 366377

AC/DC—Blow Up Your Video (Atlantic) 366161

Midnight Oil—Diesel And Dust (Columbia) 366153

Toto—The Seventh One (Columbia) 366138

Billy Ocean—Tear Down These Walls (Jive/Arista) 365825

Beethoven—Symphony No. 9. Norrington, The London Classical Players (Angel) 365619

Neville Marriner—The Academy Plays Opera. Academy Of St. Martin-in-the-Fields (Angel) 365601

George Harrison—Cloud Nine (Dark Horse) 365494

Placido Domingo—A Love Until the End of Time (CBS) 365262

Vladimir Feltsman—American "Live" Debut (CBS Masterworks) 365254-395251

Verdi—Requiem. Muti, Pavarotti, Chorus & Orch. of Teatro Alla Scala (Angel) 365247-395244

James Taylor—Never Die Young (Columbia) 365189

David Lee Roth—Skyscraper (Warner Bros.) 365130

Arthur Fiedler & The Boston Pops—Capriccio Italien-Capriccio Espagnol (Orinda) 364257

Foreigner—Inside Information (Atlantic) 364018

Branford Marsalis—Renaissance (Columbia) 363739

Barry Manilow—Swing Street (Arista) 363655

The Manhattan Transfer—Brasil (Atlantic) 363648

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Diane Schuur And Count Basie Orch. (GRP) 361048

Billy Idol—Vital Idol (Chrysalis) 360107

Debbie Gibson—Out Of The Blue (Atlantic) 359927

Kiri Te Kanawa—Sings Gershwin (Angel) 359745

Aerosmith—Permanent Vacation (Geffen) 359075

Pat Metheny Group—Still Life (Talking) (Geffen) 359013

Tchaikovsky Waltzes—Comissiona, Houston Sym. (Pro Arte) 357871

Beethoven—Piano Conc. No. 5. Perahia; Haitink, Concertgebouw Orch. (CBS Masters.) 357657

Wynton Marsalis—Marsalis Standard Time (Columbia) 357640

Grateful Dead—In The Dark (Arista) 357087

Heart—Bad Animals (Capitol) 356667

Whitesnake (Geffen) 355362

Vladimir Horowitz—Favorite Chopin (CBS Masters.) 355156

Fleetwood Mac—Tango In The Night (Warner Bros.) 354902

U2—The Joshua Tree (Island) 354449

Bolling—Suite No. 2 For Flute & Jazz Piano Trio. Rampal, Flute (CBS) 353771

D. Parton/L. Ronstadt/E. Harris—Trio (Warner Bros.) 352633

Holst—The Planets. A. Davis, Toronto Sym. (Angel) 352534

Kathleen Battle—Sings Mozart. Previn, Royal Phil. (Angel) 350587

Pachelbel Canon—Other Digital Delights. Davis, Toronto Chamber Orch. (Fanfare) 348649

The Police—Every Breath You Take... The Singles (A&M) 348318

Glenn Miller Orchestra—In The Digital Mood (GRP) 347492

Dvorak—New World Symph. Batiz, London Phil. (Varese Sarab.) 346809

Peter Gabriel—So (Geffen) 345777

Branford Marsalis—Romances For Saxophone (CBS Master.) 345553

Anita Baker—Rapture (Elektra) 344622

Copland—Rodeo, Billy The Kid. Slatkin, St. Louis Sym. (Angel) 344184

Bach:—Goldberg Variations Glenn Gould, Piano (CBS Master.) 343251

Tchaikovsky—Eugene Onegin. Seiji Ozawa, Berlin Phil. (Angel) 343244

Barbra Streisand—The Broadway Album (Columbia) 342097

Puccini Heroines.—Kiri Te Kanawa, Eva Marton, etc. (CBS Master.) 339242

Gershwin— Rhapsody In Blue; etc. Tilson Thomas, L.A. Philharmonic (CBS Masters.) 339226

Billy Joel—Greatest Hits Vols. 1 & 2 (Columbia) 336396-396390

Brahms— Symphony No. 1 In C Minor. Klaus Tennstedt, London Philharmonic Orchestra (Angel) 332668

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Squeeze—Singles—45s And Under (A&M) 317974

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Traffic—John Barleycorn Must Die (Island) 364935

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Best Of The Doors (Elektra) 357616-397612

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Jimi Hendrix—Are You Experienced? (Reprise) 353102

Bob Dylan—Blood On The Tracks (Columbia) 353094

Yes—Fragile (Atlantic) 351957

Rolling Stones—Exile On Main Street (Rolling Stones Records) 350652

Van Morrison—Moondance (Warner Bros.) 349803

Buddy Holly—From The Orig. Master Tapes (MCA) 348110

Best Of The Monkees—Then And Now (Arista) 346536

The Beach Boys—Made In U.S.A. (Capitol) 346445

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Cat Stevens—Teaser And The Firecat (A&M) 209973

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Handel—Music For The Royal Fireworks. Menuhin, Royal Philharmonic (MCA Classics/Rpo) 358937

Sibelius:—Symphony No. 5 Esa-Pekka Salonen cond. Philharmonia Orchestra (CBS Master.) 358135

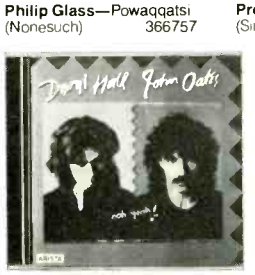
Kronos Quartet—White Man Sleeps. (Nonesuch) 358127

Randy Travis—Always & Forever (Warner Bros.) 356329

Gloria Estefan & Miami Sound Machine—Let It Loose (Epic) 356279

Whitney Houston—Whitney (Arista) 356154

David Bowie—Never Let Me Down (EMI Amer.) 355834

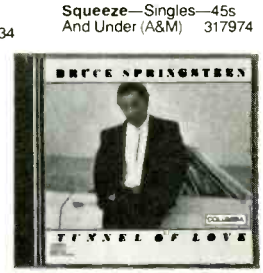


365775. Daryl Hall/John Oates—ooh yeah! (Arista)

364695. Wynton Marsalis—Baroque Music For Trumpets. (CBS Masterworks)

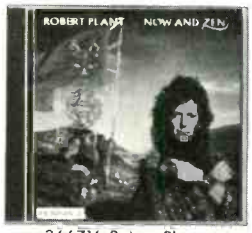
362228. George Michael—Faith. (Columbia)

362079. Michael Jackson—Bad. (Epic)



360115. Bruce Springsteen—Tunnel Of Love. (Columbia)

MUSIC SUPER SOUNDS



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Michael Feinstein—Remember: Michael Feinstein Sings Irving Berlin (Elektra) 369322

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By its very existence, the Compact Disc determines its optimum message. Thus, the medium is the message.

We are the hype experts, as we all know! And sometimes I really believe we do a service with it. Drama is a better word for the best of it, and we do need drama if we are to impress stodgy, stuck-in-the-mud minds both among consumers and professionals. I've purveyed *that* kind of hype all my life, and I trust it has been and still is moderately useful.

So that 1979 Philips CD demo, our very first, was unsensational, except maybe on paper. (I remember no mention of Sony, at the time, as a participant.) It could have used a lot more drama—within the bounds of good taste, as they say, or even without—considering the symbolic importance of the occasion. The parameters of the new disc were a forecast for the future, but the show itself wasn't. As a press "do," it was lukewarm.

Indeed, it almost fell apart. This was too early. The CD system was far from ready, a lot of the R & D still hanging unfinished. I suspect that Philips felt, probably with reason that, even so, it had better get things started. The competition was all over the place, and the sooner the Compact Disc made itself public, the better.

To begin with, there was only an extremely early prototype player, minus its electronics. It worked, it had a laser and a turntable, and it did play a handful of actual prototype CDs for us. But the bottom of the little box was empty. Instead, there was an impressive stack of big black boxes outside, a couple of feet high, substituting (in conventional circuitry) for the still nonexistent microcircuitry, chips et al., which now go inside all our players. This prototype, incidentally, was remarkably small, about the size of Sony's present portable CD.

The improvised temporary system, of course, had to be hooked together on the spot for the demo, which led to the usual problems devised by Mr. Murphy for his famous Law. We heard plenty of silence, all right—of the unintended sort—as the technicians frantically tweaked their connections. When the music did get going, there were problems of a more serious nature: Cueing. Starts and stops. The laser kept missing the beginnings of the music, fading in too late, dropping out clumsily. This had me distressed. "You cannot do *that* to music, laser or no laser," I thought to myself. "Is this the sort of automation we're going to have in place of the trusty, manual LP? Give me the LP, thanks."

That was unfortunate and misleading—how were we to know that it was only temporary, as of early in the game? For, of course, it was in astonishing contrast to the elegant CD control we now have, with its absolutely unprecedented ease and accuracy in cueing, one of the main foundations of its success among consumers. Clearly, Philips had been preoccupied with First Things, the basic system itself, and had not yet worked very far into what must have seemed to them, at the time, incidental details of operation. The peripherals, if you wish. But as we now know, the system was actually wonderfully amenable to control, and these controls were wisely and carefully developed—later. Whether by Philips' own engineers or by others, I do not know, but at that first demo *they were not there*, and that was a disastrous message to set forth.

As a matter of fact, interestingly enough, Philips did present a lot of information by word of mouth (and print) as to what was, shall I say, *possible*. (We did not see any demonstration that I remember.) And much of this was definitely *not* what we have now. From what I read in my own 1979 article, I gather that the "indexing" material was to be of an entirely different sort—letters and words, if I am right, presenting the actual titles or abbreviations thereof on the player "screen," which now shows numbers and track timings.

Even then, I could see (as a musician) that this was never going to work. Titles, both classical and pop, are too long! And abbreviations quickly become meaningless. I made up a grisly example, a hypothetical string piece by Karl Ditters von Dittersdorf (the longest name I could think of), complete with opus, number, and of course, key (say, F sharp minor), plus a subtitle. A whole paragraph of title, and the only useful way to get it into letters on the readout might be DIT! I can think of plenty of lengthy pop titles too: How about Jacques Brel, the guy who (in the title) is Alive & Well & Living in Paris? Some readout.

Can you imagine, then, a present Compact Disc system based on *letters*, not numbers? I vaguely remember that Philips also crowed gently about little bits of musical commentary that would/could appear on the player, direct from the disc. That was so preposterous I can't even remember the details. Each message to its own best medium, please. That sort of thing belongs in print, on paper—which is where you will now find it. Some genius understood, later, that this kind of flat-footed letter-based cueing was unimaginative and unworkable. The revised system, whoever was responsible for it, is now a vital part of the whole impact of the Compact Disc.

The genius, you see, is the mind that simplifies where other minds merely obfuscate. In that old article of mine, I spoke of the CD as being like the safety pin, one of those simple ideas that also took genius. How about Einstein? A mind that could reliably reduce the enormous workings of the universe to a simple formula, $E = mc^2$. On a lesser scale, our friend Ohm did the same thing.

Complexity, even in our modern world, is all too often just unimaginative confusion. The good things are simple still. I think, too, of Morse and his telegraph code—the first real electrical message and surely the first binary code—dot, dash. Earlier telegraphs were literal-minded and complex. Can you imagine a system that used some two-dozen separate circuits, one for each letter of the alphabet, to transmit information a few miles? Well, it once was built. Morse used only *one* wire, the return being through the earth.

So perhaps you would now like to amble over to your new CD player and take another look. Put on a disc—preferably something really complex and classical, with countless subheads and useful index points—and see how admirably and simply it all works. Not *too* simple. Just simple enough. A two-tiered number system, the big main divisions of the sound and, *only when needed*, the smaller and more closely spaced indexing. Genius? Is this, in fact, a wonderfully new message, as important as the audio itself?

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AUDIO SYSTEMS

Hi-Fi Sound On Hi-Fi VCRs

JOSEPH GIOVANELLI

The first home video recorders had terrible audio, with poor S/N (even with Dolby NR) and limited frequency response. However, it wasn't long before some sharp engineer realized that an audio signal could be imposed on an FM subcarrier and recorded along with the video information.

The result was to turn VCRs into audio recorders with very good specs. I've been using Hi-Fi VCRs for audio recording for some time, and I've learned a few things which may be helpful to readers who wish to use their VCRs for audio, or who are trying to make a decision as to which VCR to buy for this purpose.

These VCRs record sound on conventional longitudinal, or linear, audio tracks (though usually just monophonic ones), at the same time they record it on their FM-subcarrier tracks. This allows compatibility with conventional VCRs, which cannot play back Hi-Fi audio tracks. Having linear tracks on Hi-Fi VCRs also allows you to make an audio overdub (if the VCR has that function), since the Hi-Fi tracks of such decks cannot be overdubbed without erasing video information.

Hi-Fi audio is laid down by the video head drum, which requires sync pulses to keep it aligned with the proper tracks on the tape. Without sync, the recorder will behave erratically, much like a television that suffers from sync problems. When recording video, the sync pulses can be obtained from the composite video signal, but the VCR must provide its own sync when it is used as a stand-alone audio recorder. Most manufacturers of Hi-Fi VCRs have made provisions for this.

Because a VCR's Hi-Fi audio channels are FM, the frequency response of these channels is unaffected by tape speed, and the wow and flutter associated with conventional, longitudinal tracks is inaudible, even at the slowest speeds. However, the audio which is recorded on the standard linear tracks will suffer from wow and flutter and from limited frequency response, especially at slow tape speeds.

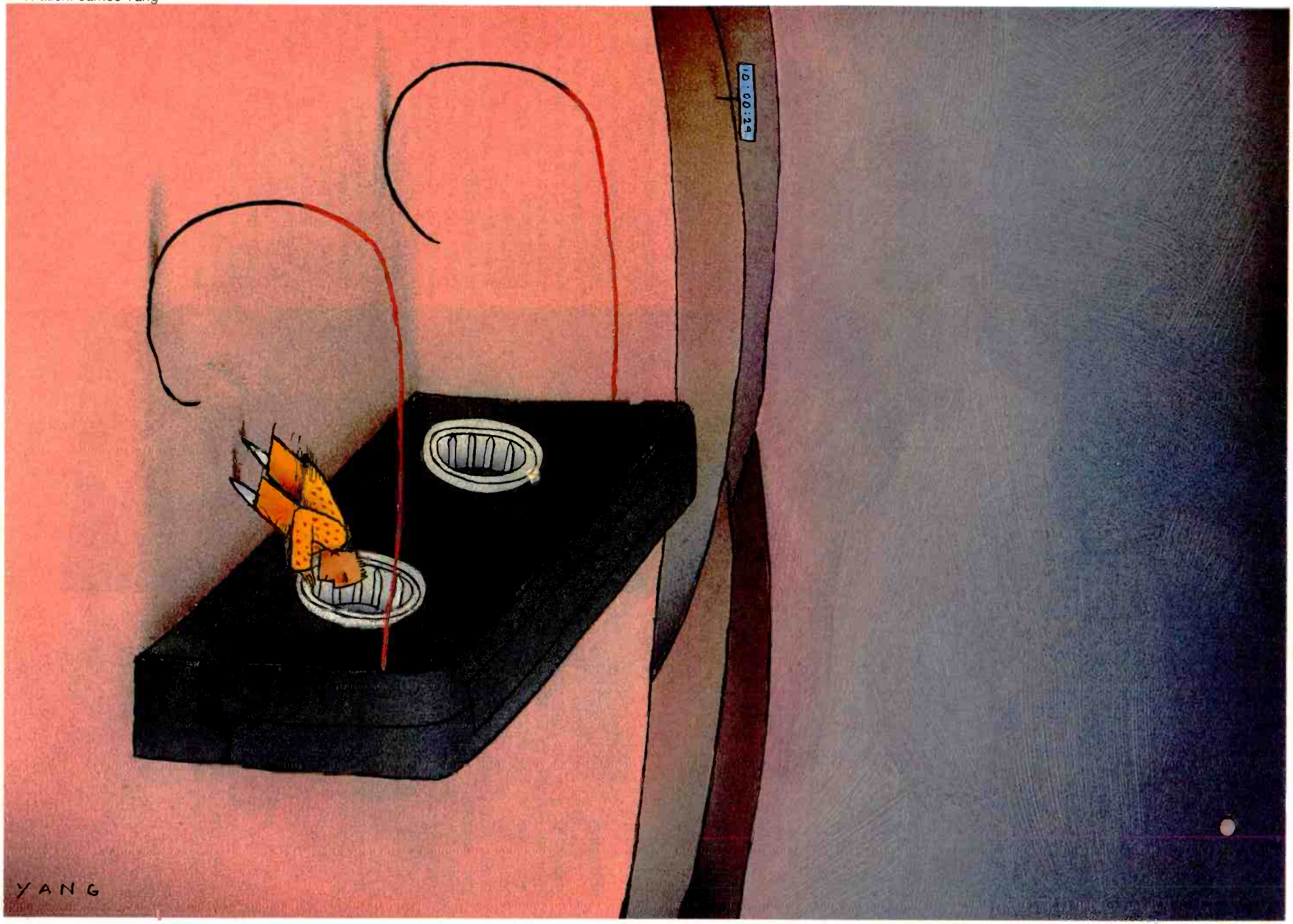
Hi-Fi Editing

There's more to recording than recording! The open-reel recorder makes editing quite easy. By marking the tape in the appropriate places, unwanted sections can readily be cut out and the tape respliced. Sections from one point in the tape can be moved to another by similar methods. But with videocassettes, splicing is not an option. It would be almost impossible to cut the tape without producing glitches in the audio, video, and sync, which sends a VCR into a frenzy, and the splice might catch on the VCR's rotating heads, damaging both tape and heads.

A good open-reel or cassette recorder will usually have a pause control, which allows the tape to be stopped and started with the capstan motor running at operating speed. Thus, one can almost instantly start up or stop the tape. Usually, the pause control can be actuated without introducing clicks.

You won't find this feature on VCRs—a point to remember if you're thinking of using one as

Illustration: James Yang



your primary audio deck. Because of the way a VCR handles tape, it takes time for the machine to get the tape back up to speed and to reestablish sync; only then is audio muting cancelled, either for recording or for playback. If the tape is set into motion from stop mode, still more time is lost while the threading mechanisms extract tape from the cassette.

There is another peculiarity related to the recording process. Because of the need to maintain sync, pressing the pause button does not merely stop the tape in the usual manner. Rather, the tape backs up a distance so it can get up to running speed and lock sync before recording starts. Thus, if you stop a recording just at the end of a passage, part of the recording will be lost. You must learn to wait a bit and not be too quick on the draw. If you plan to copy one tape to another straight through, however, these pause problems will be of no consequence.

Speaking of copying, I was running out of space to store all of my open-reel tapes and my collection of 78-rpm discs. I transferred all of this material onto Hi-Fi videocassettes. I used a VHS deck, running it at its slowest speed. Using T120 tapes, I could put approximately six hours of programming on a single tape. Can you imagine how many 10-inch 78-rpm discs I fit onto a tape?

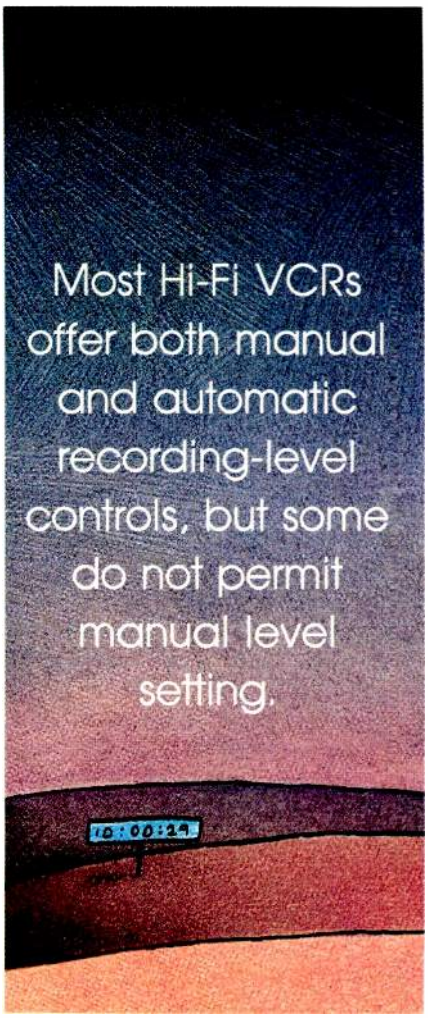
Indexing

If you store large amounts of information on a single tape, the means must be available for locating any desired section. The simplest solution is to set the tape counter to 0000, or 00:00, at the start of a new tape. At each important point in that recording, mark down the counter reading and what programming occurs there. Such a notation might read: "173: Start of *Music for Dreaming*, Paul Weston and Orch." You might break down your index further, to show the start of each selection on an album.

I suggest that you arrange your material in logical units—logical to you, at any rate. This means that you can't use just any selection of the proper length to fill the last few minutes of the tape. You may sometimes wind up with some blank space at the tape's end, when the only selections that logically belong on the tape are too long to fit in the remaining space.

All your indexing information could be entered into a notebook, but if you have a computer, you might want to enter that information into some kind of data-base program. By arranging your material into logical "fields," you then can use appropriate search criteria to find specific sections of your tapes. One of the many advantages of a computer is that it can search through information for many tapes simultaneously, provided your records and search criteria are properly organized. Be sure to make backups of your data though, and retain your original notes.

I also index my Hi-Fi VCR tapes sonically, on my VCR's linear audio tracks. After recording and indexing music or other selections, I use my VCR's "Audio Dub" function to record announcements on the linear track. (This function does not affect the Hi-Fi track, as I mentioned earlier.) My announcements might include the name and timing of selections, or an audio "reading" of the album's liner notes.



Taking this idea a bit further, I add a low-frequency tone to the linear track just before the end of each selection on the Hi-Fi track. Then, with the deck in fast-search mode, I listen for these tones, which are easy to hear because their pitch increases as the tape speeds up.

To the experienced VCR user, this may seem impossible, since almost all decks mute the audio output when in fast-search modes—as mine did, until I modified it. On most VHS decks, this is impossible to do in fast-wind modes, since the tape is pulled back into the cassette before the wind begins. I have not worked with Beta, but think that the tape may be close enough to the heads in fast-wind to allow this audible cueing technique. (You should make the modifications I mentioned only if you have a complete service manual for your model VCR, understand the circuitry, and are very skilled with tools. If not, don't try it!)

The reason that you hear no signal in search mode is that the audio from both the linear and Hi-Fi tracks is muted, even though the tape is still in proper position to play these tracks. The muting is controlled by the microprocessor, which governs the operation of the entire VCR. This microprocessor senses when sync is established and removes the mute.

In my equipment, at any rate, I only needed to cut one circuit foil leading from the microprocessor to the muting circuit, which did not affect muting during recording startup. I found so many layers of muting and error checking that it was difficult to make the right choice the first time; I literally had to cut and try various possible points in the circuit until I located the one I needed.

When I search forward or backward, I hear the sound of the linear track chattering away. Where the track is blank, I just hear tape hiss. I can also listen to the chatter on the Hi-Fi tracks by resetting the deck's audio selector switch. This sounds similar to the fast-search modes on CD players. You might recognize music, but it will sound broken up, robbed of dynamics and distinctness. Still, listening to this

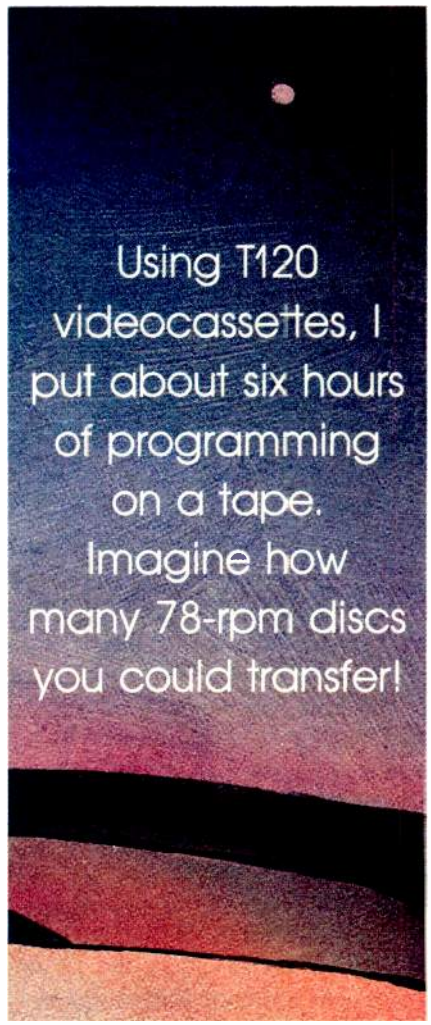
is not as unpleasant as listening to the speeded-up chatter on the linear tracks.

Unmuted audio is a mixed blessing. When you use your VCR in the normal way, you will hear some strong clicks when you begin to play a tape, whether from a dead stop or from pause. You also will hear the unit switch between linear and Hi-Fi tracks as sync is established. I found both the clicks and the switching very annoying, and overcame the problem by adding a simple toggle switch to the rear panel of my machine. This switch restores the circuit foil to normal in one position and opens it in the other. If your machine requires more than a single cut, however, you will need a more elaborate switch.

What I have said about overdubbing the linear tracks and listening to them at high speed should also apply to people who use PCM encoders to make digital recordings on VCRs, whether they use conventional or Hi-Fi decks. I doubt, however, that one could listen to the digital tracks at high speed.

Until now, I have mentioned only the audio capabilities of Hi-Fi VCRs. Nevertheless, they can record video along with audio. As you record sound through the deck's audio input jacks, you can simultaneously use the video inputs to record visuals from a camera or another VCR. If your deck has a "Simulcast" switch, which allows the audio and video inputs to be selected independently, you can also record video from the VCR's built-in tuner. (This does not apply, of course, to recording with a PCM encoder, since the PCM information occupies the video tracks.)

So why not add video to your audio? Perhaps the video could show the composer or musician you are hearing on the audio tracks, or maybe notes you've written describing the music. If you put typed or printed notes on screen, keep the letters large or they may not be readable. Try about 15 lines of text, about 60 characters per line, to see how legible it looks on your screen. And leave some white space around your text when you shoot it, to make sure none of the words get cropped off the edge of the screen. All video accompaniments must be carefully planned, because the audio and video *must* be recorded simultaneously. On today's videocassette decks, you cannot "punch in" directly from play to recording.



Controlling Level

A few words of caution are required before you buy a Hi-Fi VCR. While most offer both manual and automatic recording-level controls, some machines do not allow manual level setting. Since this is most often true of portable VCRs, stick with tabletop models if you do not need portability. They are cheaper and more likely to provide manual control of recording level.

Nevertheless, when I needed a second VCR for dubbing, I found it advantageous to get one capable of battery operation. I then discovered that all is not lost as far as controlling audio levels on a portable VCR. The trouble with automatic level controls is that they compress the signal. Fortunately, if you don't feed in signals beyond the level that produces a 0-VU recording, the effects of automatic level circuitry won't be significant. I therefore arranged to drive my portable VCR's audio inputs from a mixer which had its own level meter, and determined what output level from this mixer would produce 0 VU on my VCR.

I have encountered one problem with my portable machine which I have not completely solved. Hi-Fi VCRs use "compansion" to increase their S/N ratio. There appears to be a nonlinearity in this compress/expand system, and it is most noticeable when recording extremely low-level audio signals. As a result, I am occasionally conscious of background sounds being modulated by the program's changing dynamics. If the program source is an open-reel tape, the level of tape hiss will vary slightly. If the source is a live performance, ambient sounds in the room can sometimes change just a bit in level. Fortunately, I cannot detect this condition most of the time. I found that I could improve matters by changing the IC responsible for my portable VCR's recording compression. Experiments demonstrated that the playback expansion was not responsible for this problem.

By comparing notes with a couple of my friends who use Hi-Fi recorders, I found that they had experienced the same problems, mainly with portable equipment. Because my desktop unit does not suffer from this "companding" problem, and because my portable machine plays back fine, I use the portable to play tapes while making copies of these tapes on the desktop unit.

As with any important recording, it is well to stay clear of bargain tapes. They will prove not to be a bargain if, after a few plays, you find tracking problems. These will manifest themselves in the form of odd flutter, which can usually be corrected by adjusting the tracking control.

It was necessary for me to point out some negative aspects of Hi-Fi VCRs (VHS, at any rate) in order to present a balanced picture. Nevertheless, I think you will discover that if you are careful, you will enjoy many happy hours of recording and listening.

THE AUDIO INTERVIEW

LEONARD FEATHER

A Life In Jazz

Photograph: Michael Ochs Archives

A 14-year-old boy's chance listening to Louis Armstrong's "West End Blues" in a Kensington, England record shop in 1928 led to one of the most illustrious careers in jazz. In his 1987 autobiography, *The Jazz Years: Earwitness to an Era*, music critic/producer/songwriter/jazz historian Leonard Feather maintains that this single incident determined the pattern of his life, providing him with "a sense of direction, a lifestyle, an obsessive concern with every aspect of jazz." This passion eventually led Feather to leave England because nothing was happening in the jazz scene there. But long before he emigrated to the United States, Feather joined the jazz vanguard.

His rise to prominence began with a letter to the editor of the British magazine *Melody Maker*, in which Feather questioned why no jazz was written in waltz time. This concept, considered outrageous at the time, was only the first of many controversial issues which Feather would introduce in subsequent letters to the editor. In addition to stirring heated debate about the parameters of the then-new music form, jazz, these missives prompted the editor to sign Feather as a regular *Melody Maker* columnist. From his first magazine essays to his critics' jazz polls for *Esquire* to his blindfold tests for *Down Beat*, Feather was a controversial innovator, calling for audiences and critics alike to reexamine their perceptions of modern jazz. His books, like his essays, sought to enlighten the jazz audience and to give them more knowledge about the medium and its stars. In addition to his autobiography, Feather has written *The Encyclopedia of Jazz* (1955), considered by many to be *the* definitive book on modern jazz music, *The Book of Jazz* (1965), and *The Passion for Jazz* (1980).

A champion of be-bop, Feather helped bring luminaries such as Charlie Parker and Dizzy Gillespie into the public eye. He was famous for taking chances on "unknown" artists such as Sarah Vaughan and Dinah Washington, and for finding or writing songs and arrangements to highlight their specific talents. Many times, these efforts met with criticism, as did the be-bop movement as a whole. Nevertheless, Feather's life work as a producer, songwriter, music critic, and author emerges as both revolutionary and evolutionary, and many of his musings have gone on to become musical facts. *K.C.*

TED FOX

Let's talk about your first foray into producing in England, in 1936, with Benny Carter. You suggested doing jazz in waltz time for that session, which was a revolutionary concept at the time.

It was, yeah. And what seems strange to me is why should it be revolutionary? You know, what is abnormal about ¾? Benny Carter happened to agree. There was no arrangement. That record was completely ad-libbed. We just played the blues—we played 24 bars instead of 12. But it made headlines in many of the newspapers and a lot of the music critics put it down. They said the idea had about as much hope of posterity as a mule [laughter].

Hadn't it ever been tried before?

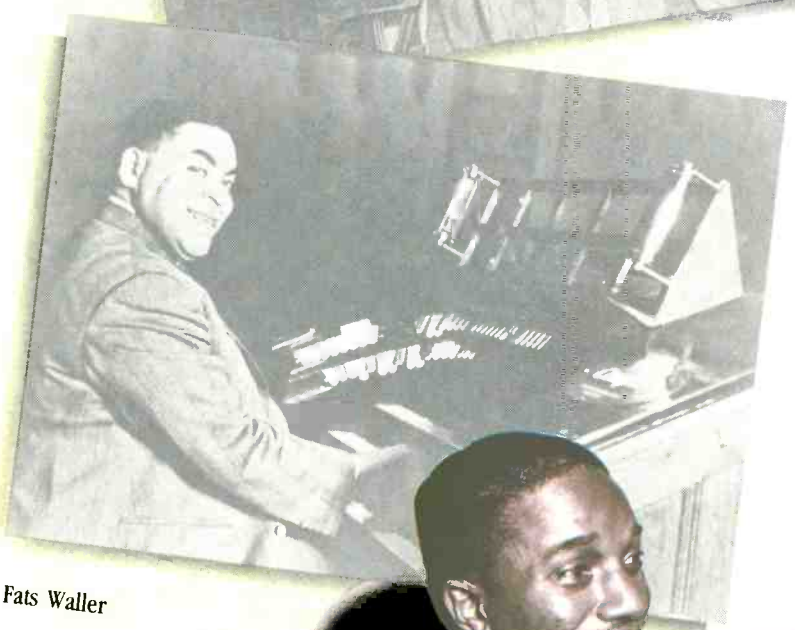
I think there were probably one or two jazz records that purported to be jazz waltzes. But I was not aware of anything. As far as anyone could tell, it was the first of its concept—a real jazz record, not pseudo-jazz.

Why did you try such a revolutionary move on your first producing attempt?

Because the first thing that got me some prominence was writing a letter to the editor of the *Melody Maker*, saying why is there no jazz in ¾ time? That caused a bit of an

Photography: ©1988, Mark Harmel

London, 1936: Benny Carter (at piano) conducted an all-star English jazz ensemble for a Vocalion recording which Feather supervised; trombonist Ted Heath (fifth from right) played at this session.



Fats Waller

Hot Lips Page

Photographs: Frank Driggs Collection

uproar, a lot of angry letters to the editor that said, "Asking for jazz in ¾ time is like asking for a red piece of green chalk." So, I just wanted to prove the point.

Benny dug it.

Yeah, but it was not on the first session, it was two or three sessions later. The first session was a big band date on which Benny had a beautiful ballad called "Nightfall." It was the first time he ever played tenor, and it was a beautiful sound—a beautiful arrangement and a beautiful tune—so we got off to a very good start. Later, on a small band date, I did the waltz. It was maybe the third or fourth session.

You said it was Benny Carter, not Benny Goodman, who had the first integrated jazz orchestra.

Absolutely, yeah. But nobody really recognized that. You know, people don't give Benny enough credit.

Let's talk about someone who has gotten lots of recognition, Fats Waller, whom you have worked with. What was he like in the studio?

Really very casual most of the time. It was hardly like a recording session. He'd shuffle through some sheets of music. The A&R man at RCA picked the tunes. He probably gave Fats 20 tunes and said, you know, pick out four of these. It was done on a very sloppy basis, I'd say. Fats had this nice little band, and he would just do the tunes and in essence poke fun at them, you know. And it turned out well because he was able to make silk purses out of sows' ears. I didn't produce any sessions, except the one in England. When he came to London, I put the band together for him—similar to the one he had in America—and it was a nice little date. It was a little bit better organized there. He was certainly taking care of business more than he had in the New York sessions. But he was wonderful to work with—very casual, very informal.

Was he a big drinker in the studio?

Oh yes. He was a big drinker, period. But he was not an alcoholic.

Was the English recording scene a very separate thing from the American? Did they cross over much?

No, I don't suppose they crossed over much, except that with Fats being under contract to RCA in New York, he had to record for their equivalent in

England, which was His Master's Voice. There just wasn't that much jazz recording done in England. There weren't that many jazz musicians there—American musicians. Fats Waller only got in technically, as an entertainer. So he was allowed in [under English union work rules] and he went to the Palladium and sang. Benny Carter got in because he was writing arrangements for the BBC dance orchestra. There was the musicians' union ban against Americans in England, and against British musicians in the United States, which went on for something like 20 years. That was one of the reasons I finally left England, because there was nothing happening on the jazz scene.

Wasn't that kind of counterproductive though? At least on the British musicians' part?

Well, it was. Nobody seems to know to this day who really originated the problem. I think it probably started over here with [the head of the musicians' union, James C.] Petrillo. He died a couple of years ago. He was the very, very all-powerful head of the AF of M [American Federation of Musicians], and what he said went. He's the one who caused the first recording ban when they stopped all phonograph records for a couple years, which I thought was disastrous. August 1, 1942, the first one that lasted, well . . . some companies signed up after a year or so—Capitol and Decca—but RCA Victor and Columbia didn't sign up for over two years. People like Duke Ellington, who was a very, very important artist, didn't get to record through that entire period. And then there was another recording ban through almost all of 1948. I was lucky I hadn't thrown all my eggs into the recording/songwriting basket, or I would have had nothing to do for all those years.

Let's talk about Duke Ellington. You went to work for him. . . .

Originally in 1942, when he was getting ready to do his first Carnegie Hall concert. I did publicity for him, promotional ideas and so forth, and I went around to the various cities he was playing and did media for him. He put this first concert on—it was [his agent] William Morris' idea—and would you believe it was a benefit for Russian War Relief? I just heard on television last night that 33% of the American public today does not know that Russia was our ally in World War II. Incredible.

You also worked with him more directly, with his music.

Well, I worked with him more directly in several productions later on. He had a disc jockey show for a while, not very long, and I helped to write the scripts and supervised those things. And a couple years later I went to work for his publishing company, and wasn't very effective there. Then he said, "We're going to start a record company." So his son Mercer and I started Mercer Records. We just recorded everything. We did Ellington with Billy Strayhorn, doing piano duets. We did a Johnny Hodges session, and a session with Al Hibbler. Also, the first one that we did, which got a lot of publicity, was Oscar Pettiford, the bass player, playing cello. There had never been a jazz cello session. And we had that company for a couple years, and of course we didn't make money. We got caught in the crush between the end of 78s and the beginning of LPs. Duke was a silent partner because he was under contract at Columbia.

Columbia never picked on you?

They never bothered. Duke never made any big band records for us. He was just one of the sidemen on the sessions.

Now, what would you do as producer and A&R man on those sessions?

You have to select the tunes and try to get things started, because people would just amble into the studio 20 minutes, a half-hour, 45 minutes late. It was very, very casual. Billy Strayhorn was one of the most casual people I'd ever met, but also one of the most talented. He would get me crazy, not showing up with the arrangements in the studio until the last minute. Finishing them up in the studio. But, it worked because he was a magnificent talent. Strayhorn was a very good friend, too. You know, one of the first things Strayhorn and I did after the Carnegie Hall concert was write this book called *Duke Ellington Piano Method for Blues*. It sold for a dollar and a half. It sold predominantly because of Duke's name. We sort of ghosted it for him and took all these piano solos off his recordings. Strayhorn did the hard ones. Neither of us had ever taken music off records before, and it's not easy. But in the studio, there wasn't that much in terms of creative work to be done, because Duke usually had pretty much his own ideas about what he wanted to do. You don't tell Duke how to run his music, so it was not a terribly responsible job. It was very easy. I mean, recording in general was so easy in those days; cut your four tunes in three hours. And the scale was very low. I think the scale was maybe $30, double for the leader—maybe it went up to $45. And when I first started recording in New York, the scale was $20. That was the Hot Lips Page record. We did the entire session . . . Hot Lips Page $40, $40 for me, $20 to the guitar player, and $20 for the bass player. So the whole thing cost $120.

During the periods when recording was banned, I was lucky all my eggs weren't in the recording and songwriting basket.

Let's talk about the Hot Lips Page recording session.

He was a really fine trumpet player in the Louis Armstrong tradition. He hadn't been doing very much, he just made some rather mediocre records, with other singers featured instead of him. I just liked the idea of at least a modest attempt at doing the blues, because he loved to sing the blues and he hadn't done too much of it lately. So I went to RCA records. They said, "We have no budget today." I said, "Well, I'll do the best I can with three men." So I decided the best way to do three men was a guitar, bass, and trumpet, and on a couple of sides I sat in at the piano. But I wasn't able to do anything officially until after the union delegate left.

You were doing songs you wrote?

Yeah, I wrote some tunes. One of them turned out to be "Evil Man's Blues," which became "Evil Gal Blues" for Dinah Washington. There were various

Photographs: Frank Driggs Collection

1946: Mercer Ellington (top, center) and his band.

Coleman Hawkins

Don Byas

other versions of the song done through the years.

Now in the '40s, when you helped launch the* Esquire *jazz poll, you and that whole effort were really met with a lot of criticism.

Fantastic criticism.

Why?

Imagine what it was like. Because there were a lot of people, even musicians, who resented anything they couldn't understand.

What was not to understand?

Well, at the time, be-bop seemed very complicated and actually beyond the comprehension of most of the critics.

But it wasn't just a be-bop poll.

No, it wasn't. It was just a poll of the greatest jazz musicians, and as it turned out, you know, the particular experts we picked to do the voting had a much broader point of view than some of these right-wing (if I may use that term) critics, or a lot of the public, or even some of the musicians who were afraid of be-bop. I mean, a lot of it was being afraid. You know: "These young guys are overtaking us. Doing something we can't figure out." But it's a matter of talent and luck. I guess talent will out. So I was very happy with the *Esquire* poll. It was the only poll that someone like Billy Strayhorn ever won. It was also the only poll that Lucky Thompson, who's a marvelous saxophonist, ever won. And there were a lot of people who never won any other poll except the *Esquire*.

This was a critics' poll.

It was the first-ever critics' poll, and it was a good idea because at that time, the readers' polls, both in *Down Beat* and *Metronome*, were ridiculous. In saxophone, the leaders would be Charlie Barnet and Tex Beneke. Because Charlie had a very popular white band and Tex Beneke was with the most popular white band of all, Glenn Miller. After that, you got the Coleman Hawkins and the Ben Websters and the real giants whom Charlie Barnet probably admired better than he admired himself. So there was a very terrible racial undertone to a lot of things that happened in those days, and that was one of the reasons it was necessary to get a critics' poll together. And we had one or two black voters in the poll, too. One of them was Dan Burley, who was

then a writer for the Associated Negro Press and also a jazz pianist.

Now, out of that whole brouhaha, the term "moldy fig" originated. Many people credited you with that.

That's not true, because it was in a letter to the editor in *Esquire*. I forget the guy's name. He was in the Navy, I think, and he sent a letter using that term. Of course, Barry Ulanov of *Metronome* picked it up, then I picked it up, and everybody did, and it became general. But for some reason, it was assumed that I had coined the term. It's funny, people are still using that. And there *are* some moldy figs among us to this day.

You, of course, were exactly the opposite. I want to talk about some of the people that you recorded before they had recording contracts: Sarah Vaughan, Dizzy Gillespie, Charlie Parker.

Well, Sarah Vaughan came about as the result of. . . . I ran into Dizzy on the street one day, and he had a demo record with him that Sarah'd made. He said, "I want you to come upstairs and hear this." We were outside the recording studio, and we went upstairs, and he played it for me. And I already knew Sarah from hearing her in the Earl Hines Orchestra. I think at this point she was with the Billy Eckstine Orchestra. So I liked this demo that Dizzy played very much, and I said I would see if I could get her a date. I went to a couple of companies. There was no interest—unknown singer with a band that's led by another singer, Billy Eckstine, didn't sound like it meant anything. Finally, there was this Hungarian guy named Donald Gabor, who had a company called Continental records. I can't remember how I got to know him or heard about him, but I sold him on the idea and he said, "Okay, go ahead if you can do it cheap enough." And I made the mistake of having myself play piano on the session to save money. Which was not a good idea because I didn't read music very well, particularly on "A Night in Tunisia," which I just couldn't read. Dizzy had to come over and play piano for me on that number. And I had seen Sarah, she was living in a hotel around from the Apollo Theatre. I went up to see her and talk about the tunes. I gave her this ballad of mine called "Signing Off." It was quite a pretty tune, and she did a nice job on that. She also sang a blues. What else? "Interlude," which was the first lyric version of "A Night in Tunisia."

She was a kid.

I think she was either 19 or 20, and she was very awkward and had this big gap between her teeth which was later corrected. She knew nothing about recording. I think she'd made one tune—that was the only recording she'd done at all. But it turned out nicely. I put a little band together with Dizzy. You could tell that she had something different. Incidentally, it was done on New Year's Eve 1944, in some little studio at the top of the RKO building on Sixth Avenue. I think it was fairly obvious that there was something there, and the records did well enough, so they said, "We owe it to you to make another session." The second session, I got Charlie Parker as well as Dizzy, and that was my big mistake, because Charlie Parker, much as I liked him, was not the most dependable person, and he just wandered into the studio about 45 minutes late without even saying "Hi, Leonard." No apology, no explanation. As a result, we only got three tunes instead of four. But that also produced a lot of things. Charlie had a wonderful solo. Sarah sang beautifully. We did a tune of Peggy Lee's called "What More Can a Woman Do?" and another ballad of mine called "I'd Rather Have a Memory than a Dream" that had some nice changes. I like to write good changes and Sarah's ear for changes is fantastic. And there again, what we did get in was very easily done. Very basic arrangements. After that, there was a gap for a while, and then she started with the Musicraft label and was on her way. She cut a lot of great things for them. She did "It's Magic," and other things that really sold quite well.

Did you ever think, in those years, that you should sign up some of these people with contracts?

Well, I wasn't a very good businessman. I didn't think of things in a businessman sort of way. And also, I was still kind of tied down with this image of being a critic which was, you know, a confusing thing. When I had the big hits with Dinah Washington, if I'd had any sense, I might have just gone into songwriting and record producing full time. But as it turned out, there was another record strike later on, and I would have had nothing to do.

The *Esquire* jazz poll was the first-ever critics' poll, and it was a good idea, too, because the readers' polls were ridiculous.

It's amazing that, at that point, nobody really wanted Sarah or Bird or Diz.

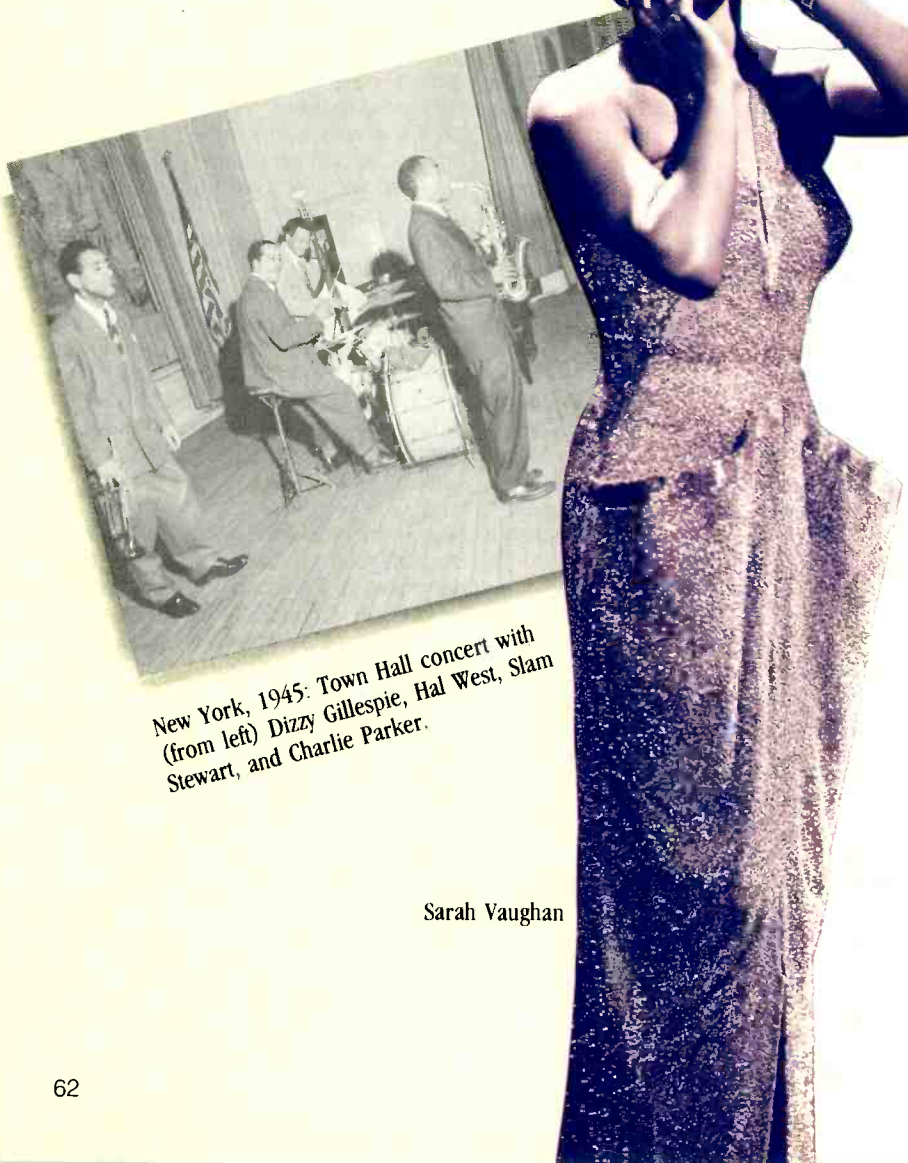
Yeah, that's right. Well, Dizzy, let me go back to Dizzy. I first used him on a record date, I think it was January '42—around there. It was a Pete Brown date (he was a marvelous saxophone player), and I had Helen Humes as the featured vocalist. She had just left the Count Basie band, so it was really a Pete Brown/Helen Humes record date. I had heard Benny Carter lead a small band on 52nd Street, with Jimmy Hamilton on clarinet (he was my clarinet teacher, I studied with him), and Dizzy on trumpet. So I used Jimmy Hamilton and Dizzy on this date, and stupidly, I did not let Dizzy take a solo. I thought, "He's not a blues player. He's a marvelous player, but he doesn't fit this kind of a session." So I missed the opportunity of having the first small band session that really featured Dizzy extensively. Because except for one record of the Lionel Hampton days, you know, he had only recorded with Cab Calloway, another big band. But it was a nice session anyway.

Didn't you ever record him as a band leader?

Yes. The first time I recorded him as a leader was when I finally persuaded RCA's Steve Sholes, a very nice guy who later became famous for bringing Elvis Presley to RCA. . . . I talked Steve into letting me do a be-bop album. Well, he wouldn't even allow me to use that word, but at least the sessions were along those lines. So I brought in Dizzy, leading this small group with Don Byas on saxophone, Ray Brown on bass. We did a nice little small band

Photographs: Frank Driggs Collection

1946: Feather brought Duke Ellington and Louis Armstrong together for the first time in a studio; the two jazz greats recorded "Long, Long Journey" and Billy Strayhorn (center) played piano for the rest of the session.



New York, 1945: Town Hall concert with (from left) Dizzy Gillespie, Hal West, Slam Stewart, and Charlie Parker.

Sarah Vaughan

session as part of this be-bop project, which came out on one of those 78 albums that had four records in one box, each one by a different group: Dizzy Gillespie, Coleman Hawkins, and so forth. About a year after I brought Dizzy to RCA, they signed him up exclusively, which was very rewarding. He stayed there with his big band and recorded for a couple of years.

In the early to mid '40s, you were very much associated with the popularization and rise of be-bop. Do you feel the music was underrecorded in those seminal early years?

Yes, but partly because of the recording ban. When Earl Hines had that fantastic band, with Dizzy, Charlie Parker, and Sarah Vaughan working for him, he couldn't record. That was during the recording ban, in 1942 and '43. So a lot of it was due to that, and some of it was due to the fact that there was tremendous resentment of be-bop on the part of record companies. As I said, RCA wouldn't use the word, but at least they let me record some of the music. Be-bop was a poisonous word. It was the object of so much ridicule and contumely. When I wrote a book called *Inside Bebop*, which came out in 1949, the publisher got cold feet and later on changed the name of the book to *Inside Jazz*.

Did we miss some great material that never got down on records because of all this?

I would think so. Mainly the Earl Hines Orchestra, during the seminal period when he had arrangements by Dizzy, and solos by Dizzy and Bird . . . and Budd Johnson and others who were very much a part of the vanguard of be-bop. . . . I think the recording industry lost an inestimable amount of great music as a result of the two bans, but particularly the first one. The second ban, in 1948, was not so significant. It lasted slightly under a year, but even at that it was pointless. It didn't really accomplish anything for the musicians.

Often, on your sessions as a producer, arranger, writer, you used a pseudonym. Why?

Because I knew from experience that anything with my name on it would get knocked or ignored by some of the other critics who hated be-bop and, as a result, detested everything I stood for. So I thought, well, the hell with it, I'll

just use another name. So I started writing a lot of songs with all kinds of different names. Sometimes I'd put two pseudonyms on the songs I wrote, to really confuse people. And several times I borrowed the real name of my friend Billy Moore, the arranger. He said, "It's all right to use my name." So if they thought it was by Billy Moore, they had more respect for it. One of my biggest hits came out under that name—"Baby Get Lost," which Dinah recorded. It was just a very difficult time. I don't want to sound like a martyr, because it was much more difficult for the musicians than it was for me. But I still was the object of very, very vicious attacks by be-bop haters. And most of them wound up turning around and recording be-bop themselves, which is ironic.

When you used the pseudonym, was it a problem collecting royalties and such?

Oh no. I'd just put whatever the phony name was and the right address.

So you were getting checks under all kinds of names?

Yeah, well, not very often because nothing I did sold very much until the Dinah Washington tunes, which were under my name. That was another problem.

We'll get into that. In your book The Jazz Years ***[published by Da Capo Press], you speak of the problems you faced, of sometimes having your compositions rejected by an A&R guy you may have offended or something. How often was that a problem?***

I don't really know, because a lot of them might have rejected me because the songs weren't any good. I'm sure I didn't write all masterpieces. And nobody ever told me, "We don't want to record this because it's by you." It was a little more subtle than that. I'm sure it happened, and I'm sure it happened to musicians, too.

How often were you in a position where you were trying to get another artist, who you may not have had any involvement with, to record your songs?

Well, rarely actually, because a large number of my songs that got recorded were on sessions that I produced. And the ones that were successful were recorded by other artists because they were doing cover versions. Only last year, to my amazement, Koko Taylor, the blues singer, did a cover of "Blow-top Blues," which had been one of Dinah Washington's hits. Those things happen spontaneously. I never met Koko Taylor. I never even heard her sing in person.

It seems that there is a potential for conflict of interest when you are the A&R guy, the producer, and the writer of the songs.

Oh yeah, but mostly I only worked with people where I felt, and they felt, that the songs were suitable. In many cases, we just recorded other people's songs if they seemed more appropriate. I didn't just go into the studio and say, "Well, you got to take these four songs and they're all mine." There was some kind of mutual agreement.

But that kind of stuff happened, of course.

I suppose it did, yeah. To my knowledge, though, there was never any kind of open hostility—not wanting to record someone. And in the case of Dinah Washington and quite a few others, it turned out very good—as good for them as it was for me.

But wasn't that also a criticism that you got sometimes from the people who were attacking you—that your artists were recording all Feather songs?

Oh yeah. That's why I started using pseudonyms. That's why it was so funny when I did an *Esquire* All American session and used my own name on a couple of tunes. It didn't get terribly well reviewed. The following year, I didn't use my name, I used pseudonyms. The *Down Beat* review said the second session was much, much better than the previous year's—none of the tunes were written or arranged by Leonard Feather! Little did that critic know. If I had used pseudonyms the first time and not the second, he would have liked the first session. That was the kind of nonsense I had to put up with.

How widespread was the practice of cutting in—where a band leader or a publisher would stick his name on the songwriting credits?

It was almost universal. I was fairly fortunate because it only happened to me two or three times.

What would happen in those cases?

Sometimes they would add their name as composer, and if they were in a position of power, there was nothing you could do about it. Most of the band leaders owned publishing companies, and in many cases, they would put your piece in their company. Benny Goodman recorded a song I wrote with Fletcher Henderson, and it went into Benny Goodman's company. Jimmie Lunceford recorded a tune of mine, and that was in Lunceford's company. Charlie Barnet, Woody Herman . . . you know, on down the line. But very few of them actually put their names on as co-writers. Except for the Dinah Washington things, which wound up with Lionel Hampton's name on them. Lionel was not to blame for that, though. His wife, Gladys, was a very shrewd businesswoman. I went to court and finally got those songs back.

From experience, I knew that sessions with my name on them would get knocked or ignored by the critics, so I used pseudonyms.

Wasn't it a kind of sophisticated form of payola?

Right, right.

But the alternative was, "If you don't like it, we won't record your material."

Yeah, that's right, but what can you do? It was very difficult. I eventually learned enough about the business—with the help of Billy Moore, to whom the same thing had happened—to just insist that I would not give the tunes away. I eventually managed to get away with it, partly because a lot of the things were on my own sessions anyway. I don't think I can recall any occasion where there was an outright refusal to record something I wrote because I wouldn't give it to the publishing company.

Is that still going on much today?

Oh yeah, sure. I'm not that much involved in the recording industry today, but I'm sure it's still happening.

Let's change the subject a little bit here. After my interview with Bob Thiele, you wrote to tell me that it was

Photographs: Frank Driggs Collection

New York, 1949: George Shearing (at piano) and his quintet.

Radio, 1946: Feather (standing, left) and Red Norvo (standing, right) with Woody Herman.

Dinah Washington

Photograph: Michael Ochs Archives

you, not Bob, who first brought Duke and Louis Armstrong together in a recording studio.

Yes. I'm sure Bob Thiele didn't mean any harm by that. It probably never occurred to him that I had done that earlier, because he did it for a whole session, and I just did it for one tune. But, nevertheless, it was the first time. The reason I got them together was I was doing a lot of stuff for RCA, and the *Esquire* All Stars session was coming out. I realized that Louis and Duke were under contract to RCA at the time, so there were no legal problems in bringing them together. I asked Duke about it, and he was very congenial and agreed to come to the session and sit in. Louis said it was okay with him if Mr. [Joe] Glaser, his manager, said it was all right. It was a very happy situation. Duke played on "Long, Long Journey," and after that, Strayhorn played piano for the rest of the day.

They were two very different men.

Oh yeah. Duke was very sophisticated—a very suave man. Louis was very down-home. But both were beautiful talents. It was a thrilling session.

Let's talk about Ethel Waters.

I recorded her twice. Once for Continental, which was a company I did a lot of work for for a while, and then when I was putting together a blues album for RCA. She was a marvelous singer.

In fact, Milt Gabler told me he felt Billie Holiday took a lot from Ethel Waters.

Maybe. That's arguable. I'm not really sure about that, but she certainly had her own sound and her own phrasing. She had a wonderful way with certain songs, and she had a good accompaniment when she played.

Tell me about Lennie Tristano.

I studied with him for almost a year. I went out to his house on Long Island. He'd test my ears and play chords for me and say, "What was that?" It was very interesting. It was good for me. He was sort of a maverick. He was not be-bop, although he did have a lot of musicians associated with him who were sort of friendly with be-bop. But he had a different approach to harmony, and in fact to jazz as a whole. He made records for Capitol that they didn't release for many, many years. Everything was totally improvised. Lennie was really a nonconformist. He had

some incredibly advanced ideas. Those things he did for Capitol were the first-ever totally atonal, avant-garde, nontempo jazz recordings anywhere. That was almost 10 years before Cecil Taylor. The only time I produced Lennie was for this series of piano records I did for RCA—only two tunes, I forget what they were. Around that time, I also did a session with André Previn, who was 16 at the time. The same thing happened with him as with Dizzy. The result of my recording Andre for just a couple of numbers was that, a year later, he signed with RCA and recorded with them on a regular basis for a long time. André was a very talented young jazz musician. Extraordinary.

He moved away from all that.

Yeah, eventually. But he still occasionally plays jazz. Still can, if he wants to.

Did you ever consider working as a staff producer?

No. Funny thing you should mention that, because I was just looking at John Hammond's book last night, and I thought how lucky I was because every single record I have ever made, I made because I wanted to. My heart was in it. John Hammond has a fantastic track record, as you know. He discovered Billie Holiday, Count Basie, Bruce Springsteen, and so forth. But as a staff producer at Columbia, John Hammond had to record Lawrence Welk, he had to record Eddy Duchin, and he had to record Kate Smith! I mean, I was never involved in that kind of thing. I was never obliged to record somebody because they were under contract to the company I was working for. So I was really very, very lucky. I only produced records because *I* had the idea for the artist and the session. In many cases, I brought the artist to the company. Like I brought Sonny Rollins to MGM and recorded him there. I can't remember any occasion where somebody said, "Well, we got this guy and we want you to record him." I never signed up with a company. I never wanted to be a staff producer—except on a very limited scale, on a free-lance basis. I worked with a record company called National for a little while, and was supposedly, nominally, a staff producer. But even then I just did whatever I wanted, whatever turned me on—not just what I thought was commercial. You know, as it turned out, some of the things I did, pure music, turned out to be commercial anyway. That's the way a lot of the greatest things in jazz happened. Look at all John Hammond's discoveries.

Speaking of success, let's talk about your work with Dinah Washington. I guess you first recorded her for Keynote, wasn't it? Right after the recording ban?

Yeah. Keynote had just, I guess, signed with the union. About the same time, I went to them with the idea of recording this girl who had been with Lionel Hampton's orchestra. (Harry Lim also recorded for Keynote, because he produced his own sessions, which he paid for himself. You know, Harry financed all those sessions. The first date that Harry made was with Lester Young.) Anyhow, I took six guys out of Lionel's orchestra and went into the studio. I think it was the same studio I later recorded Sarah in. This was Christmas week, 1943. Well, during the session, Lionel Hampton showed up. I had not asked Lionel to do it, because I knew he was under contract with Decca, but he was very helpful. He walked in and said, "How's everything going?" He decided he wanted to sit in and play the drums. I said, "Lionel, you're under contract with Decca." He said, "No, no problem. Everything's all right." So, he sat in and played piano on one number—two-finger piano, you know—and drums on another. Keynote decided to put the record out under the title *Lionel Hampton Sextet with Dinah Washington*. Well, naturally, all hell broke loose—and understandably so. Lionel *was* under contract with Decca—maybe he didn't even realize it. His wife came into the picture, and the lawyers came into the picture. First Keynote said they would turn the masters over to Decca. Then they decided they'd just keep the records and take Lionel's name off the label. So they made a new label that just said, *Sextet with Dinah Washington*. By that time, though, nobody cared about Lionel. Well, I won't say they didn't care, but Lionel's name wasn't really necessary anymore because Dinah had been such a big hit. The moment the record came out, everybody was playing it. "Evil Gal Blues." It was a big thing for Dinah, and it got Keynote off to a very good start. That plus the session that Harry Lim was making. Lionel's own record company had not been taking advantage of her talents, so I recorded her. Lionel liked the idea, you know. He didn't disapprove or try to stop me. He thought it was great—go ahead. But the story has been distorted a lot. Do you remember that enormous Keynote album that came out last year? Dan Morgenstern got the facts a little confused on the liner notes for it. He said it was very smart of Leonard Feather to get Lionel Hampton to play on the session. Which is exactly the opposite of what happened. I would have had a vibraphone in the studio if I'd expected him to play. And it got me into all kinds of trouble that he did sit in on that recording session.

A staff producer has to record anyone who's under contract to the company. Every session I did, I did because I wanted to.

You and Dinah, strangely enough, seem to have been really on the same wavelength. The lyrics and the types of songs you were doing for her. . . .

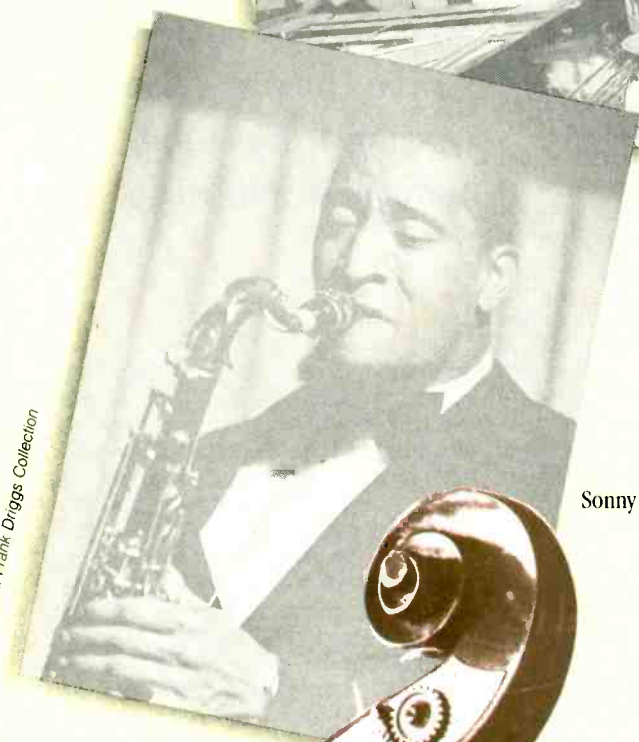
Yeah. You know the funny part is "Evil Gal" was not even written for her. It was written for the Hot Lips Page session. I just changed the lyrics and added a couple of topical things like "you lost your man to Uncle Sam." But it just seemed to fit her personality—she had that evil-girl manner—the same with "Salty Papa Blues." They just were right for her. And later on, "Blowtop Blues" was perfect for her. (That was done with Lionel.) Yeah, we were sort of on the same wavelength. Later on I did one that turned out to be the biggest of all, "Baby Get Lost." It was number one on the R&B chart, or whatever they called it in those days. I think it was R&B.

You know, it also seems kind of strange that an Englishman was writing all these lowdown blues.

Yeah. That's the last thing I heard her

Photograph: Michael Ochs Archives

André Previn (at piano).



Photograph: Frank Driggs Collection

Sonny Rollins

Photograph: Michael Ochs Archives

Charles Mingus

say—the last time I heard her perform, you know. She saw my wife and me walking into the club, Basin Street West. She had just started to sing "Blowtop Blues" as we walked in, and she said, "Do you believe a white man wrote this song?"

Now, speaking of that, you and legendary songwriter Doc Pomus worked together when he was just starting out.

Well, I just heard about Doc through the grapevine somehow. I knew that he was a crippled white guy who sang the blues. That was at the time when I had more or less carte blanche to record whatever—I think it was for Apollo records. And we made two of his blues and two of mine, with a very good little band. As it turned out, he didn't have any future as a singer, but he had a great future as a composer, and of course he's written I don't know how many big hits.

Let's talk about "How Blue Can You Get?"

That was very, very lucky. It started out with a record by Johnny Moore and the Three Blazers, which was recorded on RCA—not a session I produced. I think I just sent a copy of the song to Steve Sholes, and he gave it to the Blazers. Anyway, they made a nice record of it. Then a couple years later, Louis Jordan recorded it. I don't know whether I gave it to him, or if he heard the Three Blazers' record, but he made a very nice record of it. It turned out, many years later, that B. B. King, who was a great admirer of Louis Jordan and heard every record he made, took a liking to "How Blue Can You Get?" and began singing it. I knew nothing about this until one day I was at a friend's house, and I saw a B. B. King album, and "How Blue Can You Get?" was on it. I was astonished. This was like 12 or 13 years after the Louis Jordan album. I'd totally forgotten about the song. So B. B. King was in town sometime after that at a little club on the [Sunset] Strip, and I came up to him and introduced myself. I said I was the guy who wrote that song. He was totally astonished. I guess he'd never known anything about it. He'd just recorded a song by Louis Jordan. So that was extremely lucky because B. B. King sang that song every night for years and years and years—still does. He recorded it on *Live at the Regal*, which was one of

his really big albums. Then it was recorded again on an album called *Live at Cook County Jail*. By that time, there were two versions on the market by B. B. King—both big-sellers. Then he sang it in a movie, a terrible rock 'n' roll movie called "Medicine Ball Caravan." They put a sound-track album out with the music from that movie. So there were three B. B. King versions of "How Blue Can You Get?"

Let's talk about your relationship with George Shearing.

Well, George first came into a meeting of the No. 1 Rhythm Club in London, where I was speaking and playing records. You know, we had almost no American musicians coming to England, and we used to get together in clubs and play the new releases from the States. George sat in and played some boogie-woogie piano or whatever it was. He really impressed me, by the standards of those days, when there was almost nothing happening. I mean, he was extraordinary, just 19 years old. I immediately went to Decca, with whom I had recorded some English sessions, and suggested they do some sessions with George. One of the things I'll never live down is George played accordion and I played piano. Very badly, you know. But I had had a thing going with *Accordion Times* magazine—I said there was no such thing as jazz accordion. Then I heard George play, and I thought, "Well, I'm wrong. Let George record accordion. He plays fine." After that, he did some piano solos, and then there was a long gap. I was in New York and he was in London. He was very big in England. He had won the *Melody Maker* poll. Finally, he came to New York City, and a year later, he was playing at the Clique Club. He had a marvelous quartet. But Buddy DeFranco, who was in the quartet, was under contract to Capitol, so he was not allowed to make a recording date I had planned for the band. I thought of another instrumentation I had used a couple of times before, which was piano, guitar, bass, drums, and vibes. George said, "Well, that sounds like a good idea." So we did this Discovery recording session in 1949. By that time, George was beginning to get a little hot, and MGM was interested, but that was the first George Shearing quintet session. I didn't really get the actual sound of the quintet—the kind of blend that he developed later—but it was at least the beginning of the idea. It was nice, and my tunes for the Discovery session were quite good. George felt it was a nice group and he wanted to keep it together. So that's what happened.

You mentioned you also brought Sonny Rollins in to MGM.

MGM wanted, at one point, to really get going in a big way. I started a new label for them called MetroJazz, and I did Sonny's first big band date. We made half an album with the big band and half with only the trio. It was quite successful.

He was kind of unpredictable.

Yeah, he was. He just didn't show up for one session. I don't know to this day what happened, because I never brought it up and neither did he. I flew out to California. He had the musicians lined up. The MGM guy had the studio lined up. I went to the studio—the bass player was there, the drummer was there, and no Sonny. We waited and waited. Finally I had to take a taxi across town to wherever it was, and his wife, or a lady, came to the door and said, "I'm sorry, Sonny doesn't want to see anybody. He just doesn't feel like recording." So I went back to the studio, told the bass player and the drummer to forget it, and flew back to New York.

Was this before or after the famous bridge incident [when Rollins left the music business for a time and practiced nightly, alone, on New York City's Williamsburg Bridge]?

It was before. It was 1958, I think.

So he was probably going through a creative crisis.

He was going through some kind of trauma then, which I didn't know at the time.

Let's talk about Mingus.

[Laughter.] Ask my wife about that. My wife took the message when he called to say that he was dying of cancer so we'd better make the recording session in a hurry.

What happened? You know, this was what, 1960?

1960. Just a few months before I moved out to California. I had recorded him without any trouble at all on the Langston Hughes session. That album was a jazz and poetry album, and I

Charlie Mingus could do more just dictating a musical arrangement than a lot of people could writing one down. He was extraordinary.

used Mingus' quintet. I did it under the name of his pianist, Horace Parlan, because Mingus was under contract to Columbia. But it was really Mingus' quintet. He wrote the music for one side of the record, I wrote the music for the other side, and we got along fine—it was no problem. So I thought I would like to record his quintet instrumentally, and he said, "Well, would you mind if I used a couple of extra guys?" (This was for Mercury.) So five men became seven men, then seven men became 10 men. Then Mingus said, "Oh, Len, I've got these old arrangements that I really would like to do. It won't cost anything because they're already paid for." So, you know, it started getting a little alarming. I called Mercury and they didn't want it. Then Mingus really started getting very angry and hostile: "I've got to record this stuff." Then there came this day. . . . I was out, and he called and talked to my wife, Jane. He said, "Well, you know, I'm dying of cancer so these records are going to be very valuable and quite a coup for the company." Of course he wasn't dying of anything for about another 25 years or whatever. Anyway, to cut a long story short, I walked into the studio and there was a 21-piece orchestra with Gunther Schuller conducting. Mercury was understandably furious with me and with Mingus. I was powerless—what could I do? With somebody as big as Mingus, I couldn't punch him in the mouth. I couldn't stop him.

How could he hire all those people?

He just told them to come to the studio.

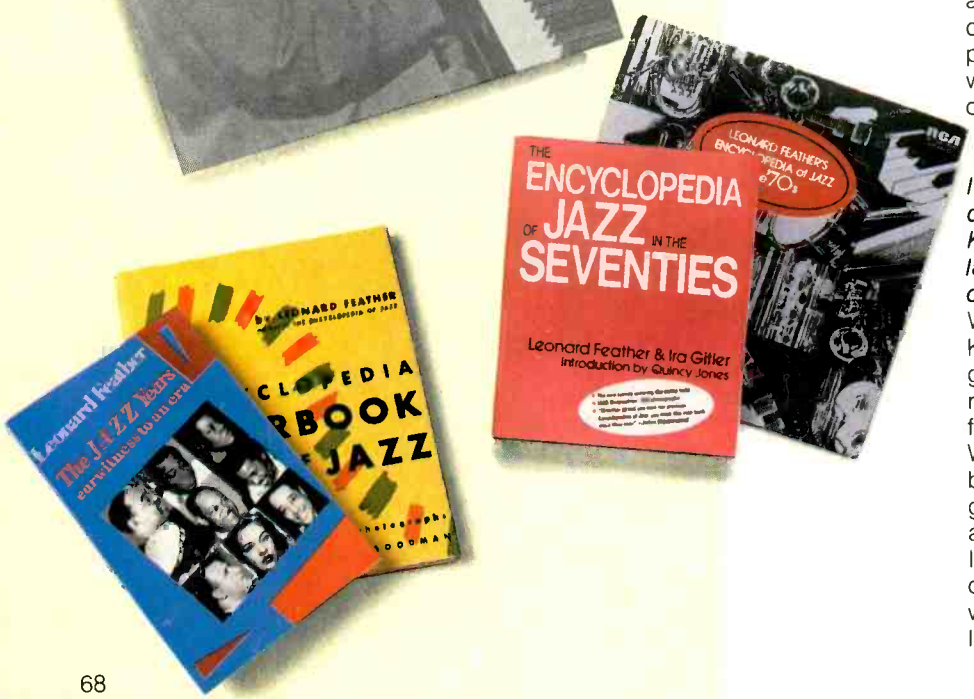
They didn't have contracts or anything?

See, people were careless about contracts in those days. You could go to a studio and make up the contract after the date, even though technically you

Photographs: Frank Driggs Collection

Radio, 1946: Benny Goodman was interviewed by WNEW's Peter Donald and a panel of critics including Feather (third from left) and writers from *Variety*, *Down Beat*, and *Metronome*.

1946: Lennie Tristano.



were supposed to have done it before. Well, it was a wild session, particularly the part with the full orchestra. But it was great, and it's been released time and again. It's now out on a CD called *Mingus Revisited*. (Previously, it was called *Pre-Bird*, because Mingus said that he was writing many arrangements before Charlie Parker's time.) Obviously they've gotten their money back. Oh, I forgot to tell you . . . after that story about the arrangements not costing anything, he put in bills to Mercury for thousands of dollars for the arrangements. But it all worked out, I think. History and hindsight tell me that I'm glad I produced the album, and I'm very glad that Mingus insisted on it—except that his manner of insisting was not the most desirable. Really, he made a nervous wreck out of me. That was the last thing I ever did with him, because I moved out to California not long after that and I very rarely saw him.

He was doing all kinds of stuff with all kinds of people.

Yeah. I think the highlight of his career was a little before that, when he was doing those things for Columbia. *Mingus Ah Um*, and so forth. He was not a terribly well-organized person, obviously. His music came out reflecting his personality, which was less than totally together. Nevertheless, he was a brilliant man. He could do more just dictating an arrangement than a lot of people could do by writing one down, which is quite extraordinary. I think you could say he was doing things that nobody else was doing at that time—in the late 1950s, definitely.

I want to ask you about somebody you don't hear much about, and that's Les Koenig, who owned the Contemporary label, which was really a hell of a little company.

Well, more should be heard about Koenig because he was one of the great men of the business, and I really regret losing him. We were very close friends. I did the eulogy at his funeral. When I first came out to California, he befriended me, very generously. He got me work at Contemporary Records and we became very close socially, so I was around him all the time. I found out he was a former movie producer who had been blacklisted—got into a lot of trouble. He had produced some

pretty well-known movies, though. In the meanwhile, he became interested in doing some recording. He started the Good Time Jazz label. From there, he went to the Contemporary label. By the time I had moved out here, in late 1960, he'd established Contemporary as a very important, modern jazz label. Koenig was a total perfectionist. Everything had to be exactly right. The recorded sound, the rapport among the musicians, the way the liner notes were written—he would watch every comma. And it reflected in the work that came out. There were some great albums. He was just a brilliant man who had a wonderful ear for the right things. He recorded Ornette Coleman before anybody else did—the first two albums—and went on doing other marvelous things. He recorded Phineas Newborn, some great Harold Land albums, and a whole bunch of other things. We were part of a sort of little social group that gathered together and listened to records once a week for a long time. He and this friend of mine Jimmy Tolbert, who's a lawyer, and George Shearing, who had moved out here, and a few others. Les was just an absolutely delightful, wonderful man with complete integrity. The kind that you very rarely find in a cutthroat business like the recording industry.

How did the blindfold tests begin?

Well, they really began as an outgrowth of the battle between the Modernists and the Moldy Figs. It seemed to me that the best way to show what musicians really felt about music would be to subject them to an experience where they listened to the music without any foreknowledge of what they were hearing, and then expressed their opinions. Obviously, they couldn't be accused of prejudice if they didn't know who it was they were listening to. So that's what happened. The first blindfold test was with Mary Lou Williams—in September 1946, I think it was. I played a Jelly Roll Morton tune, and she was violently negative about it, which infuriated the Moldy Figs. On the other hand, it was just an obvious reaction. Then I did some other people who were on the other side of the fence, like Mezz Mezzrow, who was this traditionalist clarinet player. I did one with Dave Tough, a great drummer, and quite a few other people, including Duke Ellington. Even Duke had one or two negative remarks to make. He called Babs Gonzales "desperately unadult."

Were you ever surprised about some of the responses you got on those tests?

Sometimes. I mean, I was always pleased when the responses were very down to earth, honest, and frank. Like Dinah Washington didn't care whose toes she stepped on. Neither did Miles Davis. I think I played an Eric Dolphy record, and Miles said, "Somebody should step on his toe." I did Miles three or four times, and he always came up with something, mostly negative. The same with Dinah.

Were you ever subjected to a blindfold test?

Oh yes. They got a whole bunch of critics to select one record each. I think Dan Morgenstern did the test with me. I was very cautious. I tried not to stick my neck out by doing a lot of guesswork, because I knew they would try to trick me. I just gave my opinions. The first thing I always said when I gave the tests, and I still do them occasionally, was that this is not a guessing game. Who you think it is is secondary. What you really think of the music is the primary subject under discussion. And, on that basis, we'd go ahead. I did get them to venture a guess if they wanted to, and also to give the music a rating. It's been very informative. I used some of the blindfold tests as sort of a chapter in each of *The Encyclopedia of Jazz* series, because a lot of them were interesting.

***Let's talk about* The Encyclopedia of Jazz.**

It came about because John Hammond came over to my house one evening, just him and his wife, and we talked about the fact that there wasn't a single reference book available on jazz. John, typically, said, "Well, I know just the guy to talk to." He called Horizon Press, and we had a meeting. They said there wasn't a need for a book like this, but we managed to talk them into it. We drew up a contract, and I hired Ira Gitler as my assistant and started work. It was a big success. The other books came out subsequently.

How did you do the research?

The hard way. By sending out questionnaires to everybody we could find.

The blindfold tests began because jazz musicians couldn't be accused of prejudice as long as they didn't know who they were listening to.

How did you know you were complete? That you hadn't forgotten anybody?

We just kept looking through *Down Beat* and any sources we could find, and checking our memories. We did leave some people out, I'm sure. At least it was a good start, though, and we caught up with them later on. We did the revised *Encyclopedia* in 1960. Then we did *The Encyclopedia of Jazz in the Sixties*, which came out in '67, and *The Encyclopedia of Jazz in the Seventies*, which came out in '76. That was the last one. I'm not sure if we'll do another. It was an awful lot of work. The book I most enjoyed writing was this last one, *The Jazz Years* . . . sitting down reminiscing, pulling out some of my old *L. A. Times* and *Down Beat* pieces.

So what's going on these days?

Last year, I produced my first CD—for Mainstream Records. They'd been inactive since Bob Shad died a couple years ago, and his widow is now reactivating it, Molly Shad. I found a wonderful group out here in Los Angeles—it's co-led by a valve trombonist named Mike Fahn and a pianist named Tad Weed, and features this incredible bass player named John Pattitucci. They have some original things and some other stuff from Miles Davis and a Coltrane thing. It's really a hell of a group. It's the first session I've produced in a couple of years, and it's not yet released. I've really been more or less inactive recently. I've been concentrating on other things—like I have a radio show and, of course, the *Los Angeles Times*—but I'm glad I've made my first effort in the CD area. I think these guys are fine musicians. You'll probably hear a lot more from them.

1

REVOX B260 FM TUNER

Manufacturer's Specifications
Usable Sensitivity: 10.8 dBf.
50-dB Quieting Sensitivity: Single-r.f. mode—13.2 dBf in mono, 34.8 dBf in stereo; double-r.f. mode—16.7 dBf in mono, 38.3 dBf in stereo.
Selectivity: Wide, 50 dB; narrow, 100 dB.
Frequency Response: 20 Hz to 15 kHz, ±0.5 dB.
S/N: Greater than 80 dB.
THD: Mono, less than 0.07% at 1 kHz.
Muting Threshold: 2.0 μV.
Stereo Threshold: 10 μV.
Auto Tuning Threshold: Distant, 4 μV; local, 100 μV.
Stereo Separation: 43 dB at 1 kHz; 15 dB in Blend 1; 7 dB in Blend 2.
Calibration Tone: 400 Hz at 40 kHz equivalent deviation.
Power Requirements: 120 V a.c., 50/60 Hz; 20 watts, 5 watts standby.
Dimensions: 17.7 in. W × 4.3 in. H × 13 in. D (45 cm × 10.9 cm × 33.2 cm).
Weight: 15.4 lbs. (7 kg).
Price: Tuner, $2,500; B208 remote control, $160.
Company Address: 1425 Elm Hill Pike, Nashville, Tenn. 37210.
For literature, circle No. 90

Photography: ©1988, Jay Brenner

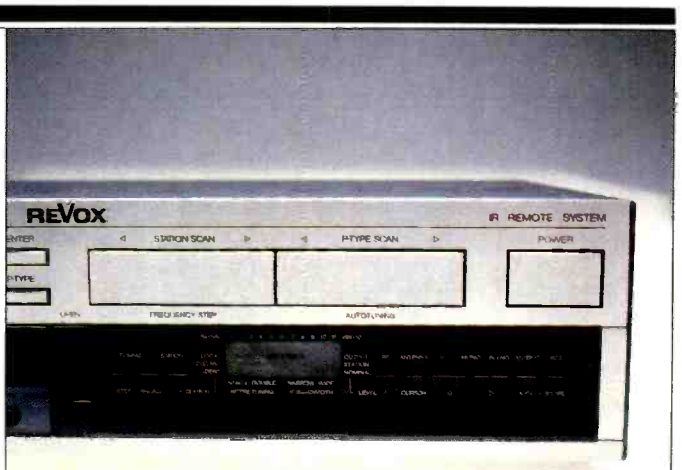
There aren't too many over-$2,500 FM tuners out there anymore. I'm told that the old Sequerra tuners, which sold for that much and more, are still being made, but the Marantz 10B that started it all is not. So when I came across one (old FM buff that I am), my first inclination was to try to determine if the price was justified. After all, FM reception quality is ultimately limited by FCC broadcast standards set more than 40 years ago and amended for stereo in 1961. You can't, for instance, receive audio frequencies above 15 kHz, and usable sensitivity is limited by the thermal noise floor of the antenna input impedance. So what makes a tuner like the Revox B260 worth $2,500? Plenty—but most of it has to do with convenience features and the tuner's ability to tailor reception specifically to the environment and signal conditions prevailing in your location.

Let's begin with some of the more innovative features. You can preset up to *60* stations. That may well be more than the number of presets that any other tuner can memorize, but as I see it, the real benefit is the ability to divide those memorized station frequencies into subgroups. Suppose you like jazz and classical but your spouse or roommate prefers soft rock and theater musicals. You could find all the stations that transmit your kind of music and store them under one subgroup heading, while the preferred stations of other household members could be stored under other subgroup headings. As many as nine subgroups can be organized and stored on the B260. Of course, all of the more conventional tuning modes are available, such as scanning (with brief auditioning as each usable signal is encountered), direct call-up of memorized stations, scanning within subgroups, and manual tuning. Another interesting feature is called "Auto Tune." It is a one-touch, initial setup programming system in which you need only tune in a station, touch one button, and the next available preset location is automatically assigned to the new station.

Besides station frequencies, the preset memories hold whatever settings you use to tailor the tuner's operation to your specific needs and preferences, so you don't have to go through all those switches and adjustments every time you call up the stations. Even the tuner's output level can be set separately for each station, so you can use the same volume setting whether you're listening to a quiet classical station or one of those stations which tries to be loudest on the dial by modulating up to (or beyond) the legal limits. Information can also be programmed about which of the B260's two antenna inputs should be selected for each preset station, as can the degree of stereo blend, i.f. bandwidth, and even r.f. sensitivity. There are two r.f. gain settings about 4 dB apart—just enough to make overly powerful stations, which might otherwise overload the front-end, usable again.

The B260 display area has provisions for entering the call letters associated with each of the station frequencies you memorize. Up to four characters can be memorized for each station. I haven't seen that on a tuner since Larry Schotz first introduced it on his memorable Micro/CPU 100 tuner design more than a decade ago, though some recent receivers also offer it.

Most home tuners let you switch to mono if stereo background noise or multipath interference becomes unbearable



The B260's control panel could be used to teach a course in human engineering.

for a given signal, and some tuners feature a blend position which reduces noise at the expense of some stereo separation. The B260 offers *two* blend settings. One maintains about 15 dB of separation across the entire audio spectrum (not just reduced separation at high audio frequencies). The other provides only minimal separation (about 7 dB) for those situations in which most tuners would have to be switched fully to monophonic mode to make the background noise level tolerable.

To assist the user in setting up proper audio output levels for recording, there's a built-in calibration tone. As with most tuners having this feature, the tone's output is at the average level of most reasonable FM stations, equivalent to 40-kHz signal deviation.

It goes without saying that, while these convenience features are all well and good, they alone wouldn't provide sufficient justification for the high price of this FM tuner—unless its sensitivity, selectivity, and other measured parameters were among the best available. Happily, they are, as you will see from my lab measurements and listening tests.

Control Layout

If I am ever asked to teach a course on industrial design and good human engineering, I think I will borrow a Revox B260 to illustrate how a tuner's front panel *should* be designed. To begin with, the B260's low-profile design matches that of Revox's recently introduced B250 integrated amplifier. Both units are about 1½ inches lower than earlier Revox audio components, and will soon be available in black with gold trim instead of the company's traditional gray and silver.

The B260's programming controls are placed behind a hinged, smoked-glass cover, completely separated from the main operating controls. There is little chance of a child (or even you) accidentally upsetting previously programmed settings.

When the power switch at the extreme right of the panel is pushed, the tuner is turned on and the last received station is reactivated. Two large rocker pads just to the left are used for changing stations; their functions and illuminated labels

The B260 stores not only frequencies, but call letters, station formats, and tuner settings for up to 60 stations.

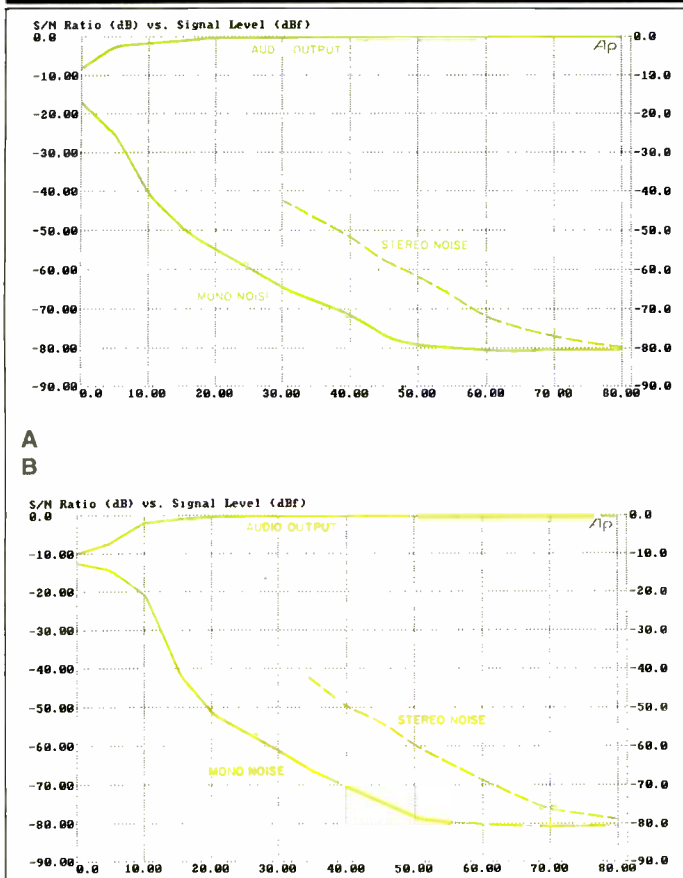


Fig. 1—Mono and stereo quieting characteristics, wide i.f. mode, for "Single r.f." (A) and "Double r.f." (B) settings.

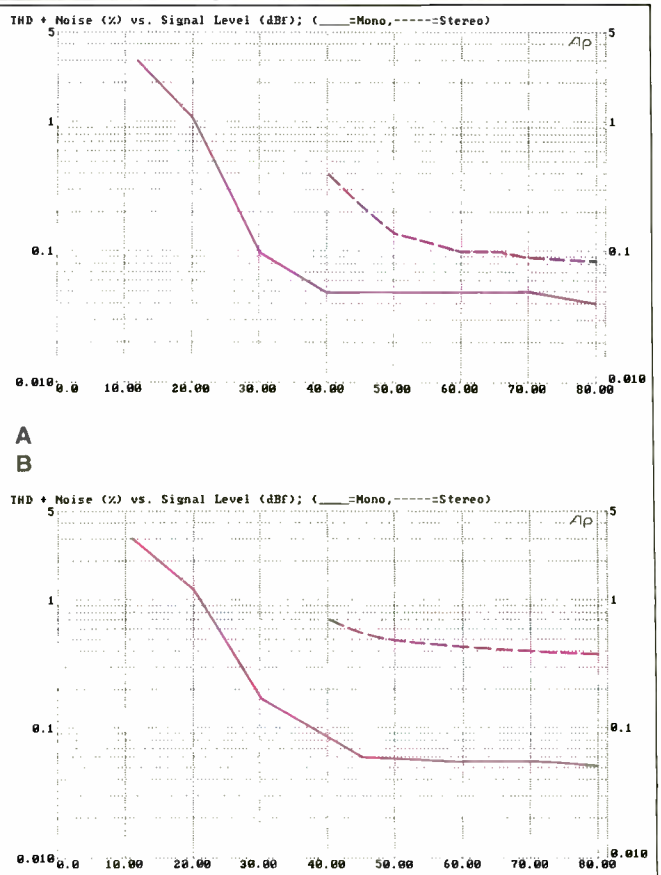


Fig. 2—THD + N vs. signal strength at 1 kHz for wide (A) and narrow (B) i.f. modes.

change according to the setting of two buttons ("Tuning" and "Station") behind the smoked-glass panel.

In "Station" mode, the two rockers scan the preset memories. The right-hand rocker (now "P-Type Scan") scans up or down through the station subgroup, while the left-hand rocker ("Station Scan") scans up or down through all 60 programmed station memories, regardless of subgroup.

When the B260 is in "Tuning" mode, the right-hand rocker's label becomes "Autotuning," and it activates the automatic station scan, ascending or descending. The other rocker becomes "Frequency Step," and is used for manual tuning in steps of 10 or 50 kHz, as determined by one of the secondary controls. That 10-kHz step feature is extremely useful if you suffer from adjacent-channel interference, since it enables you to tune slightly away from the interfering sidebands of the adjacent-channel transmission without detuning enough to introduce serious distortion.

Small pushbuttons labelled "P-Type" and "Enter" set up the mode for entering a subgroup identification and activate the input function after retrieval or programming of a station memory or a program subgroup. Ten numerical keys are arranged across the upper left of the panel, along with a larger rocker labelled "Display." Pushing this pad changes part of the display area below, which can be cycled through to read station call letters, tuned-to frequency, or both. (Station memory number and program subgroup number are always displayed.) A stereo indicator light is also part of this display, which occupies nearly the entire lower-left quarter of the panel.

The secondary controls referred to earlier are under the smoked-glass cover, which swings smoothly down and out of the way after a pushbutton labelled "Open" is depressed. At the same time, a small secondary display, only dimly visible when the cover is up, becomes clearly visible amidst an array of secondary pushbuttons. A "Step" button selects 10- or 50-kHz frequency increments when you are in the manual tuning mode, which is selected by pressing the nearby "Tuning" button. Pressing the "Station" button, or closing the hinged lid, cancels the manual tuning mode. The "Recall" button restores the previously tuned frequency. A


14
66
79

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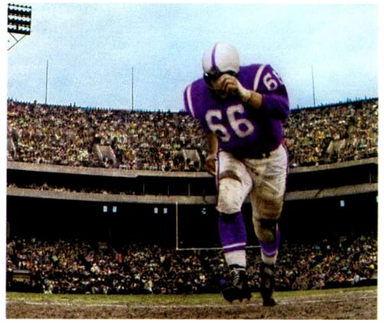

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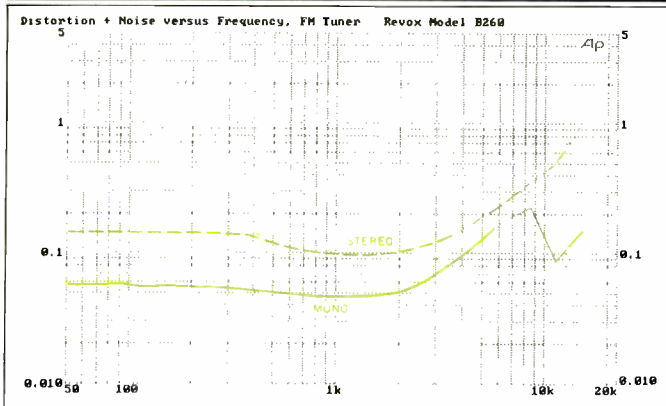
This tuner offers some unusual choices, such as two levels of stereo blend and r.f. gain.



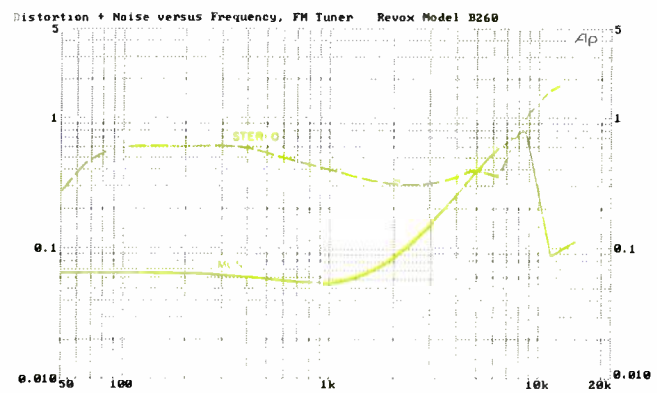
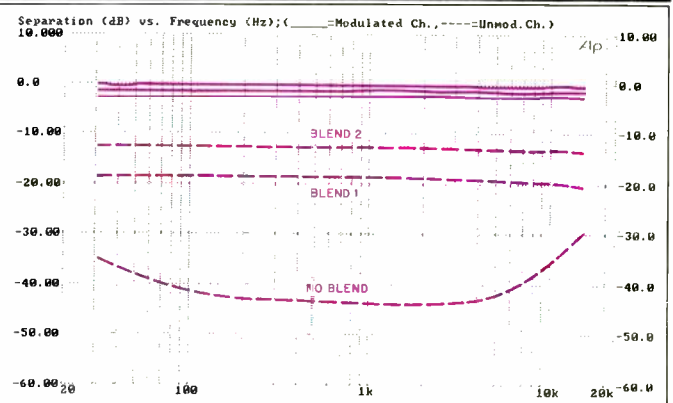


Fig. 3—THD + N vs. modulating frequency for wide (A) and narrow (B) i.f. modes.



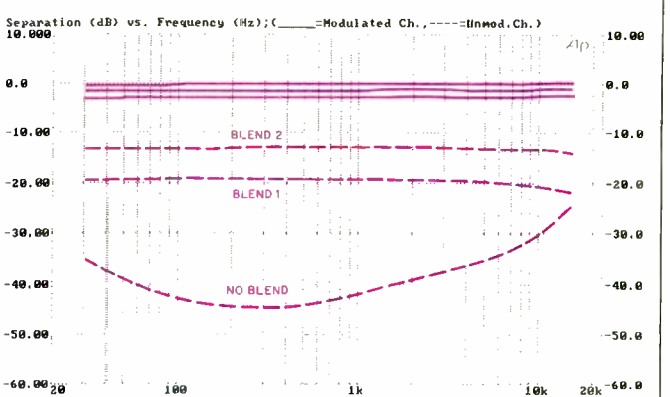


Fig. 4—FM frequency response (solid curves) and separation vs. frequency (dashed curves) for wide (A) and narrow (B) i.f. modes. Note the two blend levels. Solid curves are output with (top to bottom) no blend, Blend 1, and Blend 2.

button labelled "Search" determines the signal-strength threshold that will apply during automatic tuning or scanning. Other small buttons select the antenna input desired, r.f. gain selection (local or distant), i.f. bandwidth, mono or stereo reception, stereo blend levels, muting, and such additional functions as are required for the sophisticated programming modes featured in this tuner. Two of the remaining buttons are used to access alphanumeric characters for setting up station call letters or whatever label you choose to program in. The small illuminated display, which shows up in this area when the hinged cover is lowered, is a multifunctional display that shows signal strength, center tuning, muting, antenna, mono mode, high-blend mode, search mode, audio level, i.f. bandwidth, and r.f. mode.

The rear panel houses the two antenna inputs, stereo output jacks, and a pair of jacks intended for connection to an oscilloscope for checking multipath during antenna orientation. There's also a multipin connector for use with Revox's multiroom infrared control receiver or their programmable controller when integrating the tuner with other Revox audio components. An optional wireless remote, the Revox B208, can control all the tuner's main functions, except "Display," when the tuner is in "Station" (automatic tuning) mode.

Measurements

Both of the B260's antenna inputs have impedances of 75 ohms, but neither uses the "F-type" connector we are accustomed to. Revox supplied an appropriate adaptor (to which a coaxial cable could be wired) as well as a "splitter," in case you want to connect your TV antenna or cable feed to the tuner as well. I used the adaptor to connect my 50-ohm generator output to the 75-ohm inputs, and I took that slight impedance mismatch into account in those measurements where it would significantly affect the results. (Normally, I use my generator's 300-ohm output, but the B260 has no 300-ohm input, and transformers would cause excessive signal losses.)

Figures 1A and 1B are graphs of S/N ratio versus input signal level for the single-r.f. (distant) and double-r.f. (local)

"If I Had It To Do All O This Is Hc

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"Right," in this case, meaning a stereo system that allows the integration of speakers into a room in a way that's never before been possible.

Ensemble. The last loudspeaker of Henry Kloss.

Ensemble combines two bass units, two mid- to high-frequency units and something you won't find in any hi-fi store on earth.

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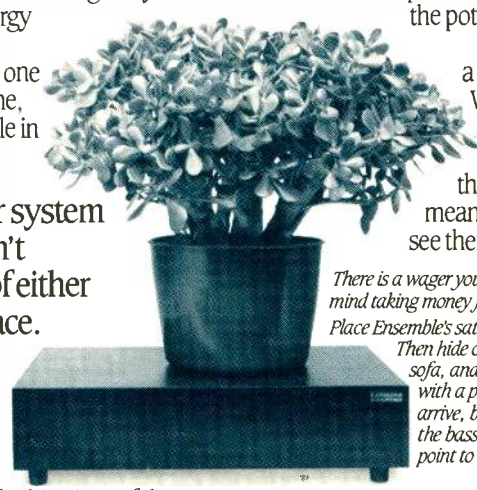

The first speaker system that doesn't cheat you out of either bass or space.

The fundamental octaves that so much of music is built on...

The almost sub-audible but palpable sounds generated by the big pipes of the organ, the bottom of the acoustic or electric bass, the low notes of the synth...

The frequencies completely ignored in the so-called "mini-speakers" now in vogue...

Ensemble provides them. With two dedicated, acoustic-suspension loudspeakers whose jobs are solely to reproduce the bottom two octaves of musical significance.

It is by design, not afterthought, that Ensemble comes with two, not one, bass units.

Because the human ear can't easily localize bass sound below about 150 Hz, there is no need in a home music system for the bass to emanate from the same source as the higher frequencies. (And many acoustical reasons why it shouldn't.)

So to take advantage of this basic but vastly overlooked fact, the bass units are built small enough to be placed where they'll produce the best sound, without visually overpowering your room.

They are a compact 12″ × 21″ × 4.5″. Yet they generate the low-frequency energy that would ordinarily require either a pair of very large conventional loudspeakers, or adding on a massive "subwoofer." Moreover, using two separate easily placed bass units dramatically reduces the creation of standing waves—the bane of pure hi-fi reproduction.

Without detriment to the sound, Ensemble's bass units can be placed beneath the couch, on top of the bookshelf, or under the potted plant.

And the result is a happy coincidence: Where the units sound the best is likely where they'll look the best. Even if that means not being able to see them at all.

There is a wager you can make, if you don't mind taking money from house guests. Place Ensemble's satellites where they're visible. Then hide one of the bass units under the sofa, and put the other on the floor with a plant on it. When your friends arrive, bet them to point out where the bass is coming from. They'll point to the satellites. Every time.

As for the other 8 octaves of music.

The rest of the sound spectrum, from a nominal crossover of 140 Hz, is reproduced by a stereo pair of two-way satellite units. Each incorporates a low-frequency driver, crossing over at 2,700 Hz to a direct-radiator tweeter that goes beyond audibility.

They are small enough (4″ × 5″ × 8″ high) to set the sound stage (or so-called "imaging") wherever you want it.

Finished in scratch-proof, gunmetal grey Nextel, they will look good for a lifetime.

What Henry Kloss tells his friends:

Every time I came out with a new speaker at AR, KLH, or Advent, my friends would ask me, "Henry, is it worth the extra money for me to trade up?" And every time I would answer, "No, what you've already got is still good enough."

But today, with the introduction of Ensemble, I tell them, "Perhaps now is the time to give your old speakers to the children."

Overcoming the fear of paying too little.

This is more difficult than it may sound.

Because the Ensemble System sells for an introductory price of only $499.

And it can be jarring to accept the notion that a product actually outperforms others costing several times more. But think back on Henry Kloss' track record with AR, KLH, and Advent, the best selling high-performance speakers of their decades...Our commercial success will come not from excessive prices

ver Again...And I Do... w I'd Do It."

Henry Kloss. Member of the Audio Hall of Fame. The creator of Acoustic Research in the 1950's, KLH in the 1960's, and Advent in the 1970's—the dominant speakers of their decades—now brings you Ensemble: the best-sounding speaker system of this era.

on a small number of sales, but from selling a lot of systems to a lot of people. You, perhaps, among them.

The second thing you must overcome is the misdirected notion that you must go to a dealer showroom and listen to the speakers.

Because the fact is, the *only* way to appreciate the astonishing sound reproduction of this unconventional system is to audition it in your own room environment. Therefore, we sell only factory-direct. Either by phone, by mail, or by our front door, to make it as easy as possible to get the speakers to your front door. They come with a straightforward 30-day money-back return policy.

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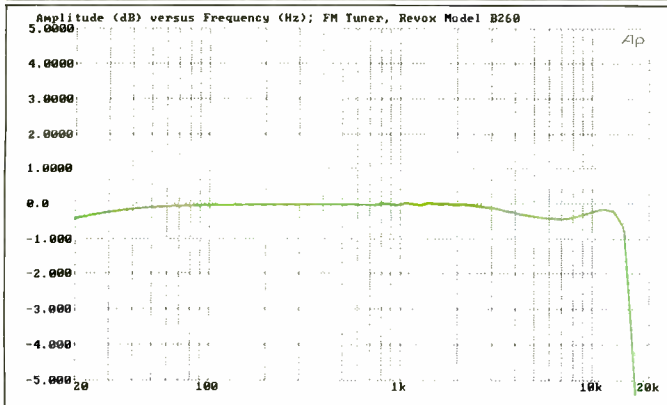

Fig. 5—Frequency response. Note vertical scale of 1 dB/div.

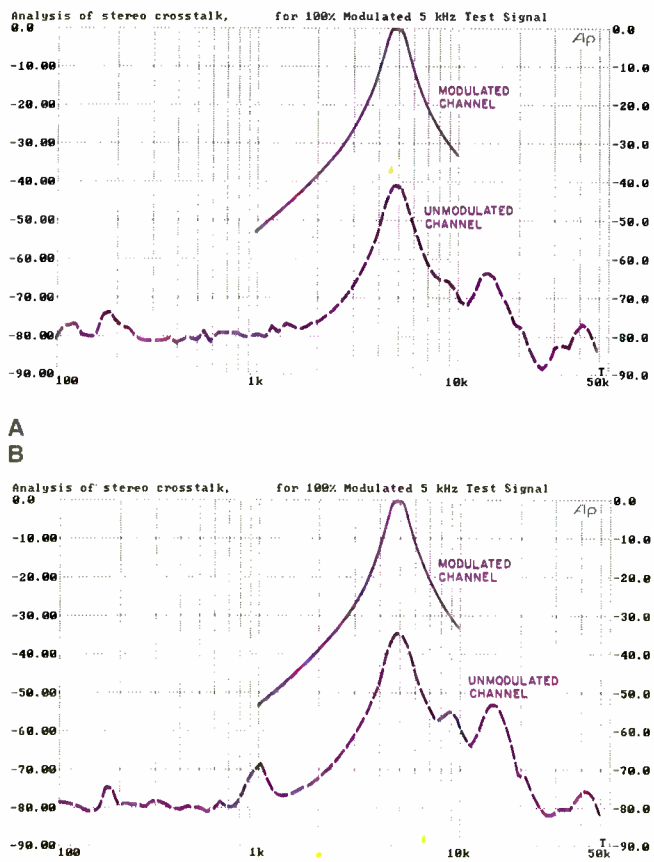

Fig. 6—Separation and crosstalk components for a 5-kHz modulating signal, plus subcarrier and sideband components, for wide (A) and narrow (B) i.f. modes.

modes, respectively. (Since there was virtually no difference in quieting characteristics between the wide and narrow i.f. modes, I did not deem it necessary to re-plot these graphs for the narrow mode.) The chief differences between the results of Figs. 1A and 1B can be seen at low input-signal levels. For the distant mode, 50-dB quieting in mono was achieved with an input signal of 14 dBf, whereas with the double-r.f. setting, it took nearly 20 dBf of signal strength to reach the same −50 dB noise level. The difference was less profound in stereo, since stereo quieting inherently requires far more input signal to reach a noise level of − 50 dB. In this case, it took exactly 38.0 dBf to reach that level of background noise using the distant setting, and 40 dBf in the local mode.

Figures 2A and 2B show how THD + N varied with signal strength. (For this and all further tests, I used the distant mode.) From these graphs, you can see that the 3% point (usable sensitivity) was reached at a signal level of between 11.0 and 13.0 dBf, depending on whether the narrow or wide i.f. mode was employed. On my sample, the stereo switching threshold was set higher than specified, so I could not measure performance in stereo at signal levels below 30 dBf (for S/N measurements) or 40 dBf (for THD + N measurements). At strong signal levels, where THD + N is primarily THD, distortion for a 1-kHz signal measured 0.05% in mono for the wide i.f. mode and 0.055% for the narrow mode. In stereo, THD reached a low point of about 0.09% in the wide mode and about 0.4% in the narrow mode.

Figures 3A and 3B show how THD + N varies with frequency. (The signal level used for these tests was 65 dBf.) Figure 3A gives results for the wide i.f. mode, while Fig. 3B illustrates the somewhat higher THD + N levels that result when the tuner is operated in the narrow mode.

Figures 4A and 4B show frequency response of a modulated stereo channel versus separation, measured at the output of the opposite, unmodulated stereo channel. (The dashed curves represent separation, measured in dB.) Figure 4A shows results obtained in the wide i.f. mode; Fig. 4B, the narrow i.f. mode. With either of the blend settings, separation remained virtually the same regardless of whether the tuner was set to the wide or narrow i.f. mode. Note, too, that the output from the modulated channel decreased a bit as I switched from no blend to Blend 1 and then to Blend 2. In measuring separation, therefore, I had to reference each separation curve to the appropriate solid-line curve with which it was associated. Thus, while separation in the Blend 1 setting appears to be about 19 dB, in reality it was more like 16 dB when referenced to its corresponding, modulated-output reference level (the lowest of the three solid curves). Similarly, separation in Blend 2 was actually about 11.5 dB, rather than what appears to be 13 dB.

In the no-blend mode, maximum separation at 1 kHz in the wide i.f. mode (Fig. 4A) measured 43.5 dB at 1 kHz, 41.2 dB at 100 Hz, and 36 dB at 10 kHz. Switching to the narrow i.f. mode (Fig. 4B), maximum separation decreased to 41.6 dB at 1 kHz and 30 dB at 10 kHz. Although the solid curves of Figs. 4A and 4B gave me a good idea of overall frequency response of the tuner, the vertical scale used in those graphs is so compressed that almost any tuner's response would look perfectly flat. I therefore reset my Audio Preci-

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- **Wooly Bully** Sam the Sham and the Pharaohs
- **A Lover's Concerto** The Toys
- **Hang On Sloopy** The McCoys
- **Help Me, Rhonda** The Beach Boys
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- **Just a Little** The Beau Brummels
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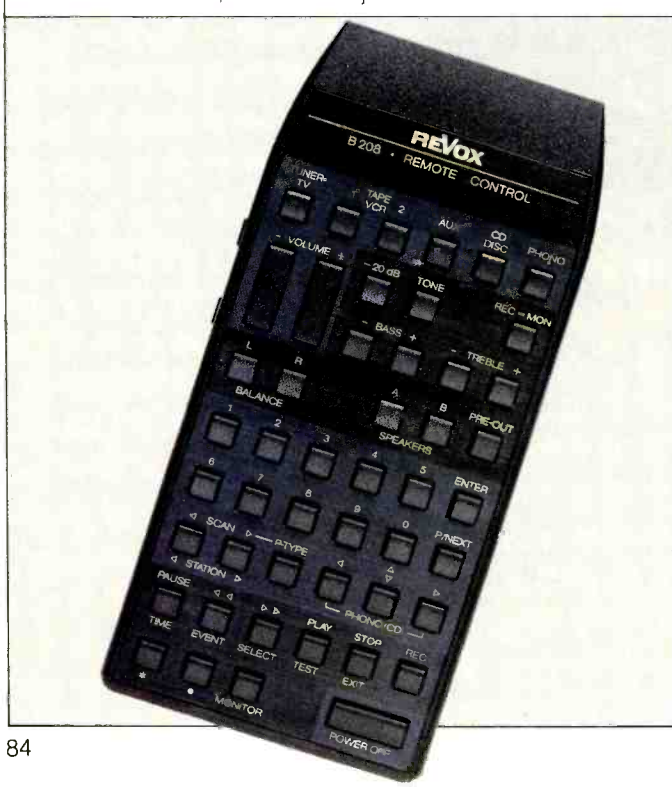
The switchable r.f. gain helped make strong stations more listenable, and the blend circuits did the same for weak ones.

sion test system to expand the vertical scale from 10 to 1 dB per division, and replotted the same measured frequency data; the results are shown in Fig. 5. Here you can see that the response does roll off just a bit at the low end (about −0.2 dB at 30 Hz). It also dips a bit at the high end (about −0.4 dB between 6 and 8 kHz) and rises again above 10 kHz before finally rolling off at around 15 kHz. Response was down about 0.7 dB at 15 kHz.

Since getting this new test gear, I have gradually abandoned my practice of photographing the screen of my spectrum analyzer 'scope to show separation and crosstalk for a 5-kHz signal modulating just one channel in the stereo mode. Now I can plot this information on an easy-to-read grid, as shown by Figs. 6A and 6B (wide and narrow i.f. modes, respectively). I believe that, despite the fact that the sweep is made using a somewhat wider bandpass filter than was used on my spectrum analyzer, results are clearer and easier to interpret. The plot is logarithmic and extends from 100 Hz to 50 kHz. The upper trace represents the desired 5-kHz output from the modulated channel. Its peak is set precisely at 0-dB amplitude, making it much easier to read the separation, which turned out to be just over 40 dB in the wide i.f. mode and almost exactly 35 dB in the narrow mode. More important, it is easy to see that, in the narrow i.f. mode (Fig. 6B), not only did the levels of second and third harmonic components (10 and 15 kHz) increase, but a spurious component can be seen at around 1 kHz. No such component is evident in the wide i.f. mode (Fig. 6A).

Capture ratio was highest in the narrow i.f. mode, measuring just under 1.0 dB. Alternate-channel selectivity measured 53 dB in the wide mode and greater than 100 dB in the narrow mode. Spurious-response and i.f. rejection also exceeded 100 dB, while AM rejection measured more than 60 dB. There was absolutely no evidence of spurious subcarrier frequency output when the tuner was operating in the stereo mode and input signals were in stereo. If such products were there, they were below the residual noise levels and, therefore, I could not read them. If you want to record FM programs from this tuner onto your cassette deck, you'll never have to sacrifice a few kHz of response by switching in your deck's MPX filter.



Use and Listening Tests

I began to fully appreciate the features of this remarkable tuner only when I started listening to some of my favorite stations. The classical music station I most enjoy is noted for its practice of keeping modulation levels very low to allow for sudden dynamic peaks, especially when playing CDs, without having to ride gain or use compressors excessively. But that has always meant that, when I switched from that station to my next most favorite stations (another classical one and a station specializing in jazz and early pop and rock), I usually had to run for the volume control on my preamplifier. Not with the Revox B260! I simply set the audio output level about 4 or 5 dB higher for my favorite low-modulating station. Now as I switch back and forth between stations, they all sound about equally loud.

In absolute terms, the Revox B260 was not the most sensitive tuner I've ever measured, but that didn't seem to reduce the number of usable signals I was able to pick up. In fact, I was even able to get a couple of local stations that I have traditionally not bothered to count in tuner reports because they usually caused unacceptable levels of r.f. intermodulation distortion. In the case of the Revox B260, I simply switched to the "Double r.f." setting (I wish they had called the two settings "Local" and "Distant" since that's what they really are, functionally) and reduced the r.f. gain enough to solve the problem. As for weak-signal stereo reception, I was really surprised to find how effective stereo can be with only a bit more than 10 dB of separation, providing that separation is uniform at all audio frequencies, as it is in the case of the Blend 2 setting. Trading off some separation in return for background noise that's almost as low as that heard in mono is worthwhile.

After completing all of my bench and listening tests, I managed to obtain Revox's separately sold B208 remote control. This multipurpose remote operates many other Revox components, including the B250 amplifier, B226 and B225 CD players, and B215 and B710 tape recorders. I was surprised to find that, although the unit is sold separately, Revox chose not to include the 9-V battery needed to operate it. In any event, after reading the operating instructions that accompanied the remote, I realized that this unit would be great to have if you owned an all-Revox component system, or at least a few other Revox components. For the tuner alone, however, it's a bit expensive.

The reputation that the Swiss have for craftsmanship is certainly confirmed by this tuner. Admittedly, you have to be a pretty serious FM-radio fan to spend the kind of money needed to purchase this elegantly styled and intelligently engineered tuner, but I suspect that there are enough such FM devotees out there to make the B260 the resounding success it deserves to be. *Leonard Feldman*

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". . . for seekers of the truth, the new design from Linn is one of the best speakers available under $2,000." — Andrew Marshall's Audio Ideas Guide on the Linn Nexus

"I felt I was getting much closer to the music than I had before. . . The Nexus is punchy, lively, dynamic and informative." — Hi-Fi Review on the Linn Nexus

"In short, there is more a sense of listening to music. . . than there was of listening to hi-fi." — Hi-Fi Review on the Linn Index

These quotes about Linn loudspeakers come from highly respected reviewers. We could literally fill this entire page with similar quotes (but then, so could any other manufacturer). Fortunately for us, it takes a lot more than a rave review to make a good speaker. It takes solid engineering.

Take the Linn Nexus, which was selected as "one of the most innovative consumer electronics products of 1988" by the Design and Engineering Exhibition in Chicago.

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The crossover is a fourth-order (24dB per octave) Linkwitz-Reilly phase coherent system based on research we did during the development of our standard-setting "Aktiv" electronic crossover. It is even housed in a separate, sealed enclosure to avoid microphonic distortions.

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See dealer list on page # 140

2

KENWOOD KDT-99R AM/FM-DAT CAR STEREO

Manufacturer's Specifications

FM Tuner Section

Usable Sensitivity: 12.0 dBf.
50-dB Quieting Sensitivity: Mono, 15.2 dBf.
S/N Ratio: 75 dB, IEC A-weighted.
Frequency Response: 30 Hz to 15 kHz, ±1 dB.
Alternate-Channel Selectivity: 80 dB.
Capture Ratio: 1.5 dB.
Image Rejection: 70 dB.
I.f. Rejection: 75 dB.
Stereo Separation: 40 dB at 1 kHz.

AM Tuner Section

Usable Sensitivity: 28 dBμ.

DAT Section

Sampling Frequency: 44.1 and 48 kHz.
Wow & Flutter: Below measurable limits.
Frequency Response: 10 Hz to 20 kHz, ±1 dB.
THD: 0.005% at 1 kHz.
S/N Ratio: 92 dB, IEC A-weighted.
Dynamic Range: 92 dB.

General Specifications

Operating Voltage: 14.4 V d.c. (11 to 16 V allowable).
Current Consumption (Play): 2.0 amperes.
Dimensions: 7 1/16 in. W x 1 15/16 in. H x 6 1/8 in. D (18 cm x 5 cm x 15.5 cm).
Weight: 5.7 lbs. (2.6 kg).
Price: $2,000.
Company Address: 2201 East Dominguez St., Long Beach, Cal. 90810.
For literature, circle No. 91

Kenwood is one of the first car-stereo manufacturers to actually sell a car-stereo head unit incorporating DAT playback capability. Because the KDT-99R (and similar units from other manufacturers) cannot record, there is no controversy surrounding their appearance in this country. Furthermore, although prerecorded DAT software is relatively scarce at the moment, the number of available DAT titles is increasing. Despite the apparent boycott by major record labels, smaller, more specialized recording companies are eagerly climbing aboard the DAT bandwagon and taking advantage of a golden opportunity to sell to people who crave prerecorded DAT tapes. And, of course, sooner or later, you will be able to buy a DAT recorder that will enable you to prepare your own DAT tapes for use in your car.

In designing the KDT-99R, Kenwood has managed to cram an amazing number of functions into a DIN-sized head end. The unit is divided into three separate chassis modules, only one of which, the main chassis, need be accessible to the driver or passenger after installation. This main chassis primarily contains the DAT circuitry and transport mechanism. The two additional modules contain the AM/FM tuner circuitry and the power supply. Most of the buttons and switches on the front panel serve at least two functions, one each in tape and in tuner mode.

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TO this end, Bryston has originated and optimized the circuitry used in all its products to a degree of linearity which approaches theoretical perfection. From steady-state signals, to high, low and mid-frequency transients we understand the mechanisms and criteria necessary for musical accuracy over the full spectrum.

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(802) 223-6159

DAT players such as the KDT-99R don't attract the opposition and controversy that have plagued DAT recorders in the U.S.

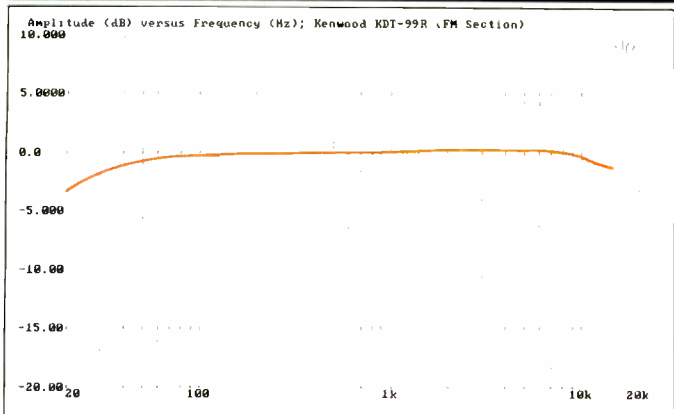

Fig. 1—Frequency response, FM section.

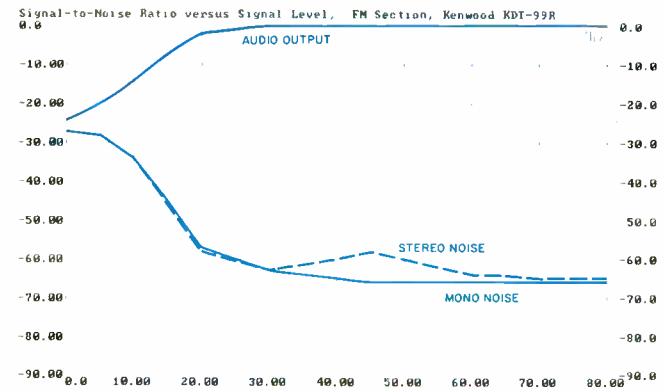

Fig. 2—Mono and stereo quieting characteristics.

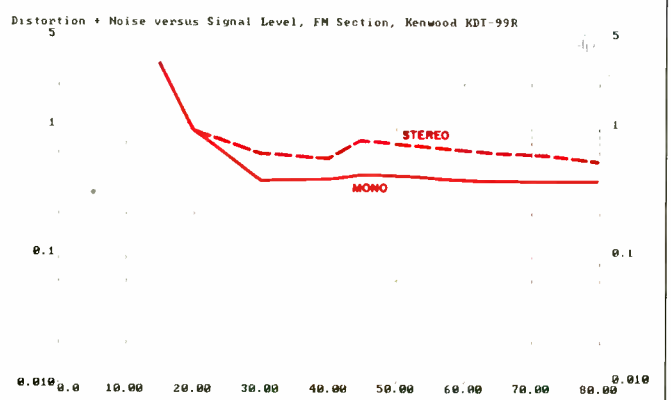

Fig. 3—THD + N vs. signal strength.

While there is only room for five station-preset buttons on the front panel, a dual-purpose secondary switch selects any one of three FM or one AM band settings for a total of 15 FM and five AM stations. The usual standard tuning features, such as auto ("Seek") and manual tuning, and even auto memory (automatic memorization of the first five stations found by the "Seek" circuit) are incorporated.

As for DAT playback functions, the Kenwood KDT-99R has taken advantage of most of the subcode features that are incorporated in the R-DAT standard. Specifically, there is a search function, by means of which you can quickly access any numbered selection in a DAT tape. Program numbers, two modes of time display (program or total playing time), and DAT tape status are all clearly indicated in the display area of the front panel, as are relative volume settings. An index-scan feature lets you listen to the first 15 seconds of each selection on a tape. Repeat play either of a single selection or of all selections on a tape requires only the push of single buttons. Even an indication of remaining tape time is provided. If there is a nonsignal section of a tape, the mechanism goes into the fast-forward mode until the next recorded section is found. At the end of tape playback, the tape is automatically rewound and ejected, unless the "repeat all" function is on.

Although the KDT-99R is equipped with standard bass and treble tone controls, a special pushbutton returns tone-control settings to their flat position, if desired, when listening to a DAT tape.

There are no play, pause, or stop buttons such as those found on home cassette and DAT recorders. If you want to stop DAT playback, the only way you can do it is to press the eject button. I found this a bit inconvenient in testing the unit, but I imagine that in a car the absence of those controls will not cause problems for the user. You can go directly from the playback mode to fast forward or fast rewind, and even to either direction of music search. As with most analog cassette players designed for cars, turning off the ignition key will also eject the tape.

Front Panel Layout

The flap covering the DAT tape insertion slot doubles as a secondary display, showing the direction in which a tape is fast winding, the relative amount of tape remaining, and which function you're affecting when you adjust the fader, bass, treble, or balance controls. A rocker switch at the left end of the panel is used for music search or, in the tuner mode, for seek tuning. Two buttons just below are used for fast winding the tape or for manual tuning. A long, horizontal bar labelled "Play/Band," found below the tape slot, is used to select one of the four tuner bands or, in DAT mode, to cancel a previously selected fast-forward, rewind, repeat, index-scan, or search command. Four tiny pushbuttons below this bar select bass, treble, balance, or fader functions. When one of these is pressed, the large up and down buttons just below, normally used to control volume level, then can be used to control the function just selected. An attenuator switch below the DAT tape slot reduces volume level by a fixed 20 dB.

The power/eject button is between the DAT slot and the large display area. Below the display are five preset buttons

"The opportunities presented by the T1000 were the most interesting of my entire career. For one thing, the tower shape was ideal for the three-way, four-driver system we had in mind. For another, since the T1000 was to be our top model, we had more design flexibility than with our other systems.

"For the best possible stereo imaging in real-world conditions, it's important to place the mid and high-frequency radiators at the ear level of a seated listener. The 42-inch height of the tower-shaped T1000 cabinet does this very effectively.

"Our best tweeter, the ferrofluid-cooled one-inch soft dome CFT 5, was perfect for the upper frequencies. A subtle but important touch: the tweeter is mounted flush with the baffle (not even a screw head projects). This insures that the smooth frequency response of the tweeter is not degraded by the effects of diffraction.

"The middle frequencies are most critical, because they contain the human voice—the range in which the ear is most discriminating. We kept this in mind when designing the new 6½-inch mid-frequency driver for the T1000. Among its special qualities: lower distortion than possible with smaller units, and the ability to deliver very high transient levels without the slightest strain. The internal frequency-dividing network uses this driver down to 300 Hz, to take full advantage of its strengths. To our knowledge, there isn't another mid-frequency speaker designed like it, or used like it.

"For the bass, we designed a new 8-inch woofer system, with a 1½-inch diameter long-throw voice coil operating in a high-flux magnetic field. Each T1000 uses two of these special drivers, each in its own subenclosure, for a total radiating surface equal to a 12-inch woofer. This dual woofer system delivers superior power handling capability and faster, tighter response than a single larger woofer.

"All the elements of the T1000 combine to provide uniform frequency response throughout the audible spectrum, with bass that is full, clean and solid, down to the lowest frequencies of musical interest.

"What's more, the T1000 occupies less than one square foot of floor space—less than most 'bookshelf' speakers require. And its tall and slender shape contrasts handsomely with the usual bulk of conventionally designed cabinets.

"To sum up, the T1000 is our best speaker system, and we believe it is the best speaker available for the serious music enthusiast. Ask to hear it at a Boston Acoustics dealer, and see if you agree."

Boston Acoustics

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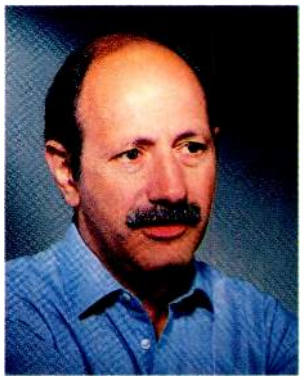

"There's more to the new T1000 than meets the eye... much more."

Andy Petite, chief designer, Boston Acoustics

The T1000 Series II. Available in hand-finished furniture-grade oak and walnut veneers, or black ebony vinyl veneer. Even the back is finished, allowing the cabinet to be placed where all four sides might be visible. The wiring connections are hidden beneath the cabinet to keep them inconspicuous. Dimensions: 42½ × 10¼ × 12⅛ inches (H × W × D).

To ensure optimum loading and balance of this three-way system with four active drivers, each of the two woofers and the midrange operate from their own sealed subenclosures.

ATHENA. The preamplifier is in many ways the most telling component in the audio chain. All too often technical absolutism results in sound quality that is sterile, unappealing, or aggressive. Yet bad lab performance almost always indicates poor sonic integrity. With Athena, Sumo demonstrates a new balance. A preamplifier that is both a stunning performer in the areas of quickness, linearity, and freedom from overload. Yet a warm, faithful, and exciting reproducer of music.

Athena represents the culmination of a major effort at Sumo. As such, it sets new standards for dynamic headroom and freedom from overload. Utilizing high voltage power supply rails, passively linearized circuitry, and a high current toroidal transformer, Athena can faithfully reproduce music at levels far in excess of the peak output of signal sources. As a result, compact discs display dynamic range without high end pain. And complex passages come through intact and unstrained.

Sonic purity in Athena is enhanced both by careful component selection and the exclusive use of pure Class A circuitry. Low noise 1% metal film resistors and metalized polypropylene capacitors are used throughout. Components are mounted on a military grade glass epoxy printed circuit board. And all external connections are made via gold plated input and output jacks. Further, a bypass function allows the user to totally remove the high level section of the preamp from the signal path. When selected, this provides both direct line-drive for high level sources (such as a CD player), as well as direct phono out.

At various times and for various products, we hear the words powerful, impactful, detailed, delicate, accurate, transparent, smooth, natural and a variety of other flattering adjectives. But one word is repeated more frequently than all the rest, and it is that for which we have strived above all. Musical. Athena is above all gloriously musical.

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The DAT playback section takes advantage of most R-DAT subcode features, such as program number, start, and time codes.

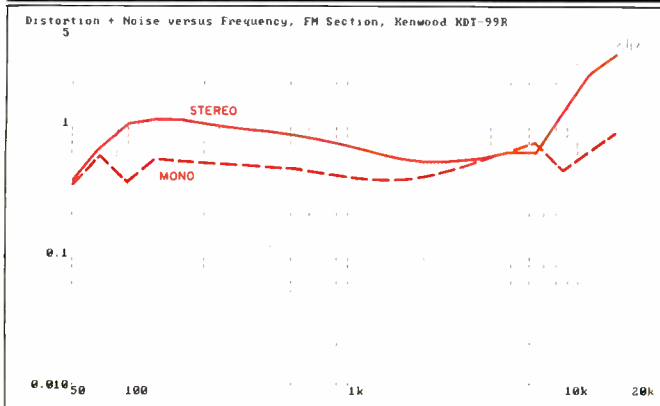

Fig. 4—THD + N vs. modulating frequency.

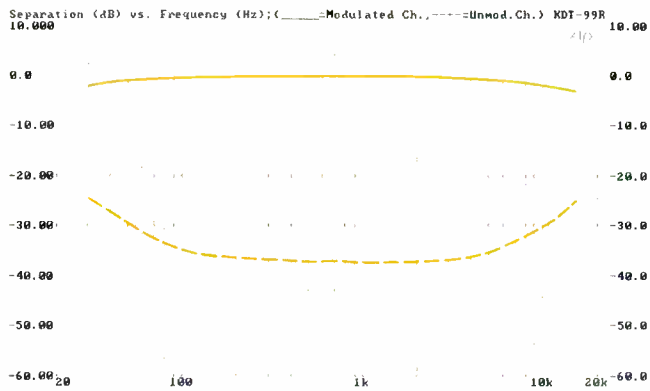

Fig. 5—FM frequency response and stereo separation. Note change of vertical scale from Fig. 1.

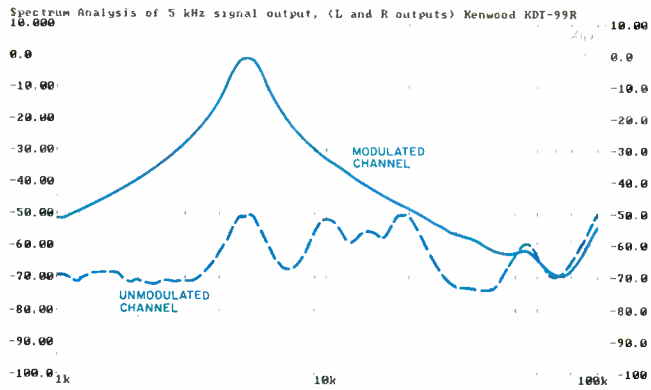

Fig. 6—Separation and crosstalk components for a 5-kHz modulating signal, plus subcarrier and sideband components.

that serve alternate functions when the unit is operating as a DAT player. In this mode, these buttons regulate repeat play, program number and music search, index scan, and DAT display. A small button to the left of the five presets serves either to restore flat response in DAT mode or as a memory switch to program preset frequencies in tuner mode. Finally, at the extreme lower right corner of the front panel, there is a tiny "Reset" button. This would only be pressed when initial installation has been completed or when replacing a dead car battery, and requires the use of something like a ball-point pen tip.

The KDT-99R comes with a wireless remote control. In order for any back-seat driver to use it, you must connect the cable from the remote sensor to a special receptacle dangling from the main unit.

Additional DIN connectors are provided for connection to front and rear power amplifiers. Only Kenwood amps will plug directly into these DIN connectors, but the manufacturer does sell accessory converter cords, with RCA plugs at one end, for use with other amplifiers.

There was no problem interconnecting the head unit with its tuner and power-supply modules, as the plugs and connectors for each were unique and could not be interchanged. The car antenna lead is connected to the tuner, so just in case the module is mounted at some distance from the incoming antenna transmission line, Kenwood supplies an extension cable with the standard 75-ohm plug at one end and the corresponding female 75-ohm jack at the other. Emanating from the KDT-99R's main chassis is a cable with a DIN connector labelled "AUX Input." This can be used to connect a separate analog cassette player or even a car CD player. Again, you'll need Kenwood's RCA-plug adaptors if you plan to use a cassette or CD player of another make.

Tuner Section Measurements

Frequency response of the FM-tuner section, operating in the mono mode, was down 2.0 dB at 30 Hz and 1.2 dB at 15 kHz. If you interpret ±1 dB to mean the same thing as +0, −2 dB, then I guess you could say that the FM section meets its published specifications with respect to frequency response. (A graph of these response characteristics is shown in Fig. 1.) Figure 2 is a plot of background noise and quieting as a function of signal input at the antenna. The lower, solid curve shows results for mono reception, while the dashed curve represents noise levels in stereo. Notice that below 45 dBf, the typical blending action common to most car-stereo FM tuners begins to take place, so that by the time signal strength is lowered to 30 dBf, the tuner is actually operating in mono, even when a stereo signal is present. (The uppermost solid curve represents the audio output level, with full level attained at signal strengths above about 20 dBf.) Best S/N for mono, at strong signal levels, measured 66 dB, while for stereo, S/N was almost as high, with readings of 65 dB. In mono, 50-dB quieting was obtained with a signal strength of about 16 dBf, which is very close to Kenwood's claims. Mono usable sensitivity for my sample measured 14.5 dBf.

Figure 3 shows how THD + N varied as a function of signal strength. Once again, at low signal levels, the stereo

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Area Code / Phone No. (To facilitate shipping)

Enter No. 7 on Reader Service Card

Most of the controls have different functions in tape and tuner modes, so the panel doesn't get too cluttered.

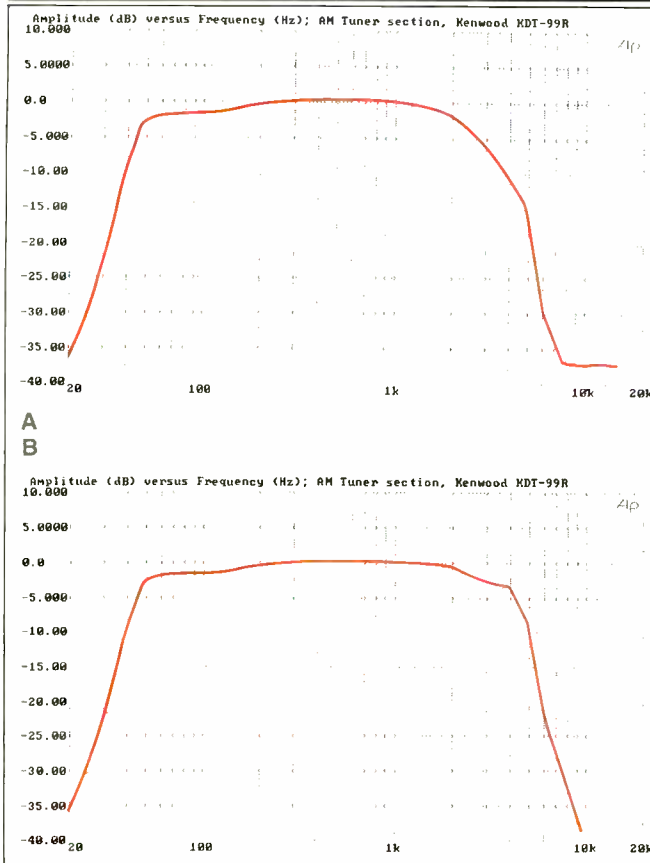

Fig. 7—AM frequency response for signals without pre-emphasis (A) and with NRSC pre-emphasis (B).

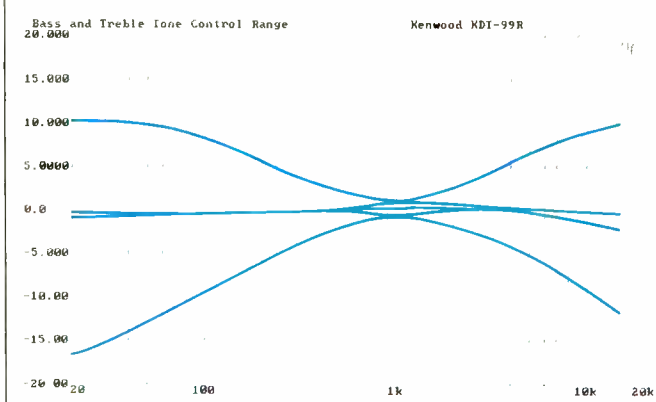

Fig. 8—Tone-control characteristics.

and mono curves became one because of the blending circuitry used to reduce background noise on weak stereo signals. At strong signal levels, THD + N for mono signals measured 0.38%, while for stereo signals, THD + N measured 0.6% at 65 dBf.

Figure 4 is a plot of THD + N versus modulating frequency, at a signal strength of 65 dBf. At 100 Hz, THD + N measured 0.43% for mono and 1.0% for stereo. At 6 kHz, mono THD + N was 0.7% while stereo THD + N was a bit lower, 0.6%. The sudden rise of apparent THD for stereo signals of frequencies above 7 kHz is caused by nonharmonically related beats between the harmonics of the modulating signals and the 19-kHz pilot carrier, rather than by actual harmonic products of the fundamental modulating signal.

Stereo separation fell short of the 40 dB claimed by Kenwood for a 1-kHz test signal but, as shown in Fig. 5, it did reach 37 dB at that frequency. As usual, separation decreased at the frequency extremes. At 100 Hz, stereo separation was 35 dB, while at 10 kHz, separation was a bit less than 30 dB.

Figure 6 shows a spectrum analysis of a 5-kHz signal, with only one stereo channel modulated. The solid curve shows the peak output at 5 kHz from the modulated channel and establishes a 0-dB reference point. The dashed curve shows some small output at 5 kHz from the opposite channel (indicating a separation of 50 dB). Other crosstalk products at 10 kHz (representing second-harmonic distortion), 15 kHz (third harmonic), 19 kHz (pilot carrier frequency), and 57 kHz (third harmonic of the 19-kHz pilot) are clearly evident. In case you are wondering how I could get a separation reading of 50 dB for a 5-kHz signal when, in Fig. 5, the apparent separation was less than 40 dB, the answer lies in these extraneous crosstalk products. Even though they are not at the modulating frequency (which in the case of Fig. 6 is 5 kHz), these extra components make the separation look worse than it really is in sweep tests such as the one in Fig. 5.

Alternate-channel selectivity measured exactly 80 dB, as claimed, while image and i.f. rejection were both better than claimed, with readings of 73 and 76 dB, respectively. At 45 dBf, capture ratio measured 1.3 dB.

The AM tuner's frequency response is plotted in Figs. 7A and 7B. For a signal without pre-emphasis (Fig. 7A), the signal was 6 dB down (referenced to 1 kHz) at 45 Hz and 3 kHz. With NRSC pre-emphasis (Fig. 7B), the −6 dB points were at 45 Hz and 4.7 kHz. The only other measurement I made for the AM section was usable sensitivity. Kenwood states this specification in dBμ, or dB relative to 1 μV. The 28 dBμ specified works out to be a signal strength of 25.1 μV. That's almost exactly what I measured for 20 dB of quieting with a 1-kHz AM signal at 30% modulation. Distortion of a strong AM signal at 30% modulation was 0.8%. Before putting the DAT player section through its paces, I checked out the action of the bass and treble tone controls. Their ranges of maximum cut and boost are plotted in Fig. 8.

DAT Player Measurements

During my most recent trip to Japan, I looked in vain for some standard DAT test tapes that might contain the sort of

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No car cassette player I know of has the flat response, clear out to 20 kHz, of this DAT.

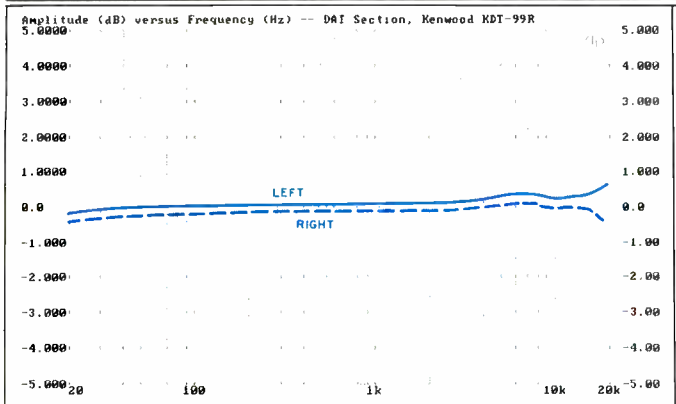

Fig. 9—Frequency response, DAT section.

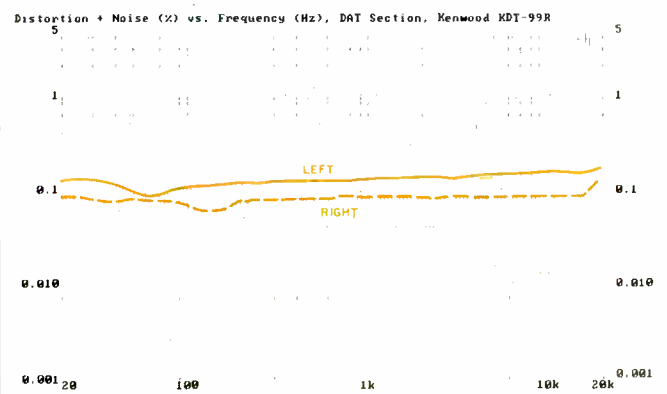

Fig. 10—THD + N vs. frequency.

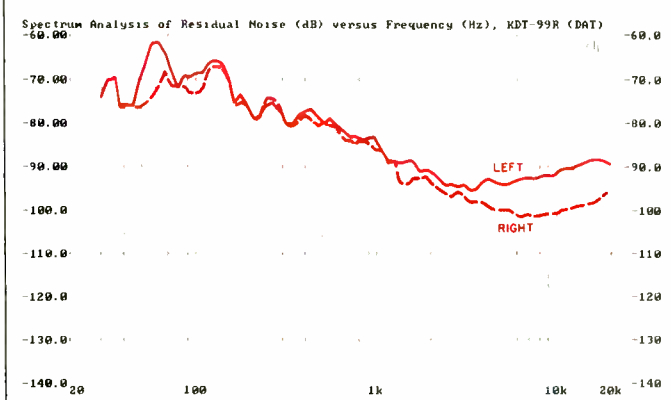

Fig. 11—Spectrum analysis of residual noise. The high levels at 60 Hz and its harmonics are due to the test-bench d.c. supply (see text).

prerecorded test signals I have on my CD test discs. Unfortunately, during my brief stay, I was unable to find such tapes, although I was led to believe that they do exist in Japan. Now you might be thinking that I could easily "dub" the signals from my test CDs onto DAT tape, but that wouldn't solve the problem. My home DAT player won't record "digital-to-digital," so any recording via the analog outputs of my reference CD player would still reflect any defects inherent in that player's analog stages and the analog input stages of my DAT recorder. The bottom line is that I had to use the two prerecorded DAT test tapes that I have been able to acquire in this country. They contain only a minimal amount of test signals, augmented by several musical selections. One of the tapes does contain a series of spot frequencies and, with that tape and my Audio Precision System One test setup, I was able to plot a very accurate frequency response curve for the KDT-99R's playback-only DAT section. Results are given in Fig. 9, which shows one of the clear advantages of a car DAT player over a car cassette player. No car cassette player I have ever measured (or heard about) yielded as flat response, clear out to 20 kHz, as did this DAT player. While THD + N as a function of frequency (Fig. 10) was generally lower than you would expect from even the very best car cassette player, it did not come close to the claimed value of 0.005%. I suspect that the reason for this is that I was measuring THD + N, and most of this combination consisted of residual noise caused by various ground loops created by my bench d.c. power supply. In fact, when I measured overall A-weighted S/N ratio for the DAT player section, I obtained a reading of only 71 dB.

The reason for this is further confirmed in the spectrum analysis of residual noise shown in Fig. 11. Here you can see that, above 1 kHz, the noise plot is consistently better than 90 dB below 0-dB recorded level. However, hum and buzz components related to the 60-Hz power-line frequency to which my d.c. supply was connected exhibit much higher noise levels (e.g. at 60, 120, 180, and even 240 Hz). I suspect that with a true d.c. supply, such as a car's battery, one would be unable to hear any residual noise.

I'm happy to see DAT players finding their way into cars, both from car manufacturers who are beginning to offer them as optional factory-installed equipment and from manufacturers such as Kenwood, Clarion, Blaupunkt, Alpine and others. Perhaps this is one audio technology that will become popular in automobiles before it becomes popular in the home. Perhaps too, if enough DAT players find their way into our cars, even the major record companies that are currently boycotting the format will realize that DAT offers a new source of profit. After all, those same record companies were just as dead set against cassette tape until they discovered that well-made, prerecorded cassette tapes could be a more important profit-maker than records and CDs combined. *Leonard Feldman*

User Report

As my new car is not yet adapted for testing car stereo equipment, I was not able to give the KDT-99R my usual road tests. I was able to fire it up at my desk, however, and check its human-engineering aspects.

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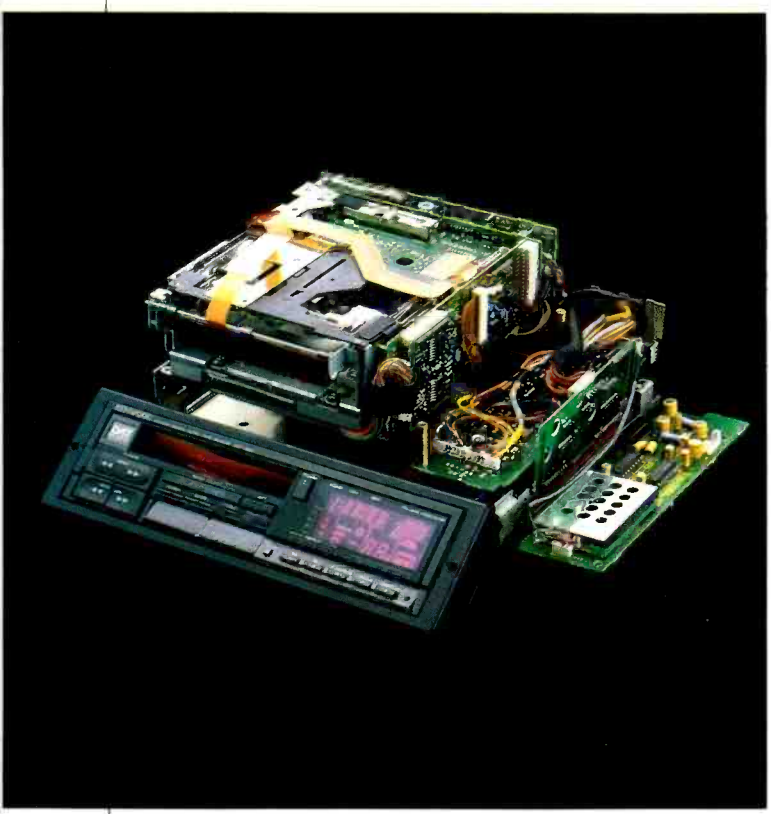
Fast forward and rewind are more than twice as fast as they are for conventional, analog cassette players.

When the unit is turned off, it's totally dark, which makes it a bit harder to find and turn on when driving at night. When it's switched on, first the DAT logo at the upper right and the attenuator button in the center glow. About two seconds later, the display, band indicator, and a line of lights on the tape door come on. There's no need for the tape door to illuminate before that, since trying to load a tape will not turn the unit on. The other buttons glow, too, but perhaps too softly to be seen easily, and because the lights in the preset station buttons are recessed, they're more visible to someone sitting on the car's center line than they are to the driver, unless the dashboard's radio slot happens to be angled toward him.

The display is easy to read in any light, though I would have preferred making the tuner-frequency/tape-time display larger than the digital volume-control indicator. There is an analog volume indicator, too, which changes for every 10 dB or so of level change (the digital indicator shows each 2-dB step), and starts showing red bars from −45 up to 0 dB. When the attenuator switch is pressed, the analog indicator flashes.

A tape symbol on the main display, and the line of lights on the cassette door, show when a tape is loaded but not playing. (This seems to occur only if you use the fast-search mode to back the tape up to its beginning; if you back it up with the fast-rewind button, the tape will eject once rewound.)

According to the manual, the word "Soft" is supposed to illuminate above the tape symbol when playing prerecorded software, but it failed to do so with either of the tapes I had on hand, or with one done on a home recorder.



The unit's designers tried to make multifunction buttons do similar jobs in DAT and tuner modes. Thus, the rocker which automatically finds stations for the tuner also automatically finds the next selection on a tape, while the buttons which are used for manual tuning also handle rewind and fast-forward.

The rocker, which you'll probably use more often when driving, sets out for easy access, while the two buttons below it are concave so you can tell them from the rocker by touch. The attenuator button is studded with tiny bumps, the "Play/Band" switch is long and thin, and the buttons which select other functions for the large volume controls are separated by easy-to-feel dividers. The memory-set button is small and set close to the panel, so you won't press it by accident. Only the station preset buttons struck me as a bit small and hard to find by touch—but they might prove easy to get used to.

The tape can be searched by program or by start ID codes, assuming that either or both have been recorded on it. Program search finds specific selections by program number (which can take a while if the programs are not in numerical order on the tape). Music search just counts up or down from the current track. The index scan feature only works forward and will not work if the tape lacks start ID codes.

The remote control could be very handy if you wanted to shift control to the back seat, or if the dashboard radio slot was not conveniently placed for the driver. It's an infrared system, with a compact transmitter just ⅝ in. H x 2 in. D x 3⅜ in. W (1.59 cm x 5.08 cm x 8.57 cm) that can be mounted with Velcro strips—even on the steering wheel, if you like. Small as the transmitter is, it duplicates the KDT-99R's most important functions: DAT up/down search and play, radio band and up/down seek, volume up/down, and the 20-dB attenuator. (The same remote system is used for some Kenwood cassette and CD players; a small switch on the back of the transmitter sets it to match the unit it's controlling.)

Without a car, an amp, or speakers, the main aspect of the KDT-99R's performance I could test was its tape-handling speed. Rewind and fast forward took about 80 S for a 120-minute tape, about 90 times actual speed. This is more than twice as fast as most in-dash analog players. In program-search mode, finding the sixth selection on a tape, about 27 minutes from that tape's start, took about 35 S. Neither figure is as breathtaking as I'd expect from DAT, but both figures are impressive.

The auto-memory function does not automatically enter the five strongest local stations into memory, as is usually the case with head units having this feature. Instead, it memorizes the first five reasonably strong stations it finds above the frequency to which it's set when this function is first activated. I prefer this, since it lets me seek out and memorize public-radio and college stations, usually at the bottom of the dial, which are most likely to have programs that I like.

The KDT-99R is a pleasure to use. I only wish I could have had the fun of testing it on the road. *Ivan Berger*

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3

YAMAHA CDX-1110U CD PLAYER

Manufacturer's Specifications
Frequency Response: 2 Hz to 20 kHz, ±0.3 dB.
De-emphasis Accuracy: ±0.3 dB.
THD + N: Less than 0.002% at 1 kHz.
S/N Ratio: 118 dB.
Dynamic Range: Greater than 100 dB.
Wow & Flutter: Below measurable limits.
Separation Between Channels: Greater than 100 dB at 1 kHz and 20 kHz.
Output Voltage: 2.0 V.
Headphone Output: 3.0 V, 150 ohms.
Programmable Tracks: 24.
D/A Conversion: 18-bit floating, with dual D/A converters.
Filters: "Hi-Bit" digital filter plus third-order analog filter.

Power Requirements: 120 V a.c., 60 Hz; 25 watts.
Dimensions: 17⅛ in. W × 4¾ in. H × 16⁷⁄₁₆ in. D (43.5 cm × 12.0 cm × 41.8 cm).
Weight: 31.2 lbs. (14.2 kg).
Price: $1,199.
Company Address: 6660 Orangethorpe Ave., Buena Park, Cal. 90620.
For literature, circle No. 92

Yamaha has come up with a new "flagship" Compact Disc player, the CDX-1110U, which incorporates advanced technology that we've seen before and some ideas appearing for the first time. While several CD-player makers now use true 18-bit D/A converters in their top models, Yamaha continues with their "Hi-Bit" quasi-18-bit technology. This system converts 16 bits of the digital filter's 18-bit output, but which 16 it reads depends on the signal's two most significant bits. When the uppermost bit is a one, the converter reads the signal's uppermost 16 bits. When the uppermost bit is a zero, the converter drops down one bit, to read the middle 16 bits. When the two uppermost bits are zeros, the converter reads the signal's lowest 16 bits. Since a 1-bit shift represents a 6-dB level change, the output circuit's gain is adjusted by 6 dB for each shift. (As with most premium Compact Disc players, twin D/A converters are used here.) There is a theoretical possibility of switching glitches with these gain adjustments, but in my tests of Yamaha's Hi-Bit players, I have never seen any evidence of this.

In this latest version of Hi-Bit technology, Yamaha has added eight-times oversampling, an approach that pushes the "clock" frequency (and surrounding modulation noise spectra) way out to a center frequency of 352.8 kHz. That, in turn, makes possible the use of an extremely gentle analog output filter. In fact, the use of eight-times oversampling permits the other major innovation found in the CDX-1110U: A pair of outputs that bypass any final analog filter altogether. As Yamaha puts it, you can decide for yourself (based on listening tests and preferences) whether you want to connect your amplifier to the "direct," unfiltered output jacks or to the conventional outputs that come after the three-pole analog output filters. As I found out during my lab tests, there are advantages and disadvantages to each of these approaches.

The CDX-1110U features a new three-beam laser pickup that utilizes a glass lens in a die-cast aluminum chassis. A newly designed, high-speed linear motor and an 8-bit microcomputer control the optical head feed. Access time to any point on the disc is less than 1 S. The player employs a shunt-regulated power supply. Optical and coaxial digital outputs are provided, in addition to the two sets of analog outputs already mentioned.

Another unusual feature of this CD player is its 20-bit, digital volume control which, since it operates in the digital domain, alters output levels in precise 0.4-dB steps without increasing noise at any level. A further advantage of having a volume control in the CD player is the ability to connect directly to a power amplifier, thereby keeping the overall signal path as short and direct as possible.

Additional convenience features include a 44-key wireless remote control, 24-track access via remote or front-panel keypad, 24-track random-access programming, random play, four-way repeat play, index search, three-way music search, selectable space insert (pause) between tracks, and an eight-digit fluorescent display that includes the now-familiar calendar display of available tracks on a disc. The CDX-1110U has a floating-suspension chassis to minimize interference or possible mistracking caused by external shock or vibration.

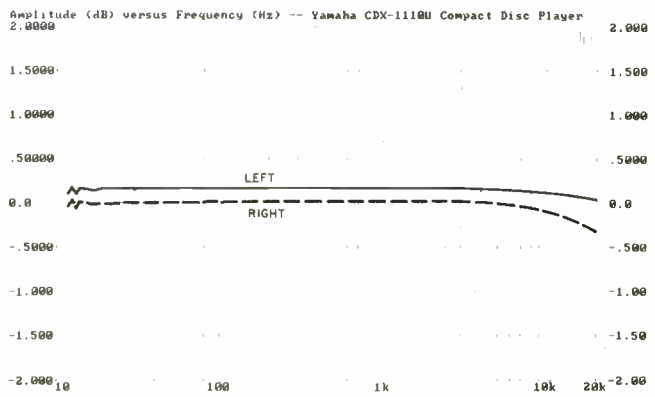

Fig. 1—Frequency response of left and right channels, using filtered output jacks. Curves have been separated for clarity.

Control Layout

The front-panel design of the CDX-1110U is fairly conventional. The now-familiar disc drawer is at the left. Below the drawer are the power on/off switch, buttons for "Space Insert," "Index," and "Random Play," two buttons associated with the various repeat-play functions, and three associated with random programming. (While it is possible to access index points within a given track directly, it is not possible to program specific index points. Only track numbers can be programmed.)

The large display window to the right of the disc drawer provides no less than 14 distinct indications: Disc, track, index, program number, three forms of time display (remaining, total time of disc, and elapsed time of track), play, search, output level, and music calendar are just some of the major items displayed here. Repeat-play mode, auto-space on, random play selection, and various programming functions and indications are also shown. As a user, you see exactly what the player is doing at all times.

To the right of the display window are "Up" and "Down" audio-level pushbuttons, "Time Display" button, the remote-control sensor window, and a stereo headphone jack. Below the display window are 11 numbered buttons (0 through 9 and a "+10" button used for selecting tracks whose numbers exceed 10). Below the number buttons are an "Open/Close" pushbutton for activating the disc drawer, "Play," "Pause/Stop," track advance and reverse buttons, and fast-forward and reverse buttons for audible search. Just about all of the operating controls including the volume adjustment and even the "Open/Close" drawer function are also found on the supplied wireless remote. I've never been able to figure out the purpose of putting the "Open/Close" function on a remote since, once I've opened the drawer remotely, I still have to approach the player to insert or remove a disc. But I guess having this feature on a remote control does no harm and probably adds only minimally to the cost of the total system.

Eight-times oversampling allows the CDX-1110U's analog filtration to be gentle—or even to be bypassed altogether.

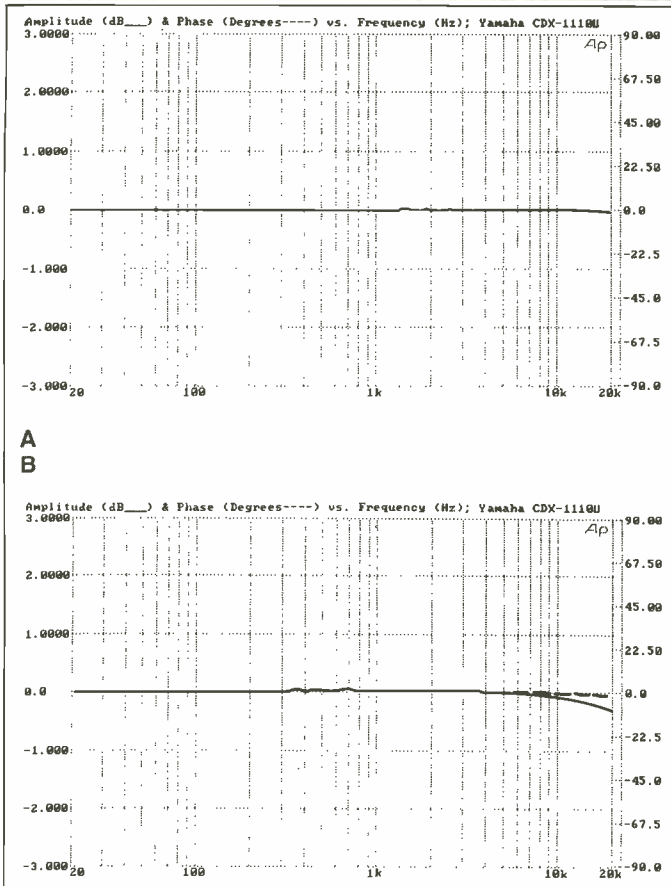

Fig. 2—Comparison between amplitude response of one channel (solid curve) and relative phase response (dashed curve) of opposite channel, for unfiltered (A) and filtered (B) outputs. Phase, in degrees, can be read from right-hand scale.

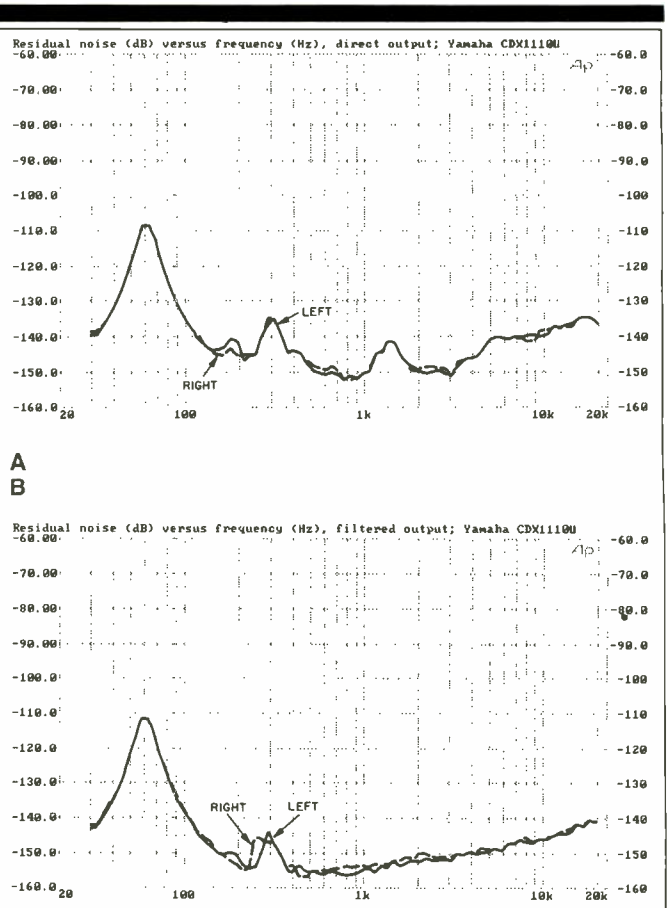

Fig. 3—Residual noise vs. frequency for "quiet" track of CD-1 test disc, using unfiltered (A) and filtered (B) outputs. Note rise in noise level at 60-Hz power-line frequency and its second harmonic.

The two pairs of analog line output jacks on the rear panel of this player are labelled "Direct" and "Filter." There are also coaxial and optical digital output terminals on the rear panel. In order to use either one, a slide switch labelled "Digital Out," also found on the rear panel, must be switched on. No optical cable is supplied by Yamaha, but these are now becoming readily available and are often packed with separate D/A converters or integrated amplifiers that have optical digital inputs. The type of optical terminal used on this CD player, as well as the optical cable that connects to it, have become standardized, so any optical cable will plug into this unit's optical output.

The Yamaha CDX-1110U is one of the heaviest CD players I have tested to date, weighing in at over 31 pounds. Much of this weight comes from the solidly built chassis and the shielding materials, not to mention the two, large power transformers, which I will discuss shortly.

Measurements

Figure 1 is the frequency response of the CDX-1110U, using the swept-frequency band of the EIA-approved CD-1 test disc produced by CBS Records. Response was plotted from 10 Hz to 20 kHz. The upper curve, representing the left-channel output, was deliberately displaced slightly from the 0-dB reference so that it could be examined separately from the response of the right channel. Left-channel response was down about 0.15 dB at 20 kHz, while right-channel response was off by about 0.3 dB at that same frequency. Yamaha specifies a tolerance of ±0.3 dB, so their claims for frequency response are met.

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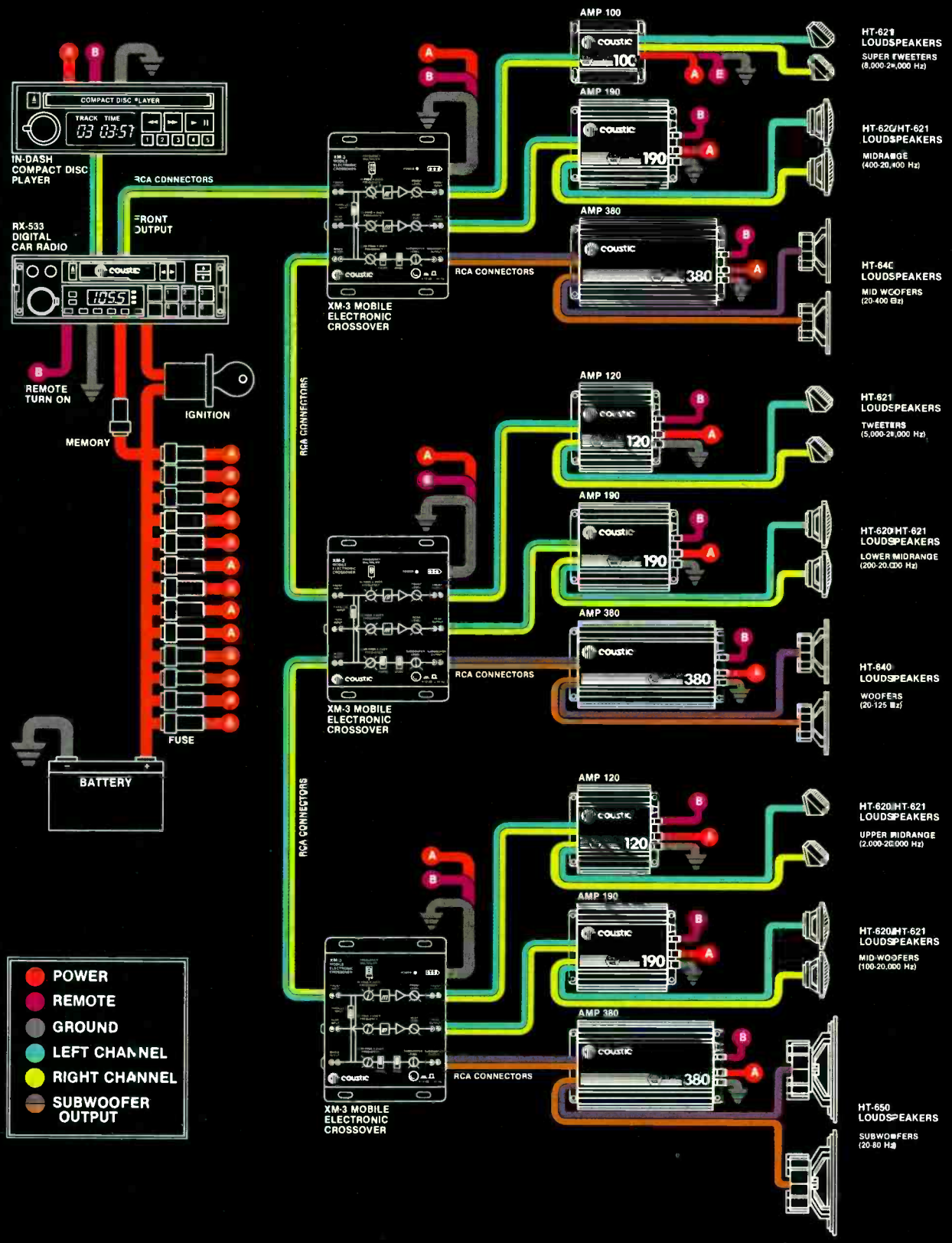

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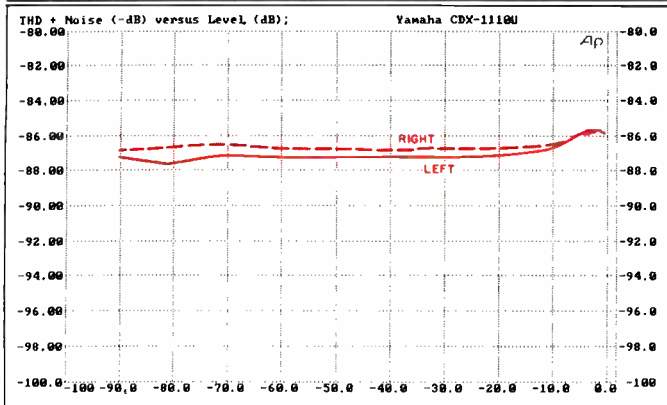
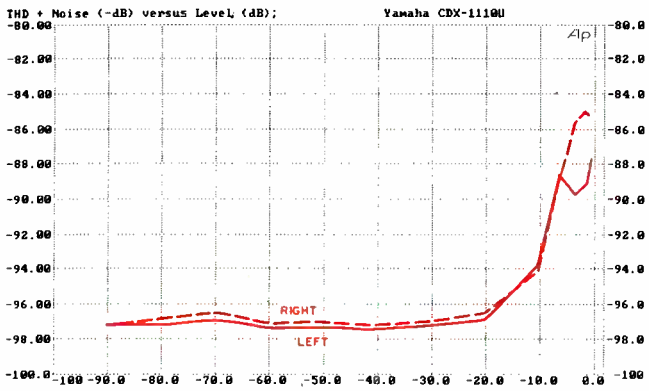


A



B

Fig. 4—THD + N vs. signal level for unfiltered (A) and filtered (B) outputs. Note shift of scale from Fig. 3.

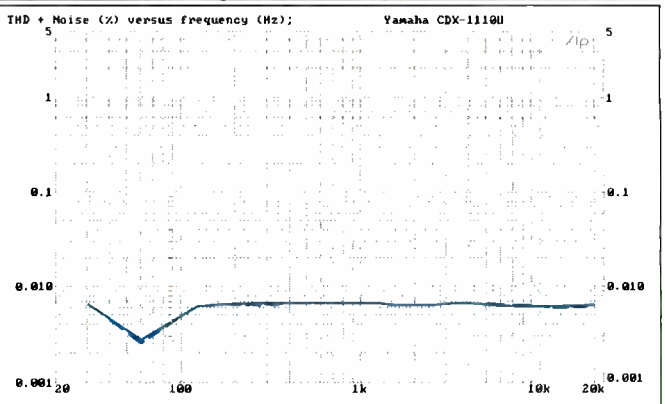


Fig. 5—THD + N vs. frequency. Results were virtually identical for both channels, whether measured from direct or filtered outputs.

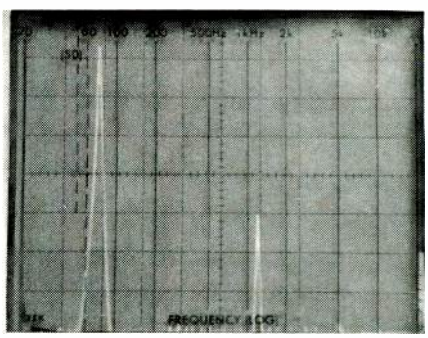


Fig. 6—Spectrum analysis of 20-kHz signal. Note that sweep is from 0 to *100* kHz, and that there are no nonharmonic beats. (See text.)

Interchannel phase response is plotted in Figs. 2A and 2B. I measured this parameter twice, first using the direct (unfiltered) output (Fig. 2A) and then the filtered output (Fig. 2B). Notice that in Fig. 2A, both frequency response and phase response are very nearly perfect, while the analog filter does have some influence on these parameters, gentle though it may be. Here, then, is one argument for connecting the outputs of this Compact Disc player via the direct output jacks.

On the other hand, results of my residual analog noise plots (Figs. 3A and 3B) seem to argue in favor of the filtered output connections. At all measured frequencies, noise levels were slightly higher when measured from the direct outputs (Fig. 3A) than the filtered outputs (Fig. 3B). Even the 60-Hz peak (attributable to the power-supply line frequency) was slightly higher (around −109 dB) in Fig. 3A than in Fig. 3B, where it shows up at about −112 dB.

Single-value overall measurements of S/N, using the same quiet track of the CD-1 test disc and an A-weighting filter, resulted in less of a difference between the two types of measurements: −103.5 dB for the unfiltered output and −103.7 dB for the filtered output. So, since the A-weighted curve approximates subjective audibility, don't expect to hear a difference in background noise when you switch from one set of outputs to the other.

Results shown in the graphs of Figs. 4A and 4B also favor the use of the filtered outputs, without question. Here I plotted so-called THD + N as a function of recorded level, referenced to maximum (0 dB) output levels. For the direct, unfiltered outputs (Fig. 4A), THD + N remained close to −87 dB over the entire amplitude range from 0 dB down to −90 dB. When I switched to the filtered outputs and replotted the graphs (Fig. 4B), THD + N was about the same at highest output levels but dropped way down to around −97 dB at lower recorded levels. From other observations concerning this CD player, I concluded that the only reason why the entire curve of Fig. 4B wasn't at about −97 dB was because the analog (post-D/A) stages had a tendency to show increasing levels of ordinary analog THD as signal levels approached maximum.

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The Sonic Hologram Generator in the Carver 4000t Preamplifier, C-1 Preamplifier and Carver Receiver 2000 solve this muddling of sound arrivals by creating a third set of sound arrivals. These special impulses cancel the objectionable second sound arrival, leaving only the original sound from each loudspeaker.

The result is a vast sound field extending not only wider than your speakers, but higher than your speakers as well. Sounds will occasionally even seem to come from behind you! It is as if a dense fog has lifted and you suddenly find yourself in the midst of the musical experience. Or, as the Senior Editor of a major electronics magazine put it, *"When the lights were turned out, we could almost have sworn we were in the presence of a live orchestra."*

IMAGINE THE POSSIBILITIES. Thanks to VHS and Beta Hi-Fi stereo soundtracks (found even on rental tapes), and the increasing number of stereo TV broadcasts, Sonic Holography can put you inside the video experience, too.

It's a breathtaking experience. Without the need for additional rear speakers, extra amplifiers or decoders, the visual experience is psychoacoustically expanded by lifelike sound that envelops you, transforming stereo from monochromatic flatness into vibrant three-dimensional reality. Instead of being at arm's length from the action, you are immersed in it.

Then there are the familiar audio sources which Carver innovation has further improved upon, each of which gains character and heightened impact through Sonic Holography.

Compact discs, whose potential is still trapped in the two-dimensionality of conventional stereo, are even more lifelike with Sonic Holography.

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ENHANCE YOUR SPATIAL AWARENESS WITH CARVER COMPONENTS. When considering the purchase of a new preamplifier or receiver, remember how much more you get from the Carver 4000t, C-1 and Receiver 2000. Or add Sonic Holography to your existing system with the C-9 add-on unit.

Each can transcend the limits of your listening (and viewing) experiences by adding the breathtaking, spine-tingling excitement that comes from being transported directly into the midst of audio-video reality.

Visit your nearest Carver dealer soon and expand your range of experiences with Sonic Holography.

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Only one or two other players reproduce low-level signals with linearity as nearly perfect as this.

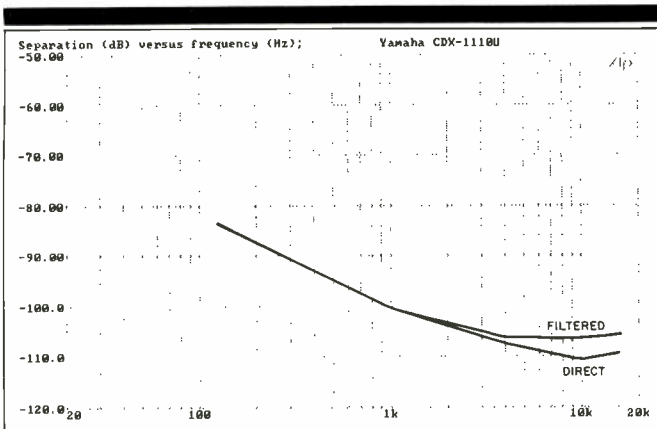


Fig. 7—Interchannel separation. Note the unusual slope and the increased high-frequency separation from the direct, unfiltered output. (See text.)

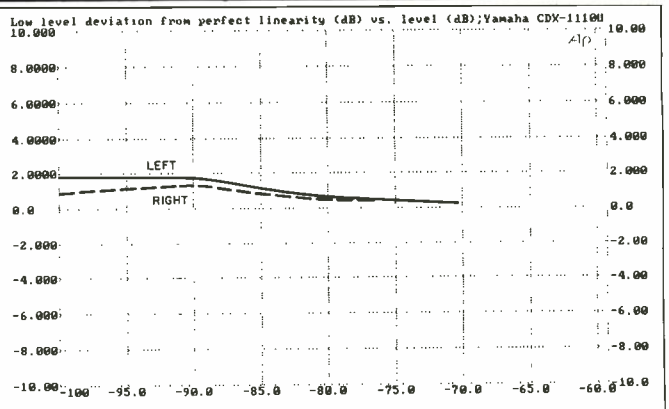


Fig. 9—Deviation from perfect linearity for dithered 1-kHz signal at levels from −100 to −70 dB.

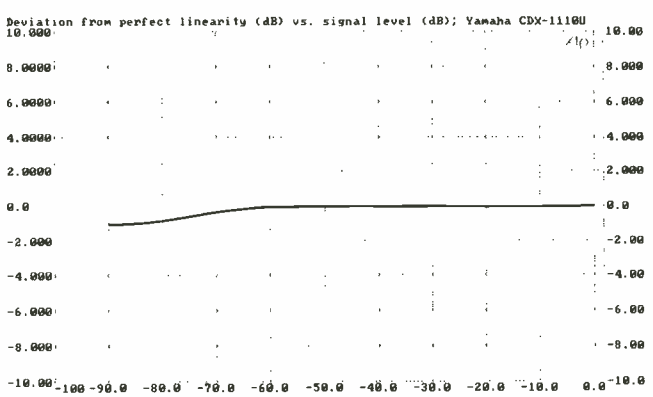


Fig. 8—Deviation from perfect linearity for undithered 1-kHz signal at levels from −90 to 0 dB. Deviation was virtually identical for both channels.

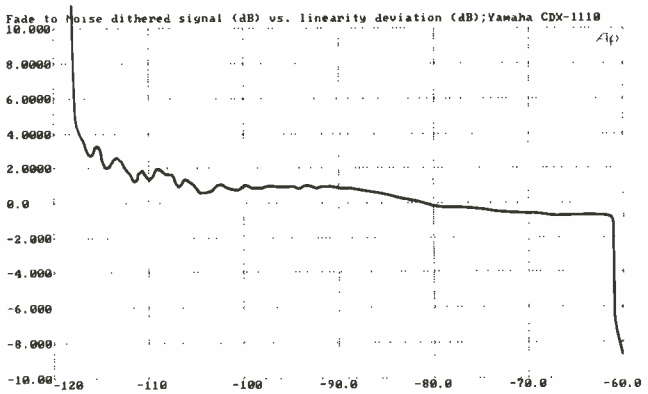
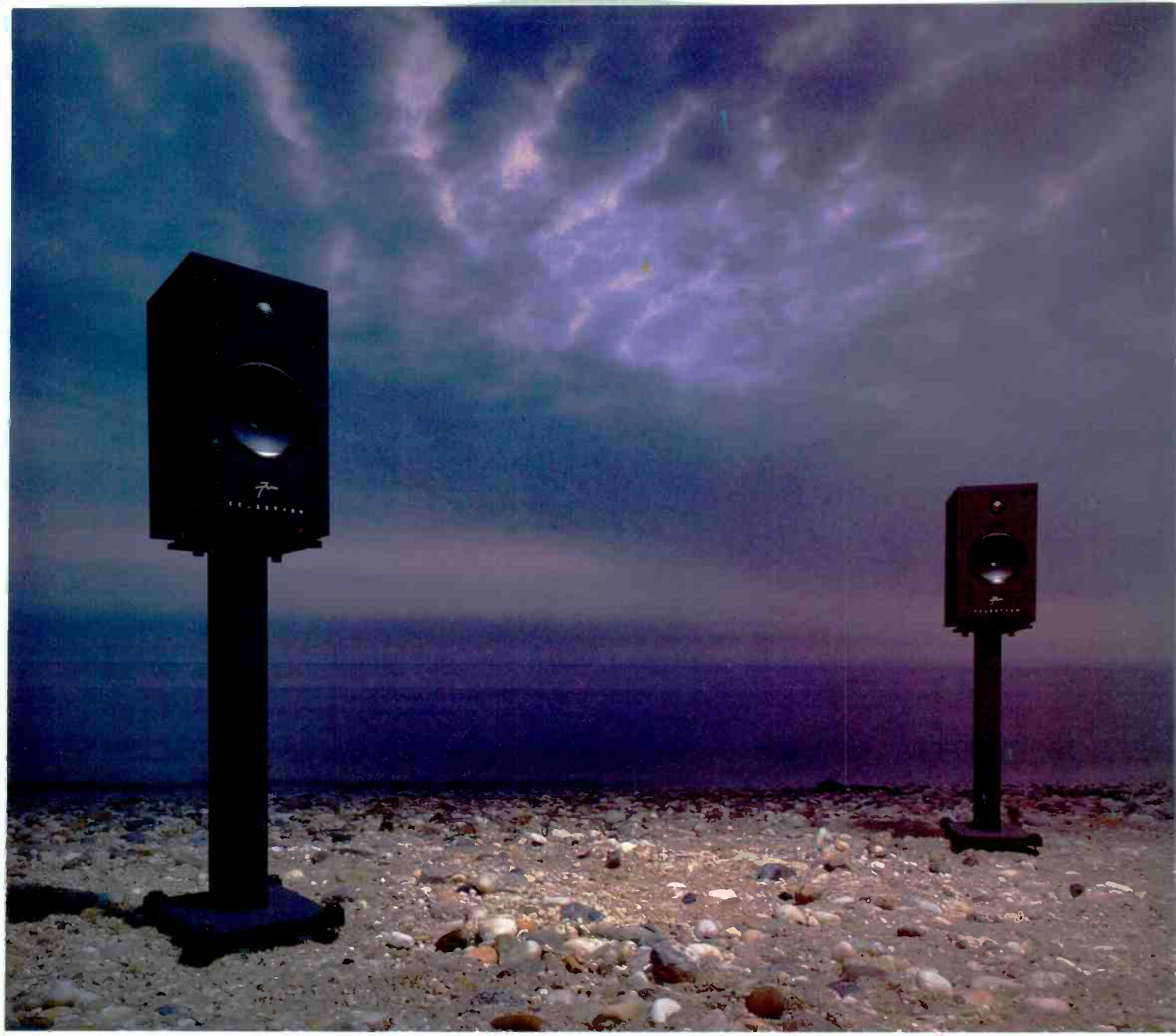


Fig. 10—Linearity deviation for EIA "Fade to Noise" dynamic-range test, using dithered signal.

Figure 5 shows how THD + N varied with frequency for signals at maximum recorded level. As mentioned above, there was little difference between results obtained via the unfiltered and filtered outputs, so I saw no purpose in presenting two separate graphs for this measurement. At 1 kHz, THD + N reads about 0.006%. Translated to dB, this works out to about 85 dB, which is in close agreement with results for maximum recorded level (Figs. 4A and 4B).

Single-value overall readings of SMPTE-IM distortion at maximum recorded level yielded readings of 0.0113% and 0.0086% for left- and right-channel unfiltered outputs, and almost identical readings of 0.0107% and 0.008% for left and right filtered outputs.

The benefits of properly designed digital filtering and eight-times oversampling are evident from the 'scope photo in Fig. 6. Had I confined the spectrum-analyzer sweep to my usual range of from 0 Hz to 50 kHz, all you would have seen is the desired 20-kHz tall "spike" at the left of the photo. Since better CD players such as this one (and a few others I've measured recently) show no spurious output products in the range from 0 Hz to 50 kHz, I decided to extend the linear sweep to 100 kHz, with each horizontal division now corresponding to 10 kHz. There are still no spurious outputs. The two shorter spikes evident at 60 and 100 kHz are simply the expected, inaudible, third- and fifth-harmonic distortion components of the desired 20-kHz signal. No other nonhar-



What Is The Meaning Of Life?

Many have pondered this weighty question, no one has found an answer that satisfies all.

At best, life is synonymous with what we know to be *real*, i.e. genuine, unaffected and natural. As life grows denser and more technologically complex, simplicity becomes more appealing.

The same applies to hifi. High end audio systems are now dedicated to the transparent reproduction of authentic, lifelike sound.

Unfortunately, too many of us remain impressed with massive speakers that produce a brutish and exaggerated "larger-than-life" sound.

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The difference between the filtered and direct outputs was most obvious in the THD + N measurements.

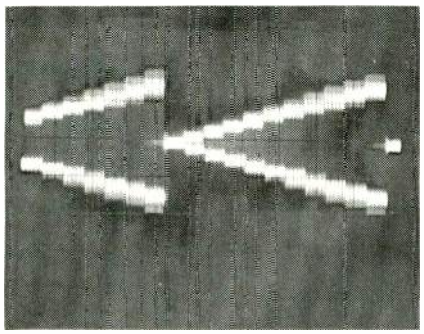

Fig. 11—Monotonicity test. Note excellent linearity at low signal levels.

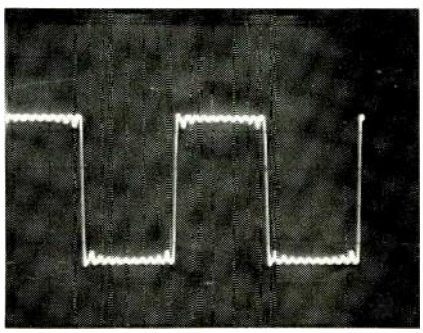

Fig. 12—Reproduction of 1-kHz square wave.

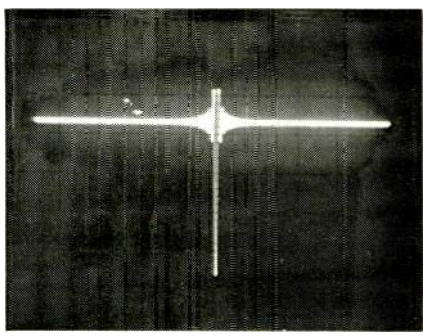

Fig. 13—Single-pulse test.

monically related "beats" or spurious signal components are evident.

Figure 7, a plot of channel separation versus frequency, yielded extremely surprising results. I can't remember any other time when separation *decreased* with decreasing frequencies! Yamaha is apparently aware of this peculiarity, too, since their published specifications call for separation in excess of 100 dB *at 1 kHz and 20 kHz*. That claim is met, as you can see from Fig. 7, but at 125 Hz, separation decreased to about 84 dB. Nothing to worry about, of course, but simply an oddity for which I can offer no immediate explanation.

I know of only one or two other CD players that reproduce low-level signals with linearity as nearly perfect as the Yamaha CDX-1110U's. Consider the results shown in Fig. 8, a plot of deviation from perfect linearity versus undithered signal levels. Here, maximum deviation at −90 dB was no more than 1.0 dB. Using low-level dithered signals from recorded levels of −70 to −100 dB, deviation from perfect linearity (Fig. 9) was a mere 1.0 dB for the right channel and about 2.0 dB for the left channel at levels of −100 dB. That's standout performance, to say the least.

There are currently two methods for specifying dynamic range for a CD player. Using the EIAJ Standard, the results showed a dynamic range of approximately 88 dB, regardless of whether the measurement was made from the direct or the filtered outputs. With the proposed EIA method, dynamic range was slightly in excess of the 98-dB theoretical maximum, confirming the very slight deviation from perfect linearity observed for the D/A converters used in this player. The "Fade to Noise" track provided on my CD-1 test disc gives further proof of the excellent linearity of this player at extremely low levels (Fig. 10).

The final track of the CD-1 test disc contains test signals that are not specifically called for in the proposed EIA Standards for CD Player Measurement. Used in combination with the other linearity-checking signals, this one is employed in what is called a monotonicity test. The signal consists of a special series of square waves. The peak of the repeating waveform starts at "digital zero" and increases by 1 LSB (least significant bit) after every five cycles, to a maximum of 10 LSB. Averaged steps should always increase on the positive side and decrease on the negative side. Ideally, the steps should be equal in size. Both of these requirements seemed perfectly met when playing this signal on the CDX-1110U, as is evident in the 'scope photo of Fig. 11. (More than one repetition of the ascending waveform is shown because of the difficulty of synchronizing this signal.)

As usual, I tried to measure wow and flutter for this player quantitatively, but as has nearly always been the case, my test equipment produced a trace running along the zero baseline for the full 30 S of the test. (In other words, there was no measurable wow and flutter.) As for clock-frequency accuracy, it was off by an insignificant −0.0163%.

Figure 12 shows how a 1-kHz square-wave test signal was reproduced by the CDX-1110U, while Fig. 13 shows how a unit pulse was reproduced. It is apparent that polarity inversion has taken place within the analog output stages of the player, since noninversion circuits always yield a posi-

Void after November 30, 1988

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READER FEEDBACK

1. Which of the following home audio equipment items do you plan to purchase in the *next 6 months*?

A. ☐ Separate amp, pre-amp, or integrated amp
B. ☐ Tuner
C. ☐ Receiver
D. ☐ Speaker System
E. ☐ CD Player
F. ☐ HiFi VCR
G. ☐ Stereo TV

2. What is your best estimate of the total amount of money you plan on investing in home audio equipment in the *next 6 months*?

H. ☐ Less than $50
I. ☐ $50-$99
J. ☐ $100-$199
K. ☐ $200-$299
L. ☐ $300-$499
M. ☐ $500-$749
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Stereo imaging was good with either output, but was just a bit more stable via the unfiltered output.

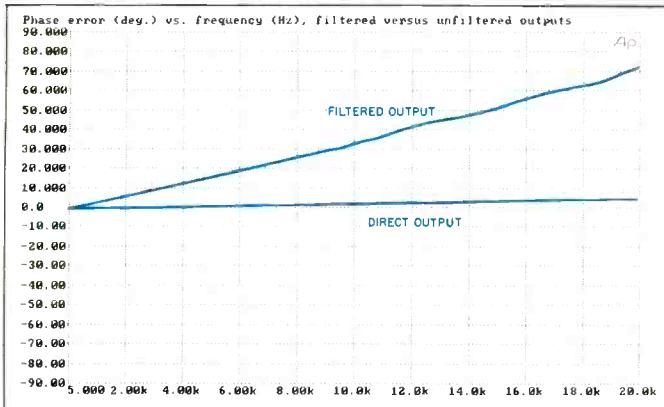


Fig. 14—Comparison of phase error vs. frequency for filtered and direct outputs. (Note linear frequency scale.) At 20 kHz, error amounted to nearly 72° from filtered output, 5° from direct.

tive-going reproduced pulse, whereas the pulse in Fig. 13 is negative going. (This polarity inversion was the same with the direct and the filtered outputs.)

Finally, I wanted to check Yamaha's claims concerning the advantages of a CD player with filterless outputs. To make a meaningful test, I had to go inside the unit and get at the recovered signal, right at the point where it comes out of the D/A converter. (There is one Burr-Brown type PCM56 for each channel.) I treated the signal, at this point, as one channel of an interchannel phase-comparison test and connected the filtered output of the same channel as my "second" channel. I then ran a phase-comparison test between the two signals as a function of frequency. The results are shown in Fig. 14. Notice that the horizontal scale in this graph is *linear* rather than logarithmic. Thus, the phase shift caused by the analog output filters is almost a straight line and is more easily examined. At 20 kHz, this phase error has reached a value of 72° (top curve). When I repeated this measurement, comparing the output from the D/A converter to that at the direct, unfiltered output, the maximum phase error at 20 kHz was only 5°. This is, perhaps, the most important advantage of the unfiltered, direct output connection in a CD player.

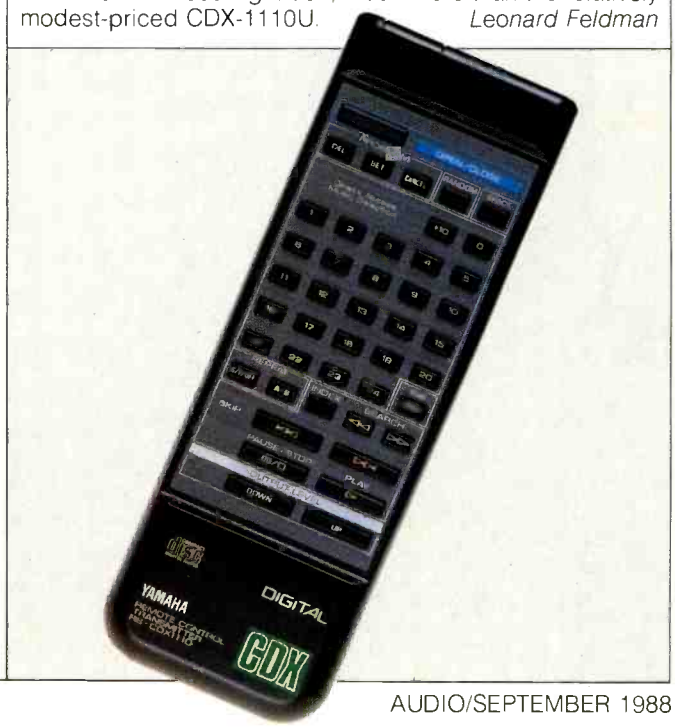
Use and Listening Tests

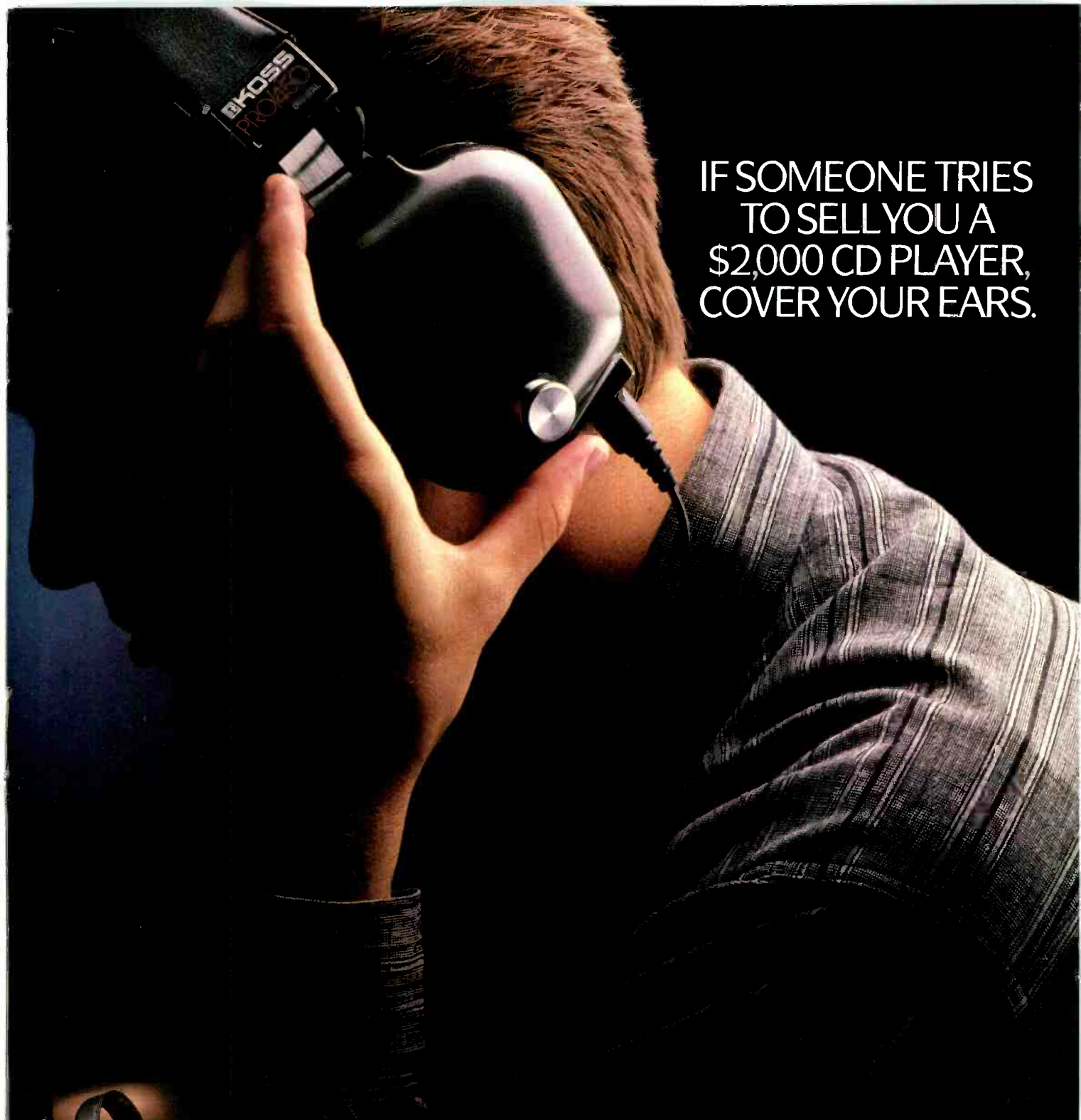
For my subjective listening tests, I chose four Compact Discs designed to show up specific aspects of sound reproduction. Delos' *The Symphonic Sound Stage* (D/CD 3502) offers a variety of cuts from different symphonic selections that not only exercise the dynamic-range capabilities of a sound system but enable me to judge stereo imaging, depth of sound field, and musical accuracy of individual instruments. Bands 7 and 8 of this sampler contain piano and cello solos that are well recorded and, on a CD player such as this, sound amazingly lifelike. For smaller orchestral works, I used Telarc's new recording of three short Mozart symphonies—No. 25, No. 28, and No. 29 (CD-80165). Instrumental definition, as reproduced by the Yamaha player, was superb. During playback of this particular recording, I was able to detect one of the advantages of the direct output connection. Stereo imaging, while good with either connection mode, seemed just a bit more stable and easily defined when I used the direct, unfiltered connection.

For bigger, more dynamic sounds, I chose another Delos recording, *Wagner 2* (D/CD 3053), which features orchestral excerpts from Richard Wagner's operas *The Flying Dutchman*, *Parsifal*, and *Lohengrin*. These excerpts offer excellent examples of wide dynamic range and complex orchestration. They are best appreciated when heard on a top CD player such as this and through an amplifier and speaker system that can handle them with negligible distortion.

Finally, I listened to a bit of Bach's Prelude and Fugue in E Minor, a Telarc recording (CD-80169) with Michael Murray playing the organ in New York City's Cathedral of St. John the Divine. It is gratifying to note that, as Compact Discs get better and better (and there's no question but that the best of them are very good these days), CD players are also improving in ability to sonically reproduce those discs.

The only minor irritation I felt regarding the user controls and features of the CDX-1110U concerned its inability to program selections by index numbers. Further, the method of calling up an index number for instant access or playback is a bit awkward, in that you first must press the track number, then the index button, and finally the index number. There's also no easy way to advance from one index point to the next within the same track. These ergonomic limitations, however, in no way detract from the sonic superiority of this player. Yamaha's latest entry deserves to be ranked among the very finest machines currently available, and that includes several costing much, much more than the relatively modest-priced CDX-1110U. *Leonard Feldman*





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PS AUDIO 4.6 PREAMPLIFIER

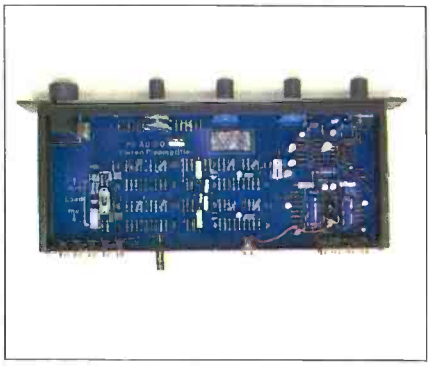
Company Address: 4145 Santa Fe Rd., Bldg. 2, San Luis Obispo, Cal. 93401.
For literature, circle No. 93

A little over a year ago, PS Audio began producing the Model 4.5 preamplifier; it offered extraordinary sound, given its cost. For 1988, several circuit improvements were made, and they are incorporated in the Model 4.6. Among other things, Paul McGowan and company have lowered the open-loop gain, increased the current through the regulators, and added a star-point ground. These improvements are hardly visible, but they are very, very audible.

The 4.6 measures only 19 × 2½ × 7½ inches, but that's because its power transformer (and fuse) are in a separate unit, called the HPCS, that's made to sit on the floor, away from the preamp and your turntable. It measures 4¾ × 5½ × 4½ inches, weighs 2½ pounds, and is connected to a special jack on the back of the preamp.

Perhaps the first clue that this is not an ordinary device is the power switch. It really isn't a power switch at all—the unit is always powered up. Labelled "Output," the switch has settings for "Off" (output to the power amplifier is turned off), "Straightwire" (no amplification stages), "High Level" (amplification stages turned on), and "Mono" (amp stages on, mono output). Just to the right of the power switch are two output knobs: "Tape Feed" controls which source is channelled to the tape 1 output, and "Source" controls the output to your power amplifier and speakers. This allows you to listen to one program source (phono, tape 1 or 2, tuner, CD, or AUX) while recording from another. The final front-panel knobs are a small, stepped "Balance" control and a larger, stepped "Volume" control.

Inside the 4.6 is a switch to select MM or MC phono stages as well as space to install resistors to match the system to your cartridge. On the rear panel, you'll find the usual complement



of input and output jacks (gold-plated) and the connector for the external power supply. That's it! No filters, tone controls, or devices to change the way your system will sound—and therein lies the beauty of the PS Audio 4.6. Under the right conditions, this preamp allows you to hear your source material without adding much of anything.

Now, about those conditions: If your speaker's sensitivity is a good match for your power amplifier, you'll be able to use the 4.6 as a passive device and to hear high-level source material (CD, tuner, tape, video, etc.) with only the preamp's wiring and switches intervening. The sound in this mode is glorious. My CD player and tuner never sounded more open and real. The soundstage is wide and deep, almost indistinguishable from playing the CD, tuner, or tape deck directly into the power amplifier.

If the 4.6 and your power amp don't match up, or if a record or tape was recorded at low levels, you won't get enough volume from your system. Then it's time to switch in the 4.6's amplified stages.

On the 4.6, the phono section is where you are fully aware of all the changes PS Audio has made. I thought that the old 4.5's moving-magnet section was very good, though perhaps it added a small amount of solid-state "steeliness" to the overall sound. Any steeliness I once heard is now almost nonexistent in the 4.6, and the dynamic

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When using the 4.6 preamp passively, the sound was glorious; my CD player and tuner never sounded more open and real.

range of its phono section now seems to be much greater than that of its predecessor. The other major improvement is in the soundstage presented by this preamp. With the right discs, musicians seem to be playing in front of and way behind the speakers, and that sense of depth extends to the outer edge of each loudspeaker. Putting all of this together, PS Audio has come up with the best MM phono stage I've auditioned in a preamp costing $1,000 or less.

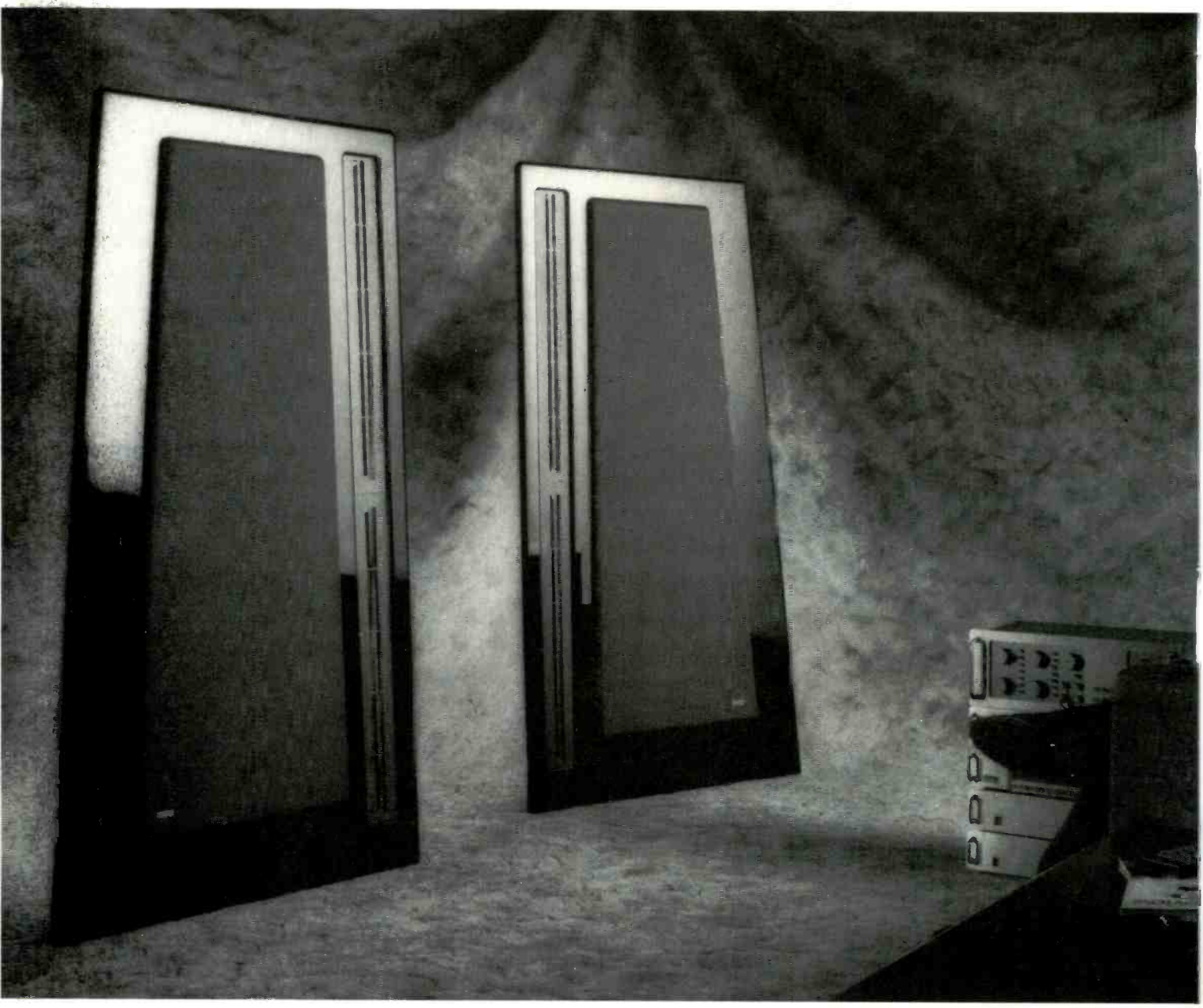
The moving-coil section of the 4.5 had not been as satisfying. True, my test location in lower Manhattan is near both the World Trade Center and the Empire State Building, and the r.f. generated by the many transmitters on them doesn't help. I preferred the sound of a moving-coil cartridge played through a pair of Ortofon T-5 transformers and the PS Audio 4.5's moving-magnet section. In the 4.6, there is a big improvement, so unless you have similar problems, you should be very satisfied with its MC stage. The preamp also comes with a small bag of resistors to adjust the load for an MC cartridge. However, I found hunting for the proper color-coded pair of resistors was time consuming, and they yielded no discernible sonic benefits with the cartridge I used.

Whatever source you select, if you need more volume than the "Straightwire" mode can provide, you'll have to move on to the "High Level" stages. It was at this point that the 4.5 began to have a very definite sound of its own, one that was slightly hard and "transistory." I felt that the 4.5's added amplification stages detracted from the overall sound, but this is not the case on the 4.6. Its Class-A high-level stages are much improved. While not perfect, they can now be recommended (even if you *do* have enough gain in the "Straightwire" mode).

The 4.5, when first marketed, cost $500; its successor costs $659 but is well worth it. The 4.6 is built very well, is very flexible, and sounds great—something the competition will be hard pressed to equal or beat. If you currently own a 4.5, PS Audio will upgrade your unit for $100. If you're in the market for a new preamplifier, I suggest you listen to the 4.6 before buying anything else. *Gary Krakow*

Before I buy a car, Maggie always does the test driving.

Amazing.



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Q. Why use a ribbon driver?

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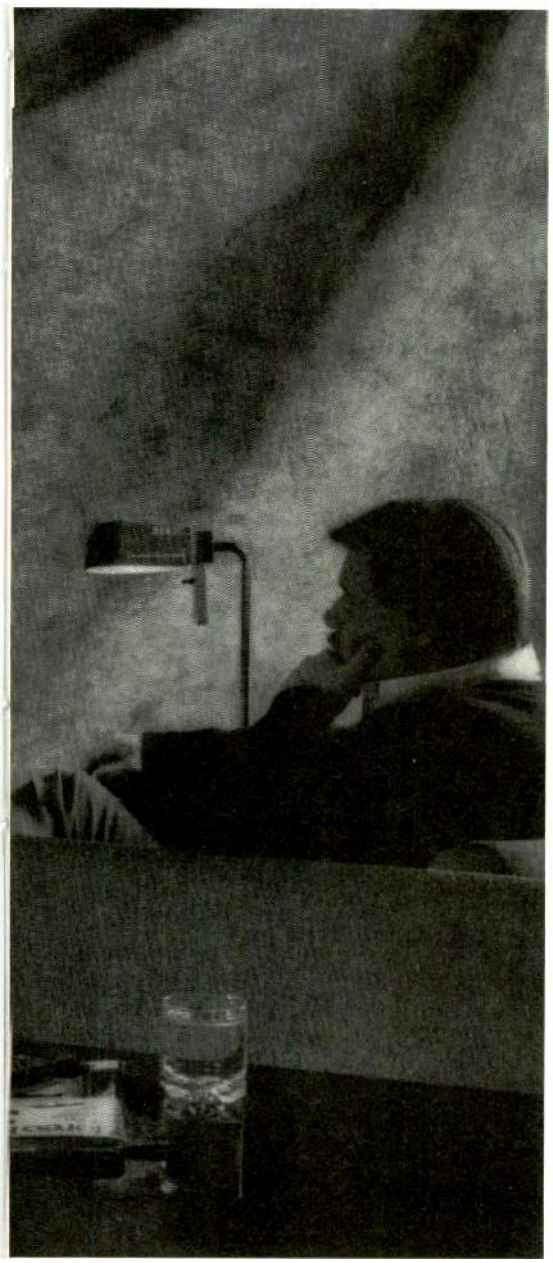

This is not a typical speaker ad. Because The Amazing Loudspeaker is anything but a typical speaker.

This isn't even a typical *Carver* ad.

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STEREO REVIEW

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HEAVIER METTLE

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OU812: Van Halen
Warner Bros. 25732-1, LP; **25732-2,** CD.

Sound: A–/B+ Performance: A

OU812 is more than just a record. It's also a new identity for Van Halen, just now emerging after a tabloid divorce from David Lee Roth. In a word, it's *good*.

Sammy Hagar was behind the gun for *5150*, which was raced out amidst the competition and acrimony of the personnel split. The songs (however good) sounded like Hagar was doing an imitation of the old Van Halen. For *OU812*, Hagar's pipes are in better shape than they've ever been. He's more in control now with confident growls and howls, with inspired crooning on the ballads, especially "When It's Love." Sure, there are echoes of Roth, but somehow, well, you feel like Hagar *means* what he's singing about. He has fun, but there's not the cartoony sense of cynicism you always felt with Roth's persona.

Van Halen is still a party band, no doubt, but the Hagar impact can be heard in the slightly more "philosophical" musings of several of the new songs. As in "Mine All Mine," where a self-reliant search for truth is favored over conflicting religions, and in the CD bonus tune, "A Apolitical Blues," a gritty, slide-guitar-driven, tongue-in-cheek paean to apathy. Not revolutionary, but a change. Of course, these are more than balanced by the sentiments in (Let's do it till we're) "Black and Blue," but even here there's a subtle shift in perspective away from adolescent slam-bam chauvinism toward a mutually shared *joie de vivre*. A minus was almost docked for failure to police the "message in a bottle" metaphor in "Feels So Good," but then it won't be the first time a good line has been recycled.

After the voice, you'll notice Eddie's rekindled interest in keyboards, which have mostly replaced rhythm-guitar tracks. He tends to use them in a block chordal fashion, heavy on suspended notes, rather than melodically, which can get a little sugary. This is especially noticeable on the ballads. But if you're afraid of missing the legendary guitar chops, not to worry: Eddie kicks on every single track. For a primer on tapping (hammering down on the strings as they're fretted, sans picking), check out the burning intro to "Source of Infection." For straight-ahead, distorted yet ever so smooth, jet-propelled EVH bump and grind, "A.F.U. (Naturally Wired)" will make your day.

Besides the blistering technique, Eddie also has a genius for always coming up with the right solo, leaving you satisfied but hungry for just a little more. For example, just as "Feels So Good" gets a bit too top o' the pops, he counterattacks with off-the-wall (but not overdone) wails comparable to anything in rival Roth-band guitarist Steve Vai's arsenal.

Recorded at Eddie's home studio, 5150, the production and sonics of both LP and CD are generally spacious and excellent, with a big concert-hall presence. Some tape hiss is audible on the CD, especially on the fades, but then this isn't the kind of music where that should hamper your enjoyment.

With *OU812*, Van Halen demonstrates that it has survived the separation. The band's sound is maturing but still capable of cleaning up with a vengeance. This is hard rock at its best.

Michael Wright

scenes from the southside: Bruce Hornsby and The Range
RCA 6686-2-R, CD.

Sound: B+ Performance: B+

scenes from the southside, the second Bruce Hornsby and The Range album, is a fine companion to their debut, *The Way It Is*. Again, the songs spin tales of life far removed from the urban centers. "The Valley Road" is about the sad consequences of a tryst between a hired hand and the plantation owner's daughter. "The Road Not Taken" wistfully recalls a youthful romance in a Virginia coal-mining town. "Till the Dreaming's Done" harks back to a memorable encounter with a hooker, and "The Show Goes On" is an end-of-summer-romance story/song.

Other cuts have points to make. "Look Out Any Window" is about pollution's killing effects on land and sea, and its impact on farmers and fishermen. "Defenders of the Flag" was surely inspired by the recent escapades of televangelists. "Jacob's Ladder," which was a big hit for Huey Lewis two years ago, also addresses this issue from another angle. "The Old Playground," the most urban song here in terms of subject matter, relates the psychology of the blacktop basketball court.

The sound of The Range continues in the piano-based, richly melodic vein. Produced by Bruce with engineer Neil Dorfsman (coproducer of Dire Straits' *Brothers in Arms*), the technical sound is smooth and burnished to a warm glow. Hornsby's emotional vocals cry eloquently, and they are made

more aching by the high, lonesome harmonies of Rangers George Marinelli and Joe Puerta. After two years on the road together, the band plays as a compassionate unit with an obvious love of their music.

I must question, however, why this album was not recorded digitally. It would have been a big plus, especially on the piano sound. Dorfsman worked extensively with digital recording on the Dire Straits project and he has the know-how to do it right. Curious. . . .

The fine, fine work of *scenes from the southside* won't surprise people. Its songs are as thoughtful and literary as those on *The Way It Is*. But this record goes on to fulfill the promise of that debut. It establishes Bruce Hornsby as an artist who's in for the long haul and proves that the group is far more than a one-hit wonder. *Michael Tearson*

Now and Zen: Robert Plant
Atlantic/Esperanza 90863-2, CD.

Sound: B+ Performance: A–

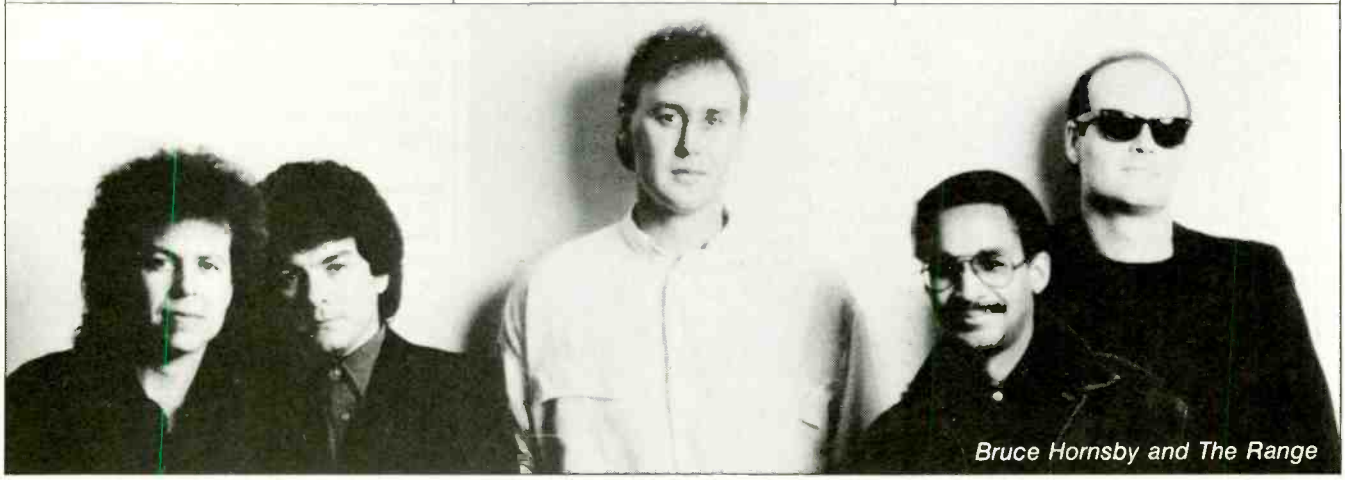
All the hoopla about this album being a return-to-Zep move for Robert Plant is so much nonsense that it defames the memory of the most influential rock band of the '70s. There are a few passing references to Led Zeppelin, such as a guest appearance by Jimmy Page on two tracks, but Plant is basically continuing his solo career by collaborating with talented players and writers. Robbie Blunt and Phil Collins have been replaced by keyboardist Phil Johnstone and guitarist Doug Boyle, and Tim Palmer has joined the team as Plant's coproducer. They are

slightly more modern than Plant's previous cohorts and allow him to capitalize a little more on one of his best assets: His ability to camp it up. He's given a straight song like "Heaven Knows" and uses his tongue-in-cheek delivery to strut and ponce as only a '70s Rock Icon can.

But Zeppelinesque? Hardly. Zeppelin's music thrived on chaotic rhythm guitars, anchored by hard-hitting reverberating drums, punctuated by stabs of lead guitar fills. This Plant stuff is all very orderly, polite, occasionally rocking but always supported by a machine-steady drummer. (Zeppelin refrained from click tracks or drum machines, and the difference made for a little humanity in their music.) "Tall Cool One" allows Plant to exercise his rockabilly chops, as does "Billy's Revenge," but these rollicking numbers shouldn't be confused with "Communication Breakdown" or "The Ocean." "Ship of Fools" even sounds more like U2 ("Sunday Bloody Sunday," to be precise) than "Stairway to Heaven." This is not to say that this is a bad record, because it actually is a very good one for Plant, whose previous records have been a little long on murky atmospherics and short on songs. As far as musical style, it is, as one of the song titles suggests, "White, Clean and Neat."

One must remember that Led Zeppelin's music originated as a bastardization of the blues. Even if Willie Dixon wasn't credited for "Whole Lotta Love," he was credited on other Zep songs and probably made more publishing royalties from their first album than from two decades of hard writing at Chess. Jimmy Page, a missionary of the blues turned wacked-out riff-monster of sorts, was the chief architect of the Zep sound. Plant as a solo artist has his moments as a singer, and he can write a silly lyric; he has also established a career which allows him to put together a band which complements his talents, but Zeppelin will never be again!

As for *Now and Zen*, it is a well-recorded collection of songs, about half of which is memorable. The playing is of a very high standard, and the production ideas are very creative. Mick Jagger could take a lesson here. *Jon & Sally Tiven*



Bruce Hornsby and The Range

On Sade's latest release, the sound is as splendid as the songs of passionate loyalty and ecstatic love.

Stronger Than Pride: Sade **Epic EK 44210,** CD.

Sade's third album, *Stronger Than Pride*, features the same polished, jazz-inflected pop music that first brought her to prominence in 1985. Once again, the exotic singer has co-written all 10 cuts on this Compact Disc, and she has acted as producer and arranger. Here too, songs of ecstatic love, passionate loyalty, and undying-yet-hopeless unrequited love flow from the pens of Sade and her excellent band members, Stuart Matthewman, Andrew Hale, Paul Denman, and sideman Leroy Osbourne. The result is a superb recording of this singer's extraordinary talents presented in the laser-light of CD perfection.

The title cut is the glowing pearl of this album. Sade's smoky, sultry voice floats in the foreground, close to the ear, and seeps under the skin. Rich, subtle drumwork; soft, distinctive percussion, and full, buzzing bass form a rhythmic support system for breathtaking musical details. The song's highpoints are the sweet, liquid, acoustic-guitar solo and Osbourne's brief, perfectly balanced vocal underline to Sade's voice on the repeated chorus of "I still really, really love you/Love is stronger than pride."

The sound on this CD is as splendid as the musical content. It is a quiet pool through which vocals and instrumentals shine like bright coins on a sugar-white, sandy bottom. The only disturbing ripple in this idyllic oasis of sophisticated jazz/pop splendor is the repetitiousness that sets in after a few cuts. Although there are certainly characteristic differences among various selections—"Paradise" is a bit funkier and more uptempo, "I Never Thought I'd See the Day" is replete with a terrific heartbeat bass line and elegant strings, and "Siempre Hay Esperanza," the only full instrumental, has been kissed by Spain—the cumulative effect of her work smacks of a bit too much familiarity. But a small ripple does not a tidal wave make—this is a lovely, eminently listenable Compact Disc. *Paulette Weiss*

In a Very Unusual Way: Karen Akers **Rizzoli 1004,** CD. (Available from Rizzoli Records, 31 West 57th St., New York, N.Y. 10019.)

Karen Akers is the "new kid in town" on the cabaret circuit. Not that she hasn't been performing to adoring audiences for many years, but she's "new" in the sense that she's a member of the younger generation of seri-

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In a Very Unusual Way is a gorgeous album, as close to a perfect sound mirror as has yet been produced.

ous popular singers—the Michael Feinsteins and Steve Rosses rather than the old-guard Bobby Shorts and Blossom Dearies.

This elegant "kid" has put forth a particularly gorgeous album. The Compact Disc of *In a Very Unusual Way* is a limpid, rich, and utterly glittering technical accomplishment; it is as close to a flawless sound mirror as has yet been produced. Akers' voice is recorded with breathtaking intimacy way up in the foreground. Instrumentals delicately frame her husky, honeyed tones; they remain out of the spotlight yet glow with a life of their own, clear and vibrantly alive down to the lightest ripple of silvery chimes.

In character with the best of the cabaret crowd, old and new, the choice of songs is intelligent, well-balanced, and sometimes startling. The old masters of popular song are well represented (George and Ira Gershwin with "How Long Has This Been Going On," Lerner and Loewe with "I Loved You Once in Silence") as are some new masters and masters-to-be (Stephen Sondheim with the oh-so-lovely "Not a Day Goes By," Peter Allen with the mordant "I've Been Taught by Experts"). Producer Helen Keane's astute judgment is evident here, much as it was in the sure-handed, sensitive guidance she provided for the late pianist Bill Evans' splendid recordings.

Akers' delivery is knowing and theatrical, her natural sense of drama adding unspoken layers of meaning to the simplest of lyrics. Like many of the cabaret crowd, her vocal quality takes some getting used to. It is a rich voice, with peculiar depths and a marked "European" or operatic vibrato. It is not a uniformly "pretty" instrument, but—like Bobby Short's delightfully thick, nasal quality or Blossom Dearie's breathless little-girl delivery—it grows on you.

Welcome to town, kid.

Paulette Weiss

Aki Special: Prince Nico Mbarga
Rounder CD 11545, CD.

Sound: A Performance: A

"Yawa" (Yah' uh wah) is a Nigerian expression of pleasure that will come in handy as you move to the dance grooves on Prince Nico Mbarga's *Aki Special*. Billed second in popularity behind King Sunny Ade, Mbarga pumps out a hypnotic, upbeat, West African pop known as "Panco," which draws on both diverse continental traditions and music returning, most notably, from the Caribbean (particularly reggae).

Kingdom Come's slavishly imitative Led Zeppelin sound may sell a lot of records, but it reveals a want of imagination.

Structurally, this music consists of extended multilingual vocals (including English) over fairly simple chord patterns—often just two—and syncopated African rhythms with repetitive, dual-guitar riffs weaving in and out. Unlike Ade's more densely textured guitar-band sound, Mbarga places two very funky guitars at the edges of the mix, with smooth vocals and rhythm section centerstage. The dominating guitars have that wonderfully fat, distinctive sound possible only with cheaper instruments of dubious intonation. As with many other African art forms, there's an unpolished earthiness here which, to Western ears, often belies the skill behind it. Hot spots include the title cut, "Sweet Mother" (a big hit), the soaring fretwork in "Wayo In-Law," and the bird-like glissando effects and almost-calypso feel of "Nature."

AAD on the digital scale, the 63 minutes of this Nigerian-recorded music are remarkably noise free, although a tad more articulation in the rhythm section would have been welcome.

Like much dance music, the effect of Prince Nico Mbarga's *Aki Special* is cumulative rather than virtuoso. Its subtleties paradoxically convey the promise of both a good time and a pleasurable meditation. Yawa!

Michael Wright

Kingdom Come
Polydor 835 368-1, LP.

Sound: B Performance: D–

From out of nowhere, Kingdom Come's song, "Get It On," descended onto album-rock radio and saturated the airwaves with its slavishly imitative Led Zeppelin sound. This song, from the group's self-titled debut album, sounded like a collection of Zep fragments cobbled into something that might be considered new. Since George Harrison lost the suit which the copyright holders of "He's So Fine" had filed against him for "My Sweet Lord," I figured that these Kingdom Come guys could be in deep trouble.

After hearing the whole album, I reached several conclusions. First, Kingdom Come will surely sell a lot of records to people too young to remember Led Zeppelin in their heyday. Second, if simply doing an effective imitation of a successful sound is all that it takes to be innovative musicians, then these guys are geniuses. The bottom line: Kingdom Come is a well-recorded and competent (if generic) hard-rock band that has hit on a very successful gimmick. This cynical gimmick makes good business sense but makes no sense at all if you're looking for a fresh sound to stimulate the imagination.

My recommendation: Skip *Kingdom Come* and vote with your dollars for the new Robert Plant album, *Now and Zen*.

If, as they say, imitation is the sincerest form of flattery, Kingdom Come is the sincerest group of flatterers in this decade.

Michael Tearson

WINNING WILLIAM

Illustration: Rick Tulka

William Bolcom: Twelve New Etudes; Stefan Wolpe: Battle Piece. Marc-André Hamelin, piano.
New World Records NW 354-2, CD.

If any composer can be singled out as epitomizing contemporary American music's incredible stylistic diversity, it is William Bolcom. This year's recipient of the Pulitzer Prize for music, Bolcom's very trademark is the juxtaposition of heterogeneous idioms, from classical to neo-Romantic to '60s avant-garde, and from '30s pop to jazz, pre-rock, and cabaret, a genre in which he has made several recordings with his wife, Joan Morris.

The "Twelve New Etudes" for piano, for which the Pulitzer was awarded, were originally conceived for pianist Paul Jacobs. Bolcom had completed nine of them at the time of Jacobs' death in 1983; the remaining three were written in 1986. The entire set is "intended to reflect the changes in me as a composer," says Bolcom, who feels his music has grown increasingly tonal over the years. Marc-André Hamelin performed the work's premier last year. As first-prize winner in the 1985 Carnegie Hall International American Music Competition for Pianists, Hamelin was entitled to a recording on New World Records, and this one, just out, is it.

The ease with which Bolcom moves in and out of his chosen musical milieus is immediately apparent in these pieces. The second etude uses a four-note motive which is parallel to that in Copland's "Piano Variations" and which teeter-totters back and forth between the tension of mild dissonance and the release of a common jazz progression.

Elsewhere, there are restless, disjointed spurts of energy: A study in delicate, mostly upper-register filigree called "Butterflies, hummingbirds"; a square, tonal ostinato that drones on under rhythmically disparate, mostly angular treble activity; aggressive fistsful of tone clusters that, in "Premonitions," are spelled out arpeggio style, resonating freely after they land at a single resting tone.

Hamelin's approach to these intense, difficult pieces is straightforward, logical, yet excitingly fluent. It is as if he untangles the knots of Bolcom's whimsical architecture. He is equally impressive on Stefan Wolpe's "Battle Piece," whose essentially chilly, cerebral nature seems a bit exaggerated in the company of Bolcom's warm expressivity. *Susan Elliott*

(*Editor's Note*: Here are some comments about the technical aspects of this recording.)

Princeton University's Richardson Auditorium, a very successful revamping of old Alexander Hall, is an increasingly popular recording venue for East Coast projects, and for good reason. In addition to a full winter season, it is home to the chamber arm of New Jersey's Waterloo Festival, and its mix of generous space and visual intimacy are introducing many summer listeners to chamber works in open, unfettered ambience. Even a large orchestra does not overload the hall. So how does a solo piano fare there?

To judge from Timothy Martin's nicely balanced recording of what sounds like the house's excellent Steinway D, a big grand records handsomely in Richardson. Bill Bolcom and the late Stefan Wolpe confront an interpreter with an encyclopedic set of tonal and dynamic demands, so it would be unthinkable (though it is all too often done) to confine the recording of their piano music to the dry, constricted milieu of the standard studio, even a big one like RCA's much-overrated Studio A. Richardson Auditorium is a superb choice for a pianist to take a whack at these tough nuts. *Christopher Greenleaf*

Joseph Schwantner: A Sudden Rainbow/Sparrows/Distant Runes and Incantations. Saint Louis Symphony Orchestra, Leonard Slatkin.
Nonesuch 79143, LP.

Stephen Paulus: Symphony in Three Movements; Libby Larsen: Symphony. Minnesota Orchestra, Neville Marriner.
Nonesuch 79147, LP.

Here are two discs in Nonesuch's worthy "Meet the Composer" series, orchestra residency products out of one of those large, brave, and expensive country-wide operations that assist our "classical" composers to realize their bigger ideas in a costly medium. They are able to work and live near the orchestra and to write for it and have their compositions performed—an admirable idea from many viewpoints. Along with this, inevitably, there is a recording, to take the music out of the concert hall to a more general public, to libraries, and so on.

But all too typically, the music on these discs was clearly *not* written for that purpose. Nor is it in any way shaped for the recorded medium. It is strictly live-concert music, as if recording did not exist. Except for Nonesuch and the indefatigable Marc Aubort as recording engineer, I can perceive not the slightest interest, throughout all this music, in *the recorded medium as an equal alternative*, according to its own requirements in the composing. "Let the recordings fall where they may," is the way I read it, and have all too often in the past for similar music.

Many nominally "classical" composers today pay a great deal of attention to results on tape, the sound of their music as it comes through on records. Others have a natural ability to write music that "works" in audio terms (Stravinsky is one). But too many, and especially those who participate in such symphonic operations as this, are neither interested nor informed as to what we might rightfully call the audio alternative.

Having said this, I note that these are interesting and highly competent professional works, well worth a good performance and wider distribution via audio's helpful facilities. But they are all, one way or another, difficult to record effectively, as can be heard all too easily despite Marc Aubort's expertise. The records are plenty listenable for any living room and maybe even a car stereo, but the textures are so thick and diffuse—in the recorded form—that one wishes for a half- or quarter-size orchestra! (Not possible, of course.)

Joseph Schwantner's three fat works—the second with soprano solo, the third with piano—are contemporary "synthesis," bringing together in a big Romantic/mystical framework many aspects of earlier 20th-century music and the more distant 19th century. It is an enormously complex, thickly colorful sound matrix that is superb, I am sure, in a good live hall. However, via any sort of recording, even multi-mike, it is turgid and not clear. "Sparrows," with the excellent (and distant) Lucy Shelton, is based on Japanese haiku, with curious irruptions—a seeming 14th-century processional out of Europe, a flurry of pseudo-Bach in the flutes. "Distant Runes and Incantations," with Ursula Oppens' piano, is nicely dreamy. I liked it. On the other disc, Stephen Paulus' "Symphony in Three Movements" is sturdy, quite unmystical, with a traditional structure showing through the dissonance—a bit unoriginal and even old fashioned, in a way. Libby Larsen's equally proficient "Symphony," with the "Water Music" subtitle, is full of expert splashings of harps and such, reminding one a bit of Respighi's well-known "Fountains of Rome"—only milder and nicer. Both orchestras, in these works written for them, go to town, as they say, and enjoy themselves.

Edward Tatnall Canby

Journeys: Orchestral Works by American Women. Bournemouth Sinfonietta, Arioso Chamber Orchestra, Carolann Martin.
Leonarda LE 327, CD.

Sound: B Performance: B–

I am as wary as the next person of a collection of works by women composers. By its mere title, *Journeys: Orchestral Works by American Women* is probably bound to fail in the marketplace.

Too bad, for there is merit in much of this music, and enjoyment in most of it. The subject of a recent Publisher's Presentation profile (April 1988), conductor Carolann Martin has gathered seven scores by as many women and recorded them for Leonarda, a nonprofit label not so coincidentally run by a woman. Martin conducts England's Bournemouth Sinfonietta on all but the last track, where the chamber group Arioso performs.

This is a well-paced and varied program. The opening "Journeys," by Nancy Van de Vate, is a richly expressive piece that juxtaposes bold percussion and harsh brass fanfares with moments of dreamy etherealism. Occasional Middle Eastern motifs flash by, reminiscent of the composer's last stop in her travels, Indonesia.

By contrast, and perhaps by intent, Kay Gardner's "Rainforest" lacks drama and remains on a single, pastoral plane. Despite its oriental flavor, "Rainforest" is essentially New Age music. Its skeletal orchestration also reveals a somewhat noisy recording.

Libby Larsen, certainly the most familiar name here, is represented by "Overture—Parachute Dancing," a light, celebratory frolic that makes judicious use of virtuoso percussion and brass work. Both it and Marga Richter's "Lament" show skillful develop-


Neville Marriner

Conductor Carolann Martin gathered seven works by as many women for the CD *Journeys*, and overall, the effort proved a worthy one.

ment of material, and build to natural climaxes. The latter is scored for string orchestra and was written as the composer's mother lay dying of cancer. It is unquestionably the recording's most moving work, building its structure from a gradual accretion of detail. Unfortunately, the middle-range strings occasionally sound sour.

"Summer Night" is an apt description of what Katherine Hoover evokes in her lyrical, bucolic work that spotlights the horn and flute. It is engaging and thoroughly accessible. Ursula Mamlok is perhaps misrepresented in that "Elegy" is but one (slow) movement of her "Concertino" for woodwind quintet, string orchestra, and percussion. By itself, the piece never quite takes off; the interpretation, too, seems somewhat lackluster. The strings don't dig in as they seemingly could, and the horns sound out of sorts.

Jane Brockman's "Perihelion II" is, as its title implies, a study in perpetual motion, and a melodramatic one at that. This version is scored for string orchestra; the original is for strings and computer-generated tape and was commissioned by the Arioso Chamber Orchestra, the group that performs it on this recording.

Performances are generally solid, though inner voices are occasionally untended. This is a worthy effort, and most of those who contributed to it deserve to ply their trade to a wider public. One hopes that *Journeys* will be a beginning. *Susan Elliott*

Robin Is to the Greenwood Gone: Paul O'Dette.
Nonesuch 79123-1, LP.

This Elizabethan lute music is not nearly as esoteric as you might think, notably for guitar players and their listeners. The lute was the most sophisticated of the plucked instruments and came in many forms, having its own notation in codes that indicated the frets and rhythms—tablature, as with the organ.

The lute is gentle and a nearby instrument, so to speak. But it has more strings than any guitar and, in particular, a stronger and lower bass. Lute players, who played both fancy music and plain (as this record makes clear) developed virtuoso skills, notably in the playing of more than one melodic line at a time. Yes, the guitar has a shinier, prettier sound, but the lute still has its points, and is alive and well.

This is an excellent introduction to lute music, neatly graded from straightforward to more complex. The first side is full of solid old English tunes, most of them given variations that are easy to enjoy. "Greensleeves" is one of these, familiar to us all, but other tunes that are often still around have that sturdy English sound and the interesting harmonies that will fascinate all sorts of folk players today—there's plenty to be learned here. I found myself whistling "Carman's Whistle," a tune that many composers at the time of Elizabeth set in various tricky ways. Other not-so-sophisticated gems are "Goe from my window," "Kemp's Jigge/The Parlement," and "Dump phillí," otherwise known as "Philip's Dump." (Note that a dump is *not* a trash pile.)

The second side veers interestingly to Scottish music, a batch of tunes even I could recognize as Scottish in sound. It later turns back to a somewhat more sophisticated English group by Anthony Holborne et al. These are dances, but more elaborately set. Good digital album. Good music! Try it, you guitarists. *Edward Tatnall Canby*

Ravel: Daphnis et Chloé (Complete Ballet—1909-11). Choeur et Orchestre National de France, Eliahu Inbal.
Denon CO-1796, CD.

We are all aware that the famous ballet scores, going back to Tchaikovsky and before, are mostly heard in excerpts or suite form, both in the concert halls and on records. This is simply a matter of musical economy. In the ballets, there is much music that goes with specific actions on stage, alternating with the big "set pieces" which make up the visual show and the solid musical continuity. For concert use, these connecting links have often been eliminated because they seem to stumble and hesitate minus the visible action. On records, beginning with the 78, even shorter versions were obviously necessary, and most early LPs didn't bother to change the familiar.

But curiosity—and available space with the LP—began to bring us the longer versions. You get so much more of the piece.

"Daphnis et Chloé" has been a holdout—we are most of us familiar only with the wild, orgiastic final scene, featuring a shouting, wordless chorus, in the vein of "Le Sacre du Printemps." This complete "Daphnis" is the first I remember hearing, and there is a lot of "new" music to be heard, particularly interesting when the wordless chorus is part of the orchestra.

Inbal is the man who did Denon's fine Mahler series, with the innovative many-miked "one-point" stereo. His Ravel is equally idiomatic in the rendering, with an all-French cast replacing the German performers for Mahler. *Edward Tatnall Canby*

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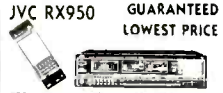

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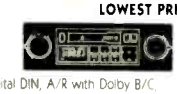

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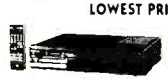

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DUKE'S DIAMONDS

Duke Ellington and His Orchestra, 1943–1945
Circle CLP 105, LP; monaural. (Available from Circle Records, 1206 Decatur St., New Orleans, La. 70116.)

Sound: A– Performance: A

This is the fifth volume of Duke Ellington recordings to be released in recent years by Circle Records. As with all of the recordings to be included in this series, *Duke Ellington and His Orchestra, 1943–1945* has been compiled from never-before-released recordings made for radio, taken from the World Broadcasting System's transcription library. The fact that the performances here stand very much on their own and, for the most part, are much superior to the Duke's Victor recordings which followed, makes this album a valuable addition to anyone's Ellington collection. When one considers that these are the *only* recordings which Ellington and his orchestra made during this time period—the Petrillo recording ban had all but stopped the commercial recording of many popular artists—then this album becomes a true treasure.

By 1943, there had been significant personnel changes in the Ellington orchestra, including the addition of trumpeter/violinist Ray Nance, who plays superbly on "Ring Dem Bells"; the former Chick Webb trumpet star Taft Jordan, who plays beautifully on the traditional "Chopsticks," and Jimmy Hamilton, whose mellow, precise clarinet replaced Barney Bigard's. There is also a new bassist, Alvin "Junior" Raglin. Hamilton plays a marvelous swinging clarinet on Fats Waller's "Honeysuckle Rose," helped by the effortless swing of Raglin's bass. Also on hand, and as masterful as ever, are trombonist Lawrence Brown and alto saxist Johnny Hodges, both at their peaks. Listen to Hodges on the extended "Mood to Be Wooed." Who else but Hodges could have played like that?

The 1945 dates introduce us to vocalist Joya Sherrill, a great asset to the Ellington band during this period, who sings on "I Didn't Know About You" and "I'm Beginning to See the Light." The rhythm includes Fred Guy's guitar and the rarely heard but excellent drumming of Hillard Brown, one of the regular substitutes for Sonny Greer.

Photographs: Frank Driggs Collection

There are three takes in this volume that were not even issued for radio, and I think the majority of listeners may never have heard these songs before in any form. "Midriff," "Rose Room," and "I Didn't Know About You (Take Three)" show us, above all, how much of a master Duke Ellington really was. Some of his key soloists, who had been with him for a decade, had gone; yet he continued to produce the kind of inimitable and transcendental music heard on this series of recordings.

Listeners who are familiar with either earlier or later versions of many of these compositions are going to be very pleasantly surprised by the high quality of the playing and the recording. Jack Towers did an unusually fine job of remastering and transferring this music; it is very well engineered and very clean, and it represents the state of the art as heard in the mid-1940s.

Like the other discs in Circle's Ellington series, this record is highly recommended. *Frank Driggs*

RCA Victor Blues and Rhythm Revue: Various Artists
RCA 6279-1-R, two-LP set.

Sound: B+ Performance: B

This interesting reissue was the swan song for RCA's vice president of A&R, Greg Geller, and it has wonderfully sardonic liner notes by Jerry Wexler, one of the real heavyweights in this musical genre.

Let's start off with the talented singer Lil Green. Her recordings of "Why Don't You Do Right?" and "Romance in the Dark" were cut in 1940-41 for Bluebird; they sold quite well but were issued exclusively in black neighborhoods. A year later, Peggy Lee cut the same songs with Benny Goodman's band for OkeH and had nationwide hits. Lil Green never rose above the "race" or rhythm-and-blues designation, and in 1954 she died, almost totally forgotten.

Both Erskine Hawkins' and Earl Hines' big bands were known to white audiences, and they contribute outstanding examples of a blues setting achieved within the big-band framework. Pianist Avery Parrish achieved immortality with "After Hours," and every black band felt compelled to play this number for years afterwards. Earl Hines was never thought of as a blues pianist, but his band rang the bell in a very big way with singer Billy Eckstine on "Jelly, Jelly" and "Stormy Monday

Lil Green

Blues." Jazz lovers in those years usually avoided listening to pop singers like Eckstine, but they hugely enjoyed Scoops Carry's wonderful alto sax chorus on "Jelly" and the magnificent Shorty McConnell trumpet solo on "Stormy Monday."

There is more big-band work here: The frantic and audacious Lucky Millinder managed to keep his band afloat well into the 1950s by moving on to R&B after World War II. His "D Natural Blues" has a real Savoy Ballroom slow-drag tempo, with some mellow Fred Henderson tenor sax and screaming trumpets led by Fats Ford.

In the '40s, Count Basie was finding it more and more difficult to keep his big band together. The band was being pulled in opposite musical directions, with be-bop on one side and rhythm and blues on the other. The arrangers he employed then relied more on trumpet shakes and glisses than on the array of great soloists which Basie had featured in the past. "Hey Pretty Baby," with its deeply felt Jimmy Rushing vocal, manages to hark back to the fine blues Basie had recorded years before. In 1949, Basie had a fair-sized hit with "Did You See Jackie Robinson Hit the Ball?" featuring a vocal by dancer Taps Miller and good (but brief) solo bits by trumpeter Harry Edison and the underrated tenor man Bill "Weasel" Parker. Basie's band broke up not long after this was recorded.

By the time "Rooming House Boogie" was recorded, Cab Calloway was pretty much out of the big-band business and was working mostly with seven pieces. This Louis Jordan-styled tune features tenor saxophonist Sam "The Man" Taylor, but it was not successful. Calloway soon turned to the Broadway stage to keep his career alive.

The rest of this package falls more or less into the category of rhythm and blues, which Jerry Wexler himself coined while he was a staff writer at *Billboard* magazine. Try some of the

Cab Calloway

Rob Wasserman's *Duets* is a daring musical excursion and a clear candidate for the year's end Best List.

priceless 1952 Little Richard cuts (one written by Leonard Feather) which show his great promise as a *blues* singer—a path he might have followed, had the times been different. I also like composer/arranger Jesse Stone's "Cole Slaw," which features a Stone vocal and tenor and trumpet work by Eddie "Lockjaw" Davis and Shad Collins. Also included is a cut by Milt Trenier, backed by Shorty Rogers and other West Coast modern jazzmen earning an anonymous buck. Poet Frank Patchen is on piano.

The set closes strongly, with fine performances by The Du Droppers, King Curtis, and The Isley Brothers, all major names in rhythm and blues just before rock 'n' roll broke out as a national phenomenon.

All in all, this is a well-produced and historically valid package from Greg Geller. *Frank Driggs*

Duets: Rob Wasserman
MCA 42131, LP.

Sound: B Performance: A

Who would have guessed that a jazz upright-bass player's album would be a daring musical excursion, and a clear candidate for the year's end Best List? Nevertheless, Rob Wasserman's *Duets* is just that.

The music here involves Wasserman's bass with eight singers and one violinist. What makes this project so very compelling is the variety of roles the bass takes on in relation to the voices—as Wasserman notes on the jacket, "from supportive to lead to orchestral." Clever deployment of multitracking allows the bassist and individual singers to perform several roles at once. Two of the most daring cuts on this album are Aaron Neville doing "Stardust" and Jennifer Warnes singing a stunning new Leonard Cohen song, "Ballad of the Runaway Horse." Neville's rendition of the classic "Stardust" is beautiful, the multi-tracked angel chorus nervy and dreamy at the same time. In Warnes' selection, her strongest work is when she is singing backup, with the odd counters, fills, and harmonies she performs like nobody else. Following her lead, Wasserman creates some pretty astonishing sounds for a big, old bass fiddle.

Other cuts to listen for are Rickie Lee Jones on "The Moon Is Made of Gold" (a song written for her by her father), with its acoustic guitar and lightly tinkling bells; Bobby McFerrin's voice and body percussion on "Brothers"; Dan Hicks—the mad scatter himself—on "Gone With the Wind"; Manhattan Transfer's Cheryl Bentyne singing "Angel Eyes," and, of all people, Lou Reed checking in with electric guitar in tow for a wry "One for My Baby (And One More for the Road)." Wasserman also sings a scat duet with his bass that is cleverly called "Duet." The album's finale matches Wasserman's bass with Stephane Grappelli's violin on a heart-

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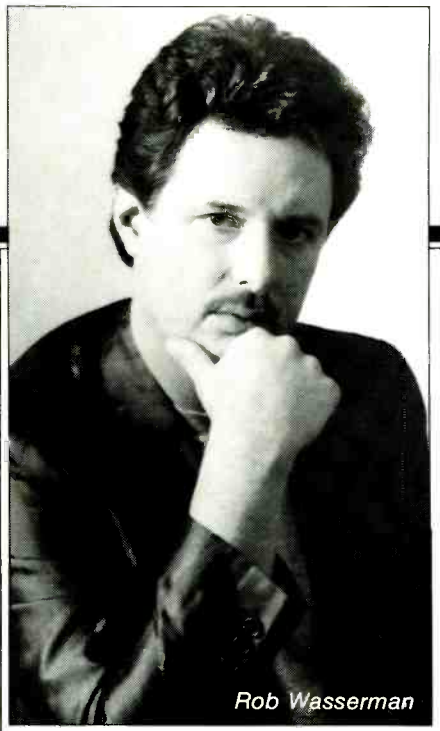
On *Sanctified Dreams*, Tim Berne jettisons funk and electricity for a neoclassical chamber vision of gritty blues.


Rob Wasserman

melting version of "Over the Rainbow." The Grappelli track is a pure duet in which the violin and bass take turns challenging variations out of each other, flipping roles back and forth. This cut and the Cheryl Bentyne track are live performances mixed to two-track.

This digitally mastered recording is rendered very well throughout. Wasserman's bass has fine body and resonance, and the vocal textures, which must be very good for the album to succeed, are. *Michael Tearson*

Sanctified Dreams: Tim Berne
Columbia CK 44073, CD.

Sound: A– Performance: A–

Tim Berne is quickly becoming one of the most original conceptualists in jazz. He's bypassed the mainstream revivalism of Wynton Marsalis, taken the lessons of free jazz, and fused it with contemporary vernacular. His last album, *Fulton Street Maul*, was a celebration of impassioned, unbridled blowing with fragmented electric drive, mostly from guitarist Bill Frisell.

On *Sanctified Dreams*, Berne jettisons the electricity and funk for a sort of neoclassical chamber vision of gritty string blues with cellist Hank Roberts. Berne composes in broad smears, with torturous hard-bop melodies turning into chamber improvisations, as if the Kronos Quartet were to double on horns and swing.


Tim Berne

"Velcho Man" is representative, though nothing on this record is typical. A jumpy, unison opening leads into free solos, with Roberts' cello arcing underneath Herb Robertson's scurrying trumpet. Roberts and bassist Mark Dresser alternately interweave and play parallel lines, switching between arco and pizzicato. Unlike bebop's string of solos over set changes, Berne's ensemble moves fluidly from one musician to the other, from improvisation to composition.

Joey Baron is a drummer to watch. He manages to be simultaneously musical and driving. On "Hip Doctor," he pushes the band through the changes; on "Elastic Lad," he beats out tribal rhythms for dark Roberts' solos that wail into the night. This cut is one of the centerpieces of *Sanctified Dreams* and shows Berne's maturation as a composer. The piece shifts through several movements, alternately somber and joyous. Berne, with his composing and soloing, shifts the piece from a dirgelike meditation to anguish, his squealing alto segueing into Robertson's muted trumpet cries.

Berne's intimate composing and the textural interplay of the musicians is well served by this CD recording, which reveals so much of the space that is part of his composition. Berne is developing a broad body of work that is unified by an increasingly individualistic vision. *John Diliberto*

Live from Chicago—Bayou Lightning Strikes: Lonnie Brooks
Alligator AL-4759, LP.

Sound: B+ Performance: A–

Live from Chicago—Bayou Lightning Strikes is the first Lonnie Brooks album to capture his music as well as his life and times. With this set, Brooks takes the giant step as a skilled, exciting bluesman. This veteran's songs have always been a distinctive brew of the Louisiana bayou rhythms on which he was raised, the roots rock 'n' roll he favored when touring the South under the name Guitar Junior, and the guitar-driven Chicago blues. Yet the same gifts which distinguished him as a songwriter and performer also distanced him from the earthiness of less-talented bluesmen; too often, the seams have shown in his records.

Brooks' arrangements and band have gotten more sophisticated while his own guitar has gotten rawer. His road-seasoned rhythm section is constantly in overdrive, balanced by Brooks' shouted vocals. Years of straining to be heard in small clubs have given this man a voice ill-suited to subtlety but perfectly matched to his raucous, roof-raising live shows.

"Born with the Blues" is representative of the modern material that Brooks does best. Built around a deliberate, primal bass riff and laced with sharp, cutting guitar, the number is destined to become his signature song. Each verse is as strong as the verse before it, while his solos prove that he gives no ground to current blues guitar masters. The performance is one of those rare renderings that could go on forever without boring an audience.

Live from Chicago—Bayou Lightning Strikes is a first-rate album of modern blues. As fine as it may be, however, it can't bring into your listening room the Lonnie Brooks who strolls behind the bar at his concerts, pours himself drinks during his solos, and works the crowd with the skill of a singer who's spent decades on tour. See him live for the full measure of the man. After years of paying dues, maybe it's time for Brooks to start doing some collecting. *Roy Greenberg*

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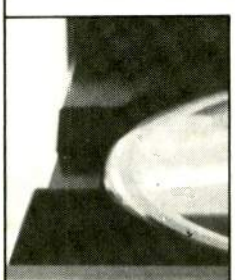

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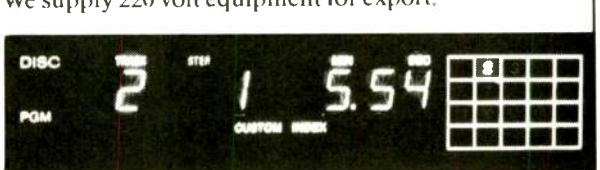

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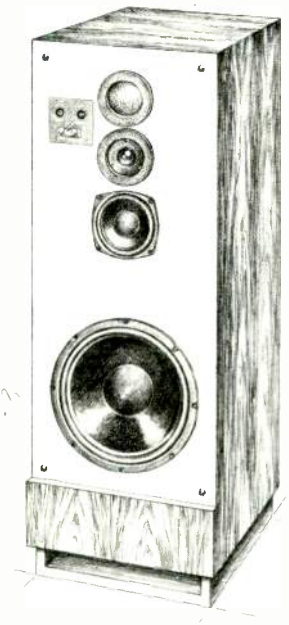

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Fact: Over 1400 movies on videotape and laser disc have been encoded with Dolby® Surround Sound.

Fact: Compact discs have established a new level of audio realism.

Fact: TV broadcasts in rich, full-bodied stereo have become the rule, rather than the exception.

With all the amazing new audio source material that's available these days, it's understandable that you'd want to rush right out and get the equipment you need to enjoy it.

But the fact is, much of the equipment that promises to turn the act of listening into a big thrill, can actually turn out to be a big disappointment.

Which is why, when it comes to the subject of Surround Sound, you really should listen to NEC.

▶NEC HAS MORE EXPERIENCE WITH SURROUND SOUND THAN ANYONE ELSE.

And that's not the only thing that gives us an edge. You see, we're the leading maker of semiconductors. Since the technology of Surround Sound is largely dependent on microprocessors, we're in a unique position to create the exact circuitry necessary to give you the most lifelike sound.

For example, only NEC offers digital delay circuitry throughout its entire Surround Sound line.

Many of our components have adjustable digital delay, which lets you fine-tune delay time, in millisecond increments, to suit the acoustics of your room.

And all our Surround Sound components feature genuine Dolby circuitry, so you can take full advantage of the Dolby Surround Sound information encoded on so many tapes and discs.

What's more, our high-end components offer a level of Surround Sound that is unsurpassed by anyone in the industry.

It's called Dolby Pro-Logic Surround.

▶PRO-LOGIC. THE BEST OF THE BEST.

For sheer audio realism, it rivals anything you've ever heard in any movie theater.

Pro-Logic circuitry is remarkable for its ability to deliver far better channel separation than conventional systems can: from 26 to 40dB, as compared to only about 3dB.

What's more, Pro-Logic has an active center channel—a separate, additional sound track—which conventional systems lack.

This center channel dramatically heightens realism.

Sound seems to emerge, not from any given speaker, but rather from the precise point in space that it should.

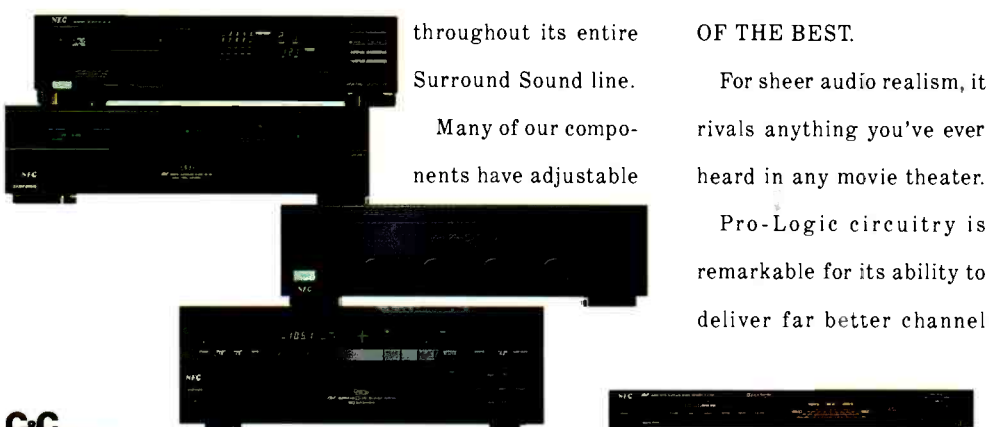
It also *moves* to follow the action of whatever's making the sound, whether it's a bee buzzing slowly across the screen, or an F-16 blasting over your head.

▶YOU'VE GOT TO HEAR IT TO BELIEVE IT.

The feeling you get from NEC Surround Sound is impossible to describe in words. Which is why you should ask an NEC dealer for a demonstration.

It'll help reinforce one very important fact:

Certain things in life simply cannot be compromised.



NEC

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