

# Stereo Review

## SPECIAL: JAPANESE AUDIO TECHNOLOGY

**JAPANESE EQUIPMENT  
MADE IN THE U.S.A.**

**HOW TO BUY  
A RECEIVER**

**USER'S REPORT:  
THE SANSUI SE-88  
GRAPHIC EQUALIZER**

**LISZT ON RECORDS**

**LAB TESTS:**

**ONKYO TA-2056  
CASSETTE DECK**

**KLIPSCH FORTÉ  
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**LUXMAN R-406  
AM/FM RECEIVER**

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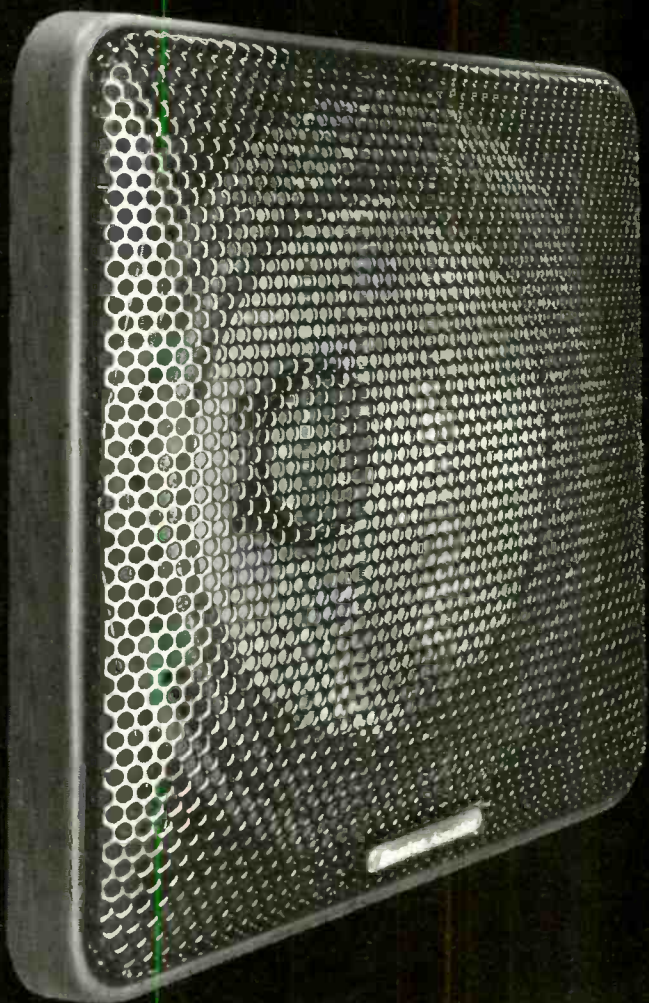
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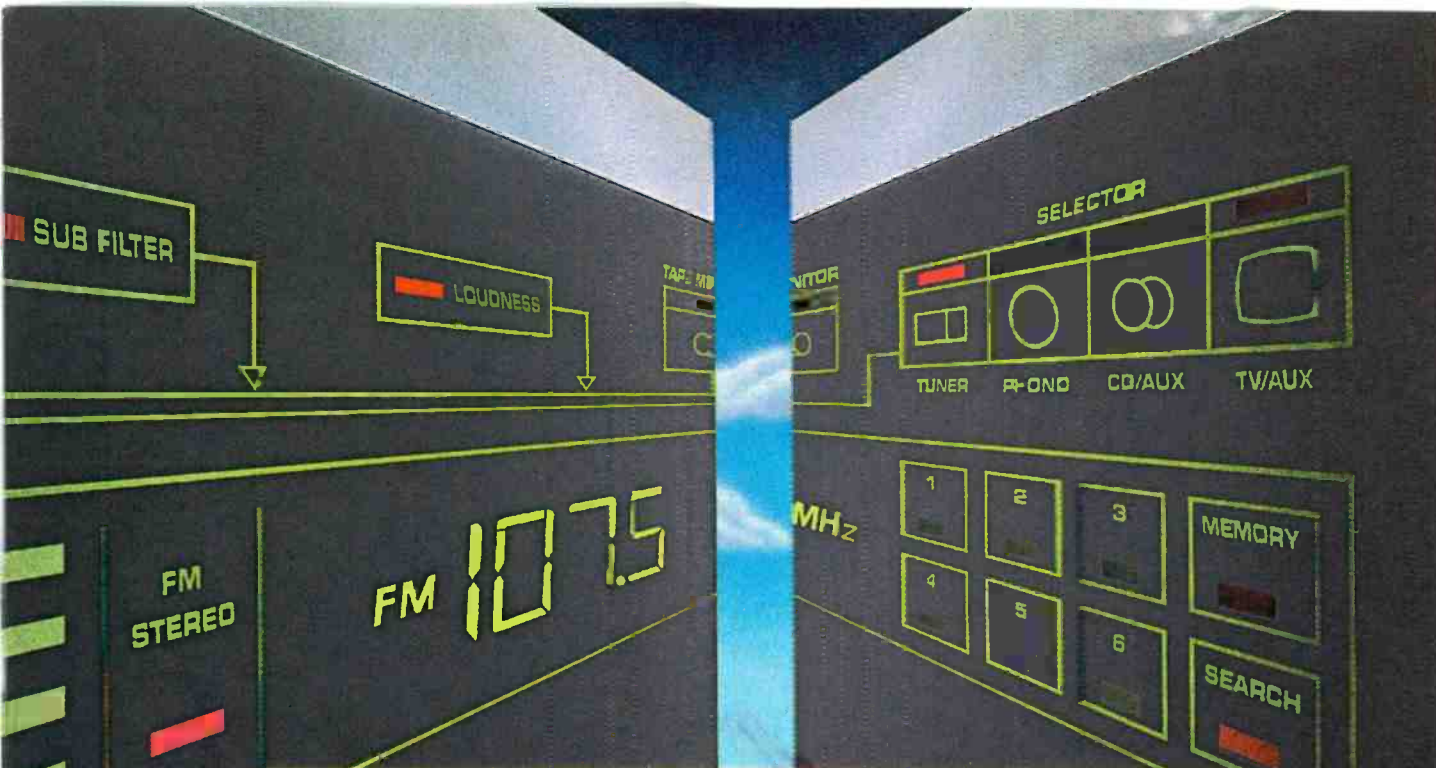
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# Stereo Review

BULLETIN.....	5	RODRIGUES CONTEST.....	28
EDITORIAL.....	8	TECHNICAL TALK.....	30
LETTERS.....	11	CLASSICAL MUSIC.....	99
NEW PRODUCTS.....	16, 124	POPULAR MUSIC.....	106
AUDIO Q&A.....	18	THE HIGH END.....	136

## EQUIPMENT

CAR STEREO	24
------------	----

In the lab and on the road with the Soundstream TC-308 AM/FM tuner and tape player  
by Julian Hirsch and Christopher Greenleaf

HIRSCH-HOUCK LABS EQUIPMENT TEST REPORTS	35
--	----

Onkyo Integra TA-2056 Cassette Deck, page 38  
Luxman R-406 AM/FM Receiver, page 38  
Advent Legacy Speaker System, page 41  
Revolver Turntable, page 45  
Klipsch Forté Speaker System, page 48

SPECIAL REPORT: JAPANESE AUDIO TECHNOLOGY	52
---	----

Representatives of some of Japan's leading audio manufacturers and members of the Japanese audio press discuss the technology of today and tomorrow  
by Bryan Harrell

MADE IN THE U.S.A.	80
--------------------	----

Japanese audio/video factories from coast to coast  
by William Burton

SYSTEMS—JAPANESE ECLECTIC	82
---------------------------	----

Effective sound from all over  
by William Burton

HOW TO BUY A RECEIVER	84
-----------------------	----

What are your options? Set your priorities before you start shopping  
by Dawn Gordon

## MUSIC

LISZT ON RECORDS	89
------------------	----

A centennial survey  
by Richard Freed

BEST RECORDINGS OF THE MONTH	93
------------------------------	----

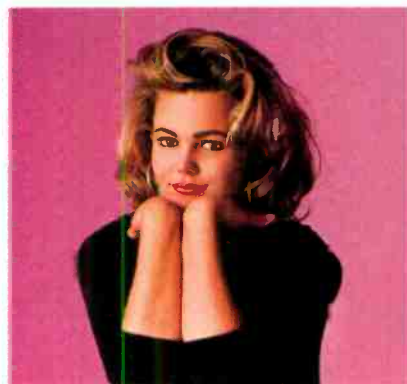
Reba McEntire, Mozart's piano sonatas, Stan Ridgway, and Mendelssohn's symphonies

RECORD MAKERS	132
---------------	-----

The latest from James Brown, Belinda Carlisle, Don Dorsey, Tony Bennett, the Fat Boys, and more



PAGE 52



PAGE 133



PAGES 35, 54

The Japanese-made components featured on our cover are, top to bottom, the Sony CDP-203 CD player, the Onkyo Integra TA-2056 cassette deck (tested in this issue), and the Yamaha LV-X1 LaserDisc player. Table and screen by Sage Reynolds, Four Hands Design Studio, courtesy of Tansuya.

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by Christie Barter and Gordon Sell

## ELLINGTON COMMEMORATIVE



The U.S. Postal Service has issued a twenty-two-cent commemorative stamp honoring the late composer and band leader Duke Ellington, who wrote such standards as *Sophisticated Lady*,

*Satin Doll*, and *I Got It Bad* as well as such jazz classics as *Mood Indigo* and *Black and Tan Fantasy*. Ellington is the eleventh composer to be commemorated on a United States stamp.

## TECH NOTES

Blank tape prices are going up. TDK, Maxell, and Fuji have all announced price hikes to offset the increase in the value of the yen. Sony will also increase prices, especially on half-inch video tape, but says it will be less affected than companies that do not make tape in the United States. . . . Motorola claims that 279 broadcasters are using their C-QUAM AM stereo system and that 98 percent of all AM stereo radios are C-QUAM only. Sanyo, however, has just introduced an all-system AM stereo IC chip. . . . Onkyo had hoped to have working prototypes of its DAT (digital audio tape) deck to demonstrate at CES in Chicago in June, but is now aiming for the Japan Audio Fair in October instead. . . . Sansui and Akai will also be among those showing DAT decks in Japan in October and here at Winter CES next January. Akai expects its prices to be \$500 to \$600. . . . To keep its prices competitive in the present currency situation, Sansui is looking for manufacturing sites outside Japan.

## PEOPLE

CBS Masterworks has named Rudolf Serkin as its second Artist Laureate (the first was Isaac Stern) in recognition of an artist-to-label relationship that spans more than four decades. . . . Riccardo Muti, music director of the Philadelphia Orchestra, was awarded an honorary doctorate by Mount Holyoke College. . . . Composer John Cage also re-

ceived one, from the California Institute of the Arts. . . . Composer and conductor Morton Gould has been voted president of the American Society of Composers, Authors, and Publishers. . . . Max Roach, jazz percussionist and composer, has been honored in England by having a London park named after him. . . . Jean-Pierre Rampal's CBS recording of Claude Bolling's *Suite for Flute and Jazz Piano* is the first by a classical artist to hold a place on one of *Billboard's* album charts as a best-seller for ten years. This record is surpassed only by Pink Floyd's "The Dark Side of the Moon," which just passed the twelve-year mark.

## MULTILAYER IC'S

Although the traditional integrated circuit (IC) may have four or more layers, it is still essentially a two-dimensional design. Now, according to Donald Rogers, director of electronics R&D for Du Pont, many IC manufacturers are working on chips with thirty or more circuit layers. The next step will be three-dimensional molded circuit assemblies that will incorporate integrated circuits, connectors, conductors, spacers, and reinforcing structure in one very small package.

## NEW BOOKS

*Symphony Orchestras of the United States* by Robert R. Craven (Greenwood Press, Westport, CT, 521 pp., \$55) contains thumbnail sketches of 126 leading orchestras. . . . *The Scouting Party Index of Independent Record Labels* by Norman Schreiber (Scouting Party Press, 343 Seventh Avenue, Brooklyn, NY 11215, 56 pp., \$5) provides information on more than 200 small record companies. . . . *The New Sound of Stereo* by Hans Fantel and Ivan Berger (Plume, NY, 265 pp., \$12.95) is a guide to buying and using hi-fi equipment. Noted audio journalists, Fantel and Berger are both former contributing editors to *STEREO REVIEW*.

## WARNING

The Parents' Music Resource Center, otherwise known as the Washington Wives, headed by the wife of Tennessee Senator Albert Gore, has been calling on record

companies to affix warning labels on albums containing "explicit" references to sexual activity, drug use, and other subjects from which, in the PMRC's view, youngsters should be protected. Very few of the labels have actually materialized on record jackets, but one appears on a recent PolyGram album by the popular French singer Serge Gainsbourg, "Love on the Beat."

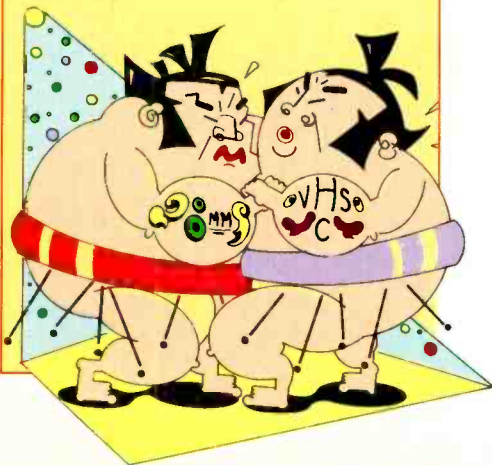


## TO THE DOGS

The traditional rivalry between contributors to the WFMT/Chicago Symphony Radio Marathon pledging on behalf of their pet dogs and cats ended this year in a narrow victory for the dog lovers, reversing last year's competition results.

## VCR SLUGFEST

Another battle of the formats is brewing, and conspicuous combatants include Sony and Matsushita (parent company of Panasonic, Quasar, and Technics). Last year Sony introduced an 8mm VCR and a very small, lightweight camcorder. It was announced in December that Matsushita would begin marketing 8mm products this summer. The announcement was premature. Matsushita has since endorsed a competing lightweight VHS-C camcorder introduced by JVC and endorsed by Hitachi, Sharp, and Toshiba. Preliminary skirmishes have included muscle flexing in aggressive ads in industry publications. It proves that Japanese consumer electronics companies do not get together behind closed doors to decide in advance which products will prevail in the world market.



TERRY ALLEN



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*Stereo Review*

Matthew Polk's ultimate dream loudspeaker, the SDA-SRS, won the prestigious Audio Video Grand Prix Speaker of the Year award last year. Stereo Review said "Spectacular... it is quite an experience" and also stated that the SRS was probably the most impressive new speaker at the 1985 Consumer Electronics Show. Thousands of man hours and hundreds of thousands of dollars were spent to produce this ultimate loudspeaker for discerning listeners who seek the absolute state-of-the-art in musical and sonic reproduction.

Matthew Polk has, during the last year, continued to push his creative genius to the limit in order to develop a smaller, more moderately priced Signature Edition SDA incorporating virtually all of the innovations and design features of the SRS without significantly compromising its awesome sonic performance. The extraordinary new SRS 2 is the successful result. Music lovers who are privileged to own a pair of either model will share Matthew Polk's pride every time they sit down and enjoy the unparalleled experience of listening to their favorite music through these extraordinary loudspeakers, or when they demonstrate them to their admiring friends.

**"Exceptional performance no matter how you look at it"**

*Stereo Review*

Listening to any Polk True Stereo SDA\* is a remarkable experience. Listening to either of the Signature Edition SDAs is an awesome revelation. Their extraordinarily lifelike three-

dimensional imaging surrounds the listener in 360° panorama of sonic splendor. The awe inspiring bass performance and dynamic range will astound you. Their high definition clarity allows you to hear every detail of the original musical performance; while their exceptionally smooth, natural, low distortion reproduction encourages you to totally indulge and immerse yourself in your favorite recordings for hours on end.

Julian Hirsch of Stereo Review summed it up well in his rave review of the SDA-SRS: "The composite frequency response was exceptional... The SDA system works... The effect can be quite spectacular... We heard the sound to our sides, a full 90° away from the speakers... As good as the SDA feature is, we were even more impressed by the overall quality of the Polk SDA-SRS... The sound is superbly balanced and totally effortless... Exceptional low bass. We have never measured a low bass distortion level as low as that of the SDA-SRS... It is quite an experience! Furthermore, it is not necessary to play the music loud to enjoy the tactile qualities of deep bass... Exceptional performance no matter how you look at it."

The awe-inspiring sonic performance of the SDA-SRS 2 is remarkably similar to that of the SRS. Words alone can not express the experience of listening to these ultimate loudspeaker systems. You simply must hear them for yourself.

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*Stereo Review*

Both the SDA-SRS and the SDA-SRS 2 are high efficiency systems of awesome dynamic range and bass capabilities. They both incorporate Polk's patented SDA True Stereo technology which reproduces music with a precise, life-like three dimensional soundstage which is unequalled and gives you, as Julian Hirsch of Stereo Review said, "literally a new dimension in sound". Each beautifully styled and finished cabinet contains 4 Polk 6½" trilaminate polymer drivers, a planar 15" sub-bass radiator, 2 Polk 1"

silver-coil polyamide dome tweeters and a complex, sophisticated isophase crossover system.

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*Musician Magazine*

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\*U.S. Patent No. 4,489, 432 and 4,497, 064. Other patents pending.

Where to buy Polk Speakers? For your nearest dealer, see page 117.



by William Livingstone



With Masaharu Matsushita, chairman of Matsushita Electric Industrial Co.

## Made in Japan

**B**ECAUSE of the record value of the yen in relation to the dollar these days, the American media have recently scrutinized Japanese industry even more nervously than usual. *Business Week* wrote of the "hollowing" of American industry. On PBS, *Adam Smith's Money World* asked whether the Japanese are merely a bunch of workaholics or are possibly better than we are. An NBC special presented them as grimly obsessive workers with a miserable standard of living.

Akio Morita, chairman of Sony Corp., claims that Japanese companies are not taking business away from American manufacturers. He says our companies are giving it up. In commenting on ways to improve the balance of payments between this country and Japan, Prime Minister Yasuhiro Nakasone gently criticized Americans for chauvinism by pointing out that all young Japanese businessmen study English, but young Americans do not usually learn Japanese.

Speaking to the Panasonic national sales meeting at New Orleans this year, Masaharu Matsushita, chairman of Matsushita Electric Industrial Co., said that MEI should be considered an international company rather than Japanese because it is now active in 130 countries. Its revenues reached \$24.9 billion last year, and the U.S. (MEI's second-best customer) accounted for \$3.7 billion of it.

MEI employs 8,000 people in the United States. When I asked Mr. Matsushita if he planned to expand manufacturing in this country, he said he would like to because it would be welcomed by the people, but the cost of manufacturing here makes profitable expansion difficult. Nevertheless, he expects MEI to begin making VCR's in this country by the end of 1986.

Japanese-owned factories that make audio and video equipment are shown on the map on page 80, part of our scrutiny of Japanese audio technology. The cover story (page 52) was written by Bryan Harrell, our Tokyo correspondent. On page 134 Michael Smolen evaluates a Japanese equalizer, and on page 82 William Burton describes a home system that combines Japanese components with some that were made elsewhere.

Soon after I spoke with Mr. Matsushita, I read a depressing article in the *New York Times* about the poor quality of instruction in physics in this country. Our physics majors are not able to fill the needs of education and industry today, and the article said we are becoming a nation of scientific illiterates.

Bryan Harrell cheered me up by telling me he was able to conduct the interviews for his article in Japanese. (Mr. Matsushita and I had relied on an interpreter.) In case you want to start learning the language, Harrell's article includes an audio glossary in Japanese. □

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## Vertical Tracking Angle

Thank you for Ralph Hodges's April "High End" column on the vertical tracking angle (VTA) of phono cartridges. It's a topic that has puzzled and bothered me for years. I know that my tonearm needs adjustment and that it is adjustable, but the instructions don't tell me how to know when the proper adjustment has been achieved.

Now, finally, Mr. Hodges provides the answer: by ear. And the adjustment more than likely only involves minutes of arc rather than degrees. I'm still as confused and afraid of VTA as when I was totally ignorant of it. But it's comforting to know that there are others who appreciate the "downright scarieness" of the project and who also admit that "the path to sonic righteousness is nothing if not tortuous."

KEVIN WELLER  
Lockport, NY

Having just subscribed to STEREO REVIEW, I knew I'd be amused by audiophiles, but so much so fast? I'd like to see Ralph Hodges take a blind tonearm taste test to tell us which VTA is really

bringing "multiple choruses of Mahler's Eighth into tight perspective." I'll go so far as to give him 2 degrees; it should be a piece of cake.

I can't wait to hear more about the tortures of sonic righteousness.

LANCE SMITH  
Eden Prairie, MN

I read with growing alarm the recent column by Ralph Hodges on "VTA Enlightenment," wondering what sonic mischief my own pickup was playing. What a relief to realize that it was in the April issue!

JOHN HANSON  
Kitchener, Ontario

## Videodisc Players

I enjoyed reading Chris Albertson's May "Video Basics" on videodisc players. I recently opened a LaserDisc-only video store, The Laser's Edge, in southern California, one of the few of its kind in the entire Los Angeles area. We rent and sell all the LaserDiscs available, and we sell the hardware to support the software. I firmly believe that the LaserDisc is the video format of the

future. In fact, the optical-disc format is the future.

KIRK LEONHARDT  
Canoga Park, CA

As a LaserDisc enthusiast, I was pleased to see Chris Albertson's May column about the format. Still, I'm deeply concerned about its future. Pioneer seems unwilling to lift a finger to help this deserving and high-quality format avoid extinction as a consumer product in the U.S. Pioneer should be more aggressive about getting the discs back into stores. Do something, Pioneer, before it's too late.

PHIL COHEN  
Bay Harbor, FL

*There is some additional support. Yamaha has now introduced two LaserDisc players, and Pioneer is broadening the selection of music on the discs.*

## Not Firsts

The May "Bulletin" incorrectly referred to the album "The Blind Leading the Naked" by the Violent Femmes as their debut. It is only their first major-

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## FUJITSU TEN

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# BSR's Endangered Colossus

Prepare for bone jarring bass and dramatically clear highs from these newly developed 15" 3-way 5 speaker systems that nearly missed their chance to charm an audiophile's ear. BSR moved its dbx and ADC divisions into one facility and these speakers almost became orphans. So now, they're yours at a close-out price.

By Drew Kaplan

It's a shame. But, it's also a great opportunity to get a pair of 15" audiophile loudspeakers with the newest in stereo imaging at a market-breaking price.

Imagine a precisely matched mirror image pair of top-of-the-line BSR speakers that can effortlessly recreate the cataclysmic impact of a full orchestral crescendo at full volume and yet offer flawlessly subtle sound detail to 21,500hz.

You'll thrill to thunderous bass all the way down to 26hz. Incredibly rich, full, vibrant sound at low volume will explode with life as you increase the volume.

But before we examine the front speaker complement, the twin overlapping crossovers and the top mounted sonic placement and ambiance speakers, let's see why they were almost orphaned.

You see, BSR, the half billion dollar electronics giant, is the parent company of two of the best names in up-scale audio, dbx and ADC.

Last year dbx developed a new multi-thousand dollar speaker system called the Soundfield One which lets you sit virtually anywhere in your room and have full stereo imaging and terrific sound.

BSR decided to consolidate ADC and dbx into one building (still 2 companies) and put all its speaker efforts into dbx.

## POOR JACK

Well, while dbx's engineers were off designing their multi-thousand dollar masterpieces, BSR's Senior Acoustical Engineer (he had been Fisher's Chief Engineer for 10 years during its top end component stereo days), was designing BSR's radically new speaker line.

The revolutionary top of the line 15" stereo imaging pair pictured above will let you enjoy superb stereo imaging without sitting directly in front of your speakers.

But unfortunately, in the consolidation move, BSR's speakers went by the wayside, and so did Jack.

**Enter DAK.** After a few fearful negotiations and considering the engineering costs BSR had already expended, they agreed to make the speakers just for DAK.

Because there's virtually no BSR overhead left on these speakers, and the R&D was all but complete, we've gotten these speakers for virtually the component costs plus a little BSR labor.

And don't worry about Jack. BSR had him finish the engineering (they really are great people) and they'll pay him a royalty on each speaker we sell. Besides, by the time you read this, Jack is sure to be snapped up as the Chief Engineer at another esoteric audio company.

## WHAT'S STEREO IMAGING?

Stereo imagery is the logical separation and interaction between channels. It's the successful creation of a panoramic wall or stage of music rather than the confined, easily located 2 speaker sound. **IT'S WHAT'S INSIDE THAT COUNTS**

Imagine the full thunder of a kettle drum, or the pluck of a string bass being explosively recreated in your living room. BSR's 15" sub-bass acoustic suspension driver will revolutionize your concept of low clean bass.



Its magnetic structure weighs a thundering 48 ounces. But that's not all. The magnetic field is developed by the rare earth metal Strontium for state of the art massive but flawlessly controlled bass.

A 38mm voice coil with a 200° centigrade temperature capacity, will handle the most demanding digital or analog recordings. And, a new super rigid cabinet design virtually eliminates coloration due to uncontrolled cabinet resonance.

At low volume, the bass will fill in and envelope you. At high volume, your room, your walls and your neighbors will shake. This is definitely not a speaker system for apartment dwellers.



## MATCHED PAIRS

The mid-range and high end of BSR's speakers are truly unique. Front mounted 8" polypropylene mid-range drivers provide rich sound while top mounted 5" polypropylene mid-range drivers provide an open, lifelike ambiance.

Front mounted exponential horn tweeters provide awesome brilliance to 21,500

hz, while top mounted tweeters enhance separation because they are mounted to the outside edge of each speaker.

So, this system has a specific left and a specific right speaker. You'll find wide, but interactive separation that will vastly widen your ideal listening area.

The imagery will give the illusion of musicians actually playing in front of you. Your music will take on a three dimensional quality. You'll enjoy superb stereo imagery regardless of each speaker's specific placement in your room.

## MORE SPECIFICS

The exponential horn tweeters, both in front and on the top of these systems, employ 25mm rigid phenol diaphragms for stability and accurate response.

Polyamid-imid binders and ferro-fluid coolant allow for a 300% increase in heat dissipation so you can drive the voice coils up to 200° centigrade.

**Now, the mid-range.** Both the 8" front firing and the 5" top firing polypropylene drivers reproduce the mid-range frequencies like no ordinary speakers.

It's amazing that so many speaker manufacturers simply slap in 5" paper mid-ranges to reproduce what's really the major portion of the sound spectrum.

BSR's 8" and 5" polypropylene mid-ranges are rigid, exacting drivers that deliver incredibly pure uncolored sound.

They have matched 25mm voice coils, also protected by ferro-fluid and polyamid-imid to 200° centigrade. They are driven by powerful barium ferrite magnetic fields.

## NOT QUITE FINISHED YET

To prevent phase shift and cancellation, two totally separate crossover networks are employed in these speakers.

Next page please. . .



### ... BSR's Colossus Continued

All frequencies below 800 hz are directed to the 15" woofer. The front system routes frequencies above 800hz to the 8" mid-range to take full advantage of its superb reproduction capabilities. Frequencies above 3400hz are routed to the horn tweeter.

The top mounted system routes only frequencies above 1200hz to the 5" polypropylene ambient mid-range driver, and frequencies above 3400hz are routed to the top sonic placement tweeter.

There are level controls for both the top and front mounted speakers so that you can voice the speakers to match your musical taste and environment.

Note: Only the top tweeters are mounted at the the edges. The front mounted tweeters are conventionally mounted

for acoustical symmetry.

Each speaker is fuse protected for up to 200 watts peak, 150 watts continuous power. You can operate these super efficient speakers with as little as 20 watts.

#### AND OH WHAT A PRETTY FACE

The speaker systems are 30" tall, 19 1/4" wide and 10 1/2" deep. Their lovely oak wood-grain appearance is enhanced by the dark removable grill cloths that beautifully contrast with the rich wood-grain tones. They're a statement of audio elegance when placed in any room. They're backed by BSR's 2 year limited warranty.

#### A COLOSSAL DREAM COMES TRUE RISK FREE

You'll hear depth of sound at low levels that was previously unobtainable. And yes, when you crank up the volume, your music will explode with realism and drama.

Try these speakers in your own system. Then compare them at any Hi-Fi Store with any pair of speakers up to \$1000. If they don't beat all the competition hands down, simply return them to DAK in their original boxes within 30 days for a courteous refund.

To order your matched pair of BSR top-of-the-line 15" 3-way 5 speaker systems with unique stereo imaging risk free with your credit card, call toll free or send your check for DAK's market-breaking price of just \$298 for the **MATCHED PAIR** plus \$22 for Postage and Handling. Order No. 4352. CA res add tax.

It's a dream system for an audiophile. Sonically pure, thunderously powerful, these BSR speakers will make your future listening years an on-going fabulous, if not earthshaking experience.



**So, your spouse or neighbors aren't into thunder and paint peeling audio. Don't worry, BSR has developed two smaller but still mighty versions of the colossus that use the same basic components, at incredible prices.**

Don't despair. You won't be relegated to 'little sound' by these more sane versions of the Colossus. After all, a 15" 3-way system is usually a distant dream of only the most ardent audiophile.

#### 10" 3-WAY SANE COLOSSUS

You will experience the same dramatic highs to 21,500hz produced by the identical exponential horn tweeters with the same rigid phenol diaphragms. There's even a variable brightness control.

And, don't look for any cheap paper mid-range speakers. You'll thrill to rich, full, incredibly pure music from a 5" rigid polypropylene mid-range driver.

The 10" woofers utilize a massive Strontium magnetic structure and can reproduce dramatically clean, massive bass down to 32hz. Unless you actually set these speakers next to the Colossus, you'd think the bass is incomparable.

The crossover points are at 1200hz and 3400hz. The speakers are rated for 90 watts peak and 45 watts continuous power and require at least 15 watts.

If you're a normal audio person, you'll be thrilled with these as main speaker systems for your stereo. But, if you're a slightly crazy DAK-type audiophile, the big Colossus Systems add a thrill to your music that goes far beyond printed specs.

These speakers are 23 3/4" tall, 13 3/4" wide, and 8 3/4" deep. Their rich oak wood-grain appearance which surrounds the contrasting dark grill cloth, will be an elegant addition to any room.

#### 8" BOOKSHELF COLOSSUS

Where space is a consideration, your music need not suffer. BSR's newest 2-way 8" systems provide an astounding level of musical fullness.

BSR's exponential horn tweeter produces superb highs to 21,500hz. The 8" woofer/mid-range produces bass down to a very respectable 38hz and powerfully clean mid-range up to 2500hz.

On the floor or in a bookcase, these speakers will give you years of full rich beautiful sound. They are just 19 3/4" tall, 11 3/4" wide and 8 3/4" deep. Their rich oak wood-grain appearance which surrounds the contrasting grill will be a beautiful addition to any room.

All BSR speaker systems are fuse protected and backed by BSR's standard 2 year limited warranty.

#### TRY RICH DRAMATIC SOUND RISK FREE

These smaller versions of the Colossus may have a hard time competing with the awe inspiring sonic violence of their bigger brother. But, compared with tra-

ditional speakers, you'll find they've gained greatly by their genetic origin.

If you're not 100% satisfied, simply return them to DAK within 30 days in their original boxes for a refund.

To order the 10" 3-way Sane Colossus with its horn tweeter, polypropylene mid-range and 10" Strontium woofer risk free with your credit card, call toll free, or send your check for DAK's breakthrough price of just \$69 each plus \$9 P&H each. (2 required for stereo). Order No. 4348.

To order the 8" 2-way Bookshelf Colossus with its exponential horn tweeter and 8" Strontium woofer/mid-range risk free with your credit card, call toll free, or send your check for DAK's breakthrough price of just \$44 each plus \$6.50 P&H each. (2 required for stereo). Or. No. 4347.

These speakers have gained a great deal from their big brothers. They'll bring you years of superb musical sound and add truly elegant visual appeal to any room.



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## LETTERS

label release. The group previously released "Violent Femmes" and "Hallowed Ground" on Slash Records.

JONATHAN KULICK  
Swarthmore, PA

David Hall's June review of the new recording of Strauss's *Don Quixote* by Yo-Yo Ma and the Boston Symphony under Seiji Ozawa stated that it "appears to be the Boston Symphony's first recording for CBS since the Thirties." Wrong! Ozawa and the BSO backed Isaac Stern on a Mendelssohn Violin Concerto recording in 1981 or so, then Frederica von Stade on a Ravel recording and a Debussy/Berlioz one.

JUDITH ANN MILLER  
Dayton, Ohio

### *CD Converts—and a Critic*

I am a recent convert to Compact Disc digital audio. I have considered myself an audiophile for fifteen years, and I have never heard any single advancement in stereo hi-fi that has made such an improvement in sound, not to mention freedom from annoying vinyl surface noise. Anticipating my

eventual conversion to the CD format, I had not purchased an LP for two years, and now I will probably never purchase another, at least for the purpose of playing it myself.

ARTHUR DORY  
Akron, OH

After a year of waiting to see if it would take the route of quad, I made the plunge and joined the Compact Disc revolution. Boy, am I glad I jumped in—a good CD recording gives me the sensation that something special is happening and I'm there to share it.

All is not total happiness, though. I've been disappointed to find how many new releases—and, worse, how many old recordings rereleased on CD—have not been remastered to take full advantage of this new format. Its big advantage, to me, is the wide dynamic range it makes possible. An analog-mastered CD sounds like a new LP—except it costs twice as much. A good deal of the time I find they don't even include the three or more extra tracks the CD has room for!

STEVEN B. GERKEN  
New Orleans, LA

*Most LP's do not contain the maximum amount of music that could be accommodated.*

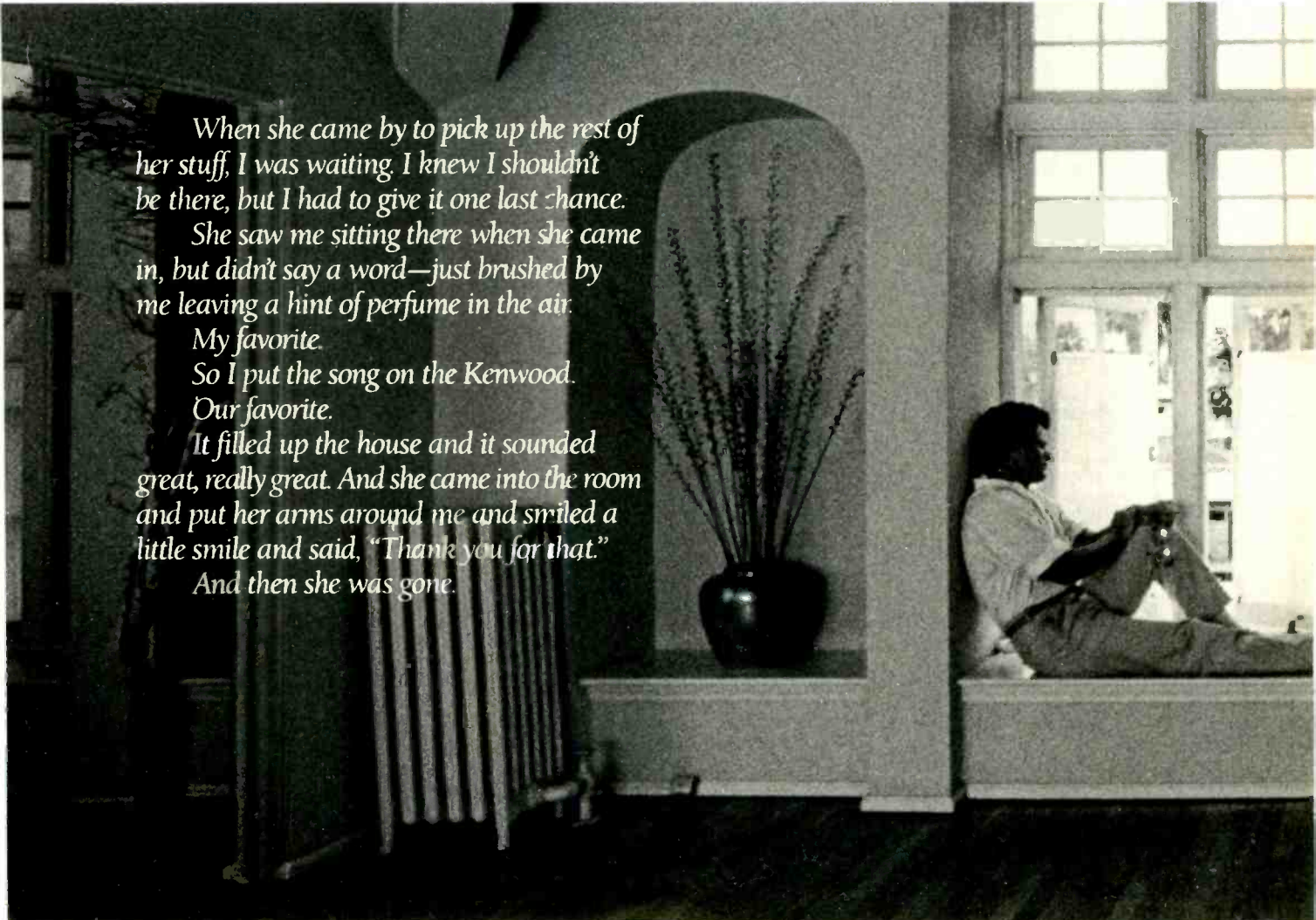
In his May article on "How to Buy a CD Player," William Livingstone claims that the problem of a limited selection of music on CD's has been overcome. He was joking, wasn't he?

I suppose there is plenty to choose from if all you listen to is classical or Top 40 pop, but what about other types of music? You can probably count the available reggae CD's on the fingers of one hand. Try to find a blues CD. As for New Music (or New Wave), the selection is a little better, but a substantial portion of the titles on CD are still only available as imports at nearly \$20 each. I'd rather sacrifice some sonic quality and buy the LP for about \$8.

So until the manufacturers *really* improve the selection of CD's—and, for that matter, make prices a bit more competitive with LP's—I'll hold off on buying a Compact Disc player.

RON DAVIDSON  
Cheektowaga, NY

*Are you depriving anyone but yourself?*



*When she came by to pick up the rest of her stuff, I was waiting. I knew I shouldn't be there, but I had to give it one last chance.*

*She saw me sitting there when she came in, but didn't say a word—just brushed by me leaving a hint of perfume in the air.*

*My favorite.*

*So I put the song on the Kenwood.*

*Our favorite.*

*It filled up the house and it sounded great, really great. And she came into the room and put her arms around me and smiled a little smile and said, "Thank you for that."*

*And then she was gone.*

## Canoe Stereo

Hi-fi stereo sound in a car is okay, hi-fi stereo in the home is nice, but hi-fi stereo in a canoe is the best way to go. There are no walls or objects to block or distort the sound. The wide openness of a lake lets the system and your ears breathe, and you can hear certain passages of music you can't hear on your home system because your listening room is too cramped sonically.

Choose the best car stereo equipment your money can buy. Don't buy cheap equipment. The extreme quietness (wide dynamic range) of a lake environment will make the sonic problems of cheap equipment or software readily audible. Lots of amplifier power is as important as your paddle. Your canoe will act something like a speaker enclosure. A cedar-strip canoe is ideal; bare, uninsulated aluminum canoes are not advisable.

Mount your components in a fold-out wooden case, which can be folded closed for those long portages—and be sure it is rainproof. Place your speakers in the front and back of the canoe for good imaging. For a power supply I rec-

ommend a deep-cycle 12-volt RV storage battery. Ordinary car batteries are not suited for deep discharge-recharge cycles. Put stereo in your canoe—it's a whole new listening experience.

GLENN TREML  
Thunder Bay, Ontario

## More, Please

MORE record reviews. All kinds. I have eclectic tastes, and your reviews are fair and reasonable.

S. PELESHAK  
Vanderhoof, British Columbia

## VCR Listening Tests

I must take exception to the April article on "The Sound of Video." The test procedures and results were on a par with your other very good and informative product testing, but the generalizations made about the test results were very, very misleading. How can you justify claiming that VHS Hi-Fi is superior in sound quality to Beta Hi-Fi after testing only *one* brand and model in each format? And then in the May issue Technical Editor Gordon Sell

is quoted (in "Speaking My Piece") as saying, "Home video has a way to go in terms of sonic development to meet audiophile standards."

It's also interesting that you chose musical material for the tests that would bring out the *worst* in the products tested. Give a listen to the Sony SL-HF900. Maybe you guys are afraid to change your name to *Stereo-Video Review*, but the time has come.

JOHN N. FROST  
Chicago, IL

*Mr. Frost, we've got a few belligerent readers we'd like you to meet.*

## Credit Is Due

Photo credits were inadvertently omitted from the article "Maxine Sullivan: An American Classic" in June. The color portrait of Sullivan on page 99 was taken by Marc Bryan-Brown, who also did the shot of Sullivan with Burton Lane on page 100. The vintage publicity photo also on page 100 was by Bruno of Hollywood, and the location shot of Sullivan at the Vine Street Bar on page 101 was taken by W. G. Harris.

The wonder of a great stereo system is its ability to take music and make it almost tangible. In the rarified moments of life, this ability can be especially powerful. Even ironic.

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# NEW PRODUCTS

## Technics

The 50-watt SA-290 AM/FM receiver from Technics has inputs for a tape deck, a CD player, and a turntable. The sixteen station presets can either be programmed automatically according to signal strength or assigned manually. Slider controls adjust bass, treble, balance, and volume. Other features include tape-monitor and loudness-compensation switches, main/remote speaker selection, and a fuseless electronic protection circuit. An LCD display indicates the received frequency, band, preset number, and stereo or mono mode. LED's show power level, source selection, and signal strength. The SA-290 is rated for at least 50 watts per channel continuous rms output into 8 ohms (both channels driven) from 20 to 20,000 Hz, with no more than 0.3



percent total harmonic distortion. Dimensions are 16 $\frac{1}{16}$  inches wide, 3 $\frac{1}{16}$  inches high, and 9 $\frac{1}{16}$  inches deep. Price: \$250.

Technics, Dept. SR, One Panasonic Way, Secaucus, NJ 07094.  
**Circle 120 on reader service card**



## RCA

RCA's FMR570 square-cornered 20-inch video receiver/monitor decodes stereo sound and SAP broadcasts. The symmetrical cabinet houses two 5-inch oval speakers with separate built-in amplifiers rated at 5 watts (minimum continuous rms output, both channels driven, into 8 ohms from 50 to 15,000 Hz, with no more than 1 percent total harmonic distortion). There are additional audio outputs with adjustable levels for connection to an external amplifier and

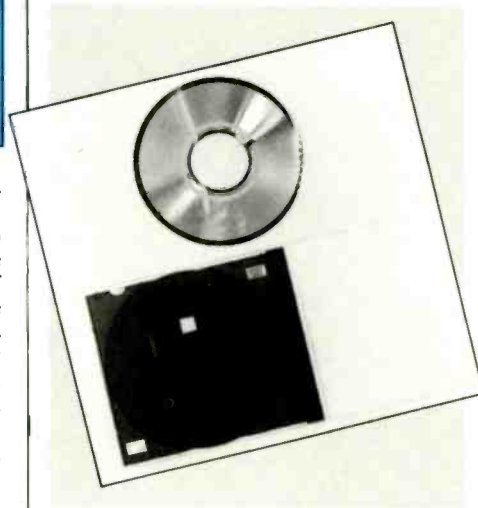
speakers. Video sources such as VCR's and videodisc players can be selected with the remote control, which also operates compatible RCA VCR's. The video tuner receives all VHF and UHF channels or up to ninety-four cable channels, and all the available channels can be programmed into memory by pushing one button on the set's control panel. The receiver/monitor is finished with ebony or oak trim. Price: \$599. RCA, Dept. SR, 600 N. Sherman Dr., Indianapolis, IN 46201.

**Circle 122 on reader service card**

## AudioSource

The AudioSource LLC-One CD-player lens cleaner is said to clear away "such airborne contaminants as dust, smoke, or moisture" that may have become deposited on the lens. According to AudioSource, such contaminants can make a player "prone to distortion, mistracking, and unnecessary engagement of error-correction circuitry." The LLC-One consists of a disc with a small carbon-fiber brush attached that is designed to clean effectively without damaging the lens surface. The user inserts the LLC-One in the CD player and presses play. The disc is encoded to stop the player automatically after one cleaning cycle. Price: \$26.95. AudioSource, Dept. SR, 1185 Chess Dr., Foster City, CA 94404.

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# Impress Your Speakers

Let's face it—car speakers can be pretty blasé! It takes sheer gut-wrenching power to impress them, and Cooustic car amplifiers deliver just that, along with amazing clarity and solid resolution.

Your speakers will be pleased to know that Cooustic power amplifiers use 20-mil copper clad G-10 glass epoxy PC boards, 10 gauge power and ground wire, high speed HEX-FET® switchers, plus fully complimentary 150-watt 15-amp darlington audio outputs. If that doesn't perk up their tweeters, tell them the AMP-190 and AMP-380 audio inputs directly accept 8-pin din and RCA connectors, low power or high power radios by simply flipping a switch.

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This means it is not necessary for you to buy two power amplifiers to drive your speakers when the AMP-190/AMP-380 can produce double the power of most other car amplifiers...that's twice the power for virtually half the price.

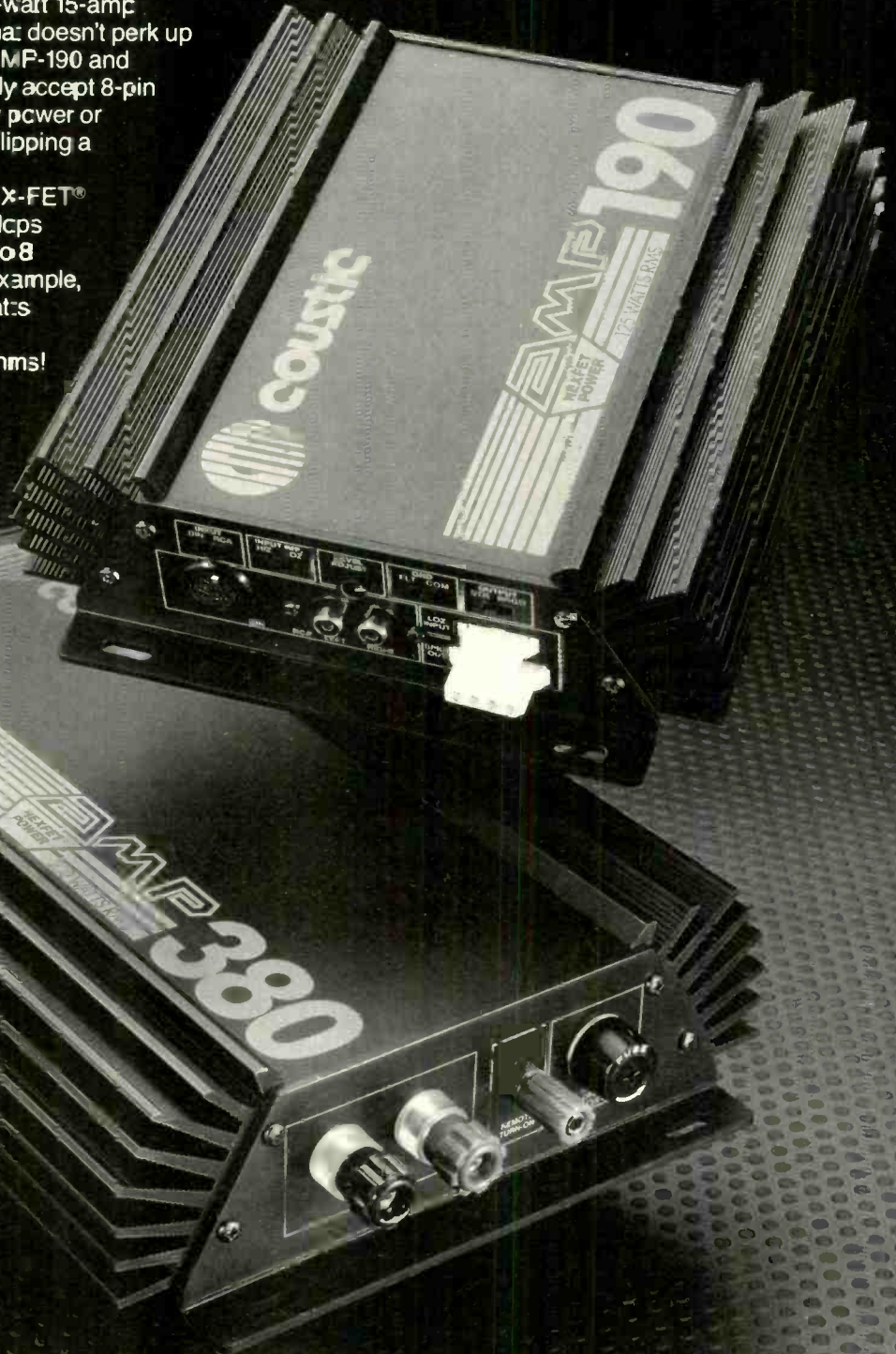
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CIRCLE NO. 58 ON READER SERVICE CARD



by Larry Klein



## Passive Radiators

**Q** Some high-fidelity speaker systems use "passive radiators," which seem to be woofers without voice coils or magnets. Can you explain their purpose and how they work?

DAVID F. KNIGHT  
Portland, OR

**A** To appreciate the purpose of a passive radiator, you first need to understand how a woofer interacts with its enclosure. Every mechanical system with compliances (flexibilities) and mass has one or more resonant frequencies. A woofer cone's resonant frequency in free air is determined by the compliance of the cone suspension and its mass (weight). When a woofer is installed in an enclosure, the air inside the box "loads" its cone, thereby decreasing its compliance and raising its resonant frequency.

In an *acoustic-suspension* system, the woofer cone is designed to have a relatively floppy suspension, which results in a fairly low free-air resonant frequency. The pneumatic load of the box provides much of the subsequent suspension stiffness and shifts the cone resonance up to the desired frequency.

The operating principle of the *bass-reflex* (or *vented* or *ported*) speaker enclosure is somewhat more complex. If you took a speaker-size box and put a single large hole in it—but no speaker—you would create a tuned system known as a "Helmholtz resonator." (The tone a glass bottle produces when you blow across its mouth is the bottle's Helmholtz resonance.) The box's resonant frequency is determined by its internal

volume, which serves as the air spring, and the characteristics of the hole or port, which provides the mass. Helmholtz resonators are sometimes used to absorb unwanted low-frequency energy in control rooms and other critical acoustic environments.

In a bass-reflex speaker system, which is a Helmholtz resonator with a woofer installed, the port is usually designed to tune the box to the woofer's resonance. If everything is properly adjusted (and there are now computer programs to help out), the woofer's response peaks are flattened and the air resonating in the enclosure—rather than the woofer cone's movement—provides most of the very-low-frequency acoustic output of the system.

Now, finally, we come to the role of the passive radiator. It provides an optimum match between the resonant characteristics of the enclosure and the woofer by serving as a port with precisely adjusted mechanical and acoustical properties. When the design is correct, the result is a low-distortion, non-boomy, extended bass response.

## Low-Bass Specs

**Q** I am building a small recording studio in my home, and I'm confused about monitor speakers. Why is it that some of the most expensive and highly acclaimed speakers have such poor low-frequency responses? For example, some speakers costing upwards of \$600 a pair are rated for a response down to only 50 Hz, while less expensive speakers might specify a response down to 25 Hz. What's the explanation for the discrepancy?

JIM PORTER  
Olympia, WA

**A** A speaker system that accurately reproduces a pure 25-Hz sine wave creates a sensation of pressure rather than sound. In most cases, however, the 25-Hz test signal will be accompanied by large amounts of spurious higher frequencies (50 and 75 Hz) that may sound like bass but are really second- and third-order harmonic distortion. This harmonic distortion is caused by break-up (flexing) of the woofer cone and nonlinearities resulting from its excessive excursion.

Manufacturers that claim a bass response down to 25 Hz for modestly priced systems may simply be indicating that a 25-Hz signal fed into their speakers will provoke some "response"—but with no guarantee that the output signal will bear any resemblance to the input signal.

Also keep in mind that a frequency-response specification is absolutely meaningless without some indication of the range of variation, such as  $\pm 3$  dB.

This is not to say that even when such data are presented, the specification describes the way a speaker is likely to sound in a typical listening room. For that you would need information on dispersion characteristics, acoustic power response, and other factors that are never found in ads and seldom encountered in sales brochures. I don't mean to imply that clean, very-low-frequency response is not available from today's speaker systems, but it doesn't come cheap.

## Groove Jumping

**Q** I have a large collection of late-Sixties rock-and-roll records. Most are in good shape except for some warpage here and there. I recently bought a new phono cartridge, hoping to minimize groove wear, but it jumps grooves on some of my records. I switched back to my old cartridge and they play fine. Is my new cartridge defective?

JOSEPH CAMPBELL  
Fairfield, NJ

**A** No, your new cartridge probably isn't defective, but it is causing the problem. To understand what's happening, you need to know something about resonance and how it works. Every mechanical system has resonances, which are the frequencies at which the system tends to vibrate. The frequencies are determined by the masses and compliances of the parts involved. (The "compliance" of a mechanical part can be thought of as its flexibility.)

Every cartridge/tonarm combination has several resonances determined by the distribution of flexibilities and masses in the system. A major low-frequency resonance results from the interaction of the stylus compliance with the effective tonarm mass—which includes the mass of the cartridge body. The higher the compliance of a cartridge's stylus assembly, the lower the resonant frequency with a given tonarm; the higher the tonarm mass, the lower the resonance with a given cartridge. A low-compliance cartridge in a low-mass tonarm will result in an excessively high resonant frequency; a high-compliance cartridge in a high-mass arm will result in an excessively low frequency. A high-compliance cartridge in a low-mass arm will work out just fine.

The response peak resulting from a high resonant frequency (say, 15 to 20 Hz) may not be audible on most program material, but it is likely to increase a record player's sensitivity to acoustic feedback and external vibration. It may also cause woofer-cone flutter in vented speaker systems. On the other hand, an excessively low resonant frequency

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		BLUE THUNDER	1517042	STRIPES	1513162	ROCKY	0563172	THE BLACK STALLION	0504012
				THE VEROICT	0760002	TRADING PLACES	2017152	REAL GENIUS	1802082
				SATURDAY NIGHT FEVER	2020102	AMERICAN GIGOLO	2030002	COUNTRY	5341072
				THE GREATEST STORY EVER TOLD	0855062	GANDHI	1533042	GHOSTBUSTERS	1742012
				SILKWOOD	3136072	BUTCH CASSIDY & THE SUNDOANCE KID	0517302	SPLASH	5304022
				TEEN WOLF	4104072			FUNNY GIRL	1511002
				YENTL	0895082				
				ANNIE	1516052				
				SOPHIE'S CHOICE	0754082				
				RICHARD PRYOR—LIVE ON THE SUNSET STRIP	1603092				
				A NIGHTMARE ON ELM STREET	3288072				
				STAGECOACH	7113252				
				SUMMER RENTAL	4173032				
				TRUE GRIT	2028122				
				SILVERADO	1810082				
				THE TEN COMMANDMENTS	2026062				
				TOOTSIE	1509042				
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FOOTLOOSE	2019052	STARMAN	1723042						
MICKI AND MAUDE	1732032	CABARET	4001272						
THE BIG CHILL	1527022	EDUCATING RITA	1593012						
THE COTTON CLUB	3100032	FLASHDANCE	2018142						
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# AUDIO Q. AND A.

(say, below 6 Hz) can increase a player's sensitivity to external shock and—here we finally come to the source of your problem—record warps. Since a tonearm and stylus tend to vibrate violently at resonance, the stylus tracking force at that frequency fluctuates wildly between too high and too low. In fact, assisted by the warp, the tracking force can hit zero, at which point groove contact is lost. And even if the stylus never totally leaves the groove, the loss of stylus force during the periods of infrasonic resonance can cause severe distortion of the audio frequencies.

More than ten years ago, Shure Brothers undertook a research project on the effect of warps on the record-playing process, and much of the following data is derived from that report. Record warps come in various shapes and sizes; some are an unsolicited gift from the pressing plant, while others result from bad storage conditions. Warps can be rated by amplitude/velocity and frequency, the frequency being determined by how rapidly the turntable moves the warp beneath the playing stylus.

To prevent the tonearm/cartridge resonance from being triggered by warps,

most of which occur in the range below 6 Hz, it's good engineering practice to design for a resonance above 6 Hz. And since the recorded audio frequencies start around 20 Hz, it's also a good idea to place the resonance below 20 Hz. Engineers aim at the vicinity of 10 Hz or so as a good compromise frequency. Whatever the resonant frequency, the arm or cartridge can help absorb the resonant energy in much the same way that shock absorbers damp the bounces in a car's suspension system.

The reason your new cartridge has trouble tracking warps that didn't bother your old one is that the new cartridge is heavier or more compliant, which shifts the arm/cartridge resonant frequency downward into the warp-danger zone. The obvious solution is to use a cartridge whose compliance and weight more closely resemble the compliance and weight of your old one, which apparently was compatible with your tonearm.

The moral of the story is that neither a cartridge nor a tonearm should ever be chosen in isolation. They must be selected as a compatible team to ensure that their interacting masses and com-

pliances resonate somewhere in the desired range of frequencies.

## 16-Ohm Speakers

**Q** My old tube receiver is on its last legs and I'm about to replace it. But most transistor receivers are rated at 8 ohms, and my JBL speakers have a 16-ohm impedance. Will today's receivers drive my 16-ohm speakers without distortion, volume, and frequency-response problems?

LOUIS SCHMITT  
Hilton Head, SC

**A** Amplifiers do not put out wattage. What they really do is apply voltage across the load, which is either a test resistor or speaker. If an amplifier is capable of applying, say, 20 volts across an 8-ohm speaker load, that translates, using Ohm's Law, into 50 watts. The same 20 volts applied to a 16-ohm load would produce 25 watts. What this means is that if you buy a new receiver that has at least double the amplifier power of your old tube unit, you should have no problem driving your 16-ohm speakers.

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The Discwasher® D4+™ Record Care System features a unique fluid and special directional micro-fiber pad to clean your records safely and effectively. It picks up the grubbies without leaving behind any residue.

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340323. Sade—Promise. #1 Smash (Portrait)
263293. Bolling: Suite For Flute & Jazz Piano—Rampal, Bolling (Columbia)
339226. Gershwin: Rhapsody In Blue; Second Rhapsody; etc.—M. Tilson Thomas, Los Angeles Phil. (Digital—CBS Masterworks)
338616. Miami Vice—Music From The Television Series. G. Frey: #1 You Belong To The City; many more. (MCA)
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323261. Lionel Richie—Can't Slow Down. All Night Long; Stuck On You; Hello; etc. (Motown)
335547. Berlioz: Symphonie Fantastique. Barenboim, Berlin Phil. (Digital—CBS Masterworks)
331264. Bryan Adams—Reckless. #1 hit: Heaven; Run To You; etc. (A&M)
339903. The Cars—Greatest Hits. Tonight She Comes; more. (Elektra)
341263. Enoch Light & The Light Brigade—Big Bands Of The Thirties. Begin The Beguine; more. (Project 3)
322008. Linda Ronstadt & The Nelson Riddle Orch.—What's New. (Asylum)
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337279. Plácido Domingo—Save Your Nights For Me. Love songs. (CBS)
318089. Michael Jackson—Thriller. Billy Jean; The Girl Is Mine; etc. (Epic)
- 288670-398677. Barry Manilow—Greatest Hits. It's A Miracle, Mandy; etc. (Counts as 2—Arista)
322024. Huey Lewis & The News—Sports. Bad Is Bad; etc. (Chrysalis)
314443. Neil Diamond's 12 Greatest Hits, Vol. 2. You Don't Bring Me Flowers (with Barbra Streisand); etc. (Columbia)
343624. Wynton Marsalis Plays Trumpet Concertos. Haydn, Hummel, L. Mozart. (Digital—CBS Masterworks)
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331645. Madonna—Like A Virgin. #1 album & hits Material Girl; Angel. (Sire)
328435. Prince And The New Power Generation—The Love Symbol Album. #1 hit: When Doves Cry. (Warner Bros.)
316604. Tchaikovsky: 1812 Overture; Marche Slave; Beethoven: Wellington's Victory. Lorin Maazel, Vienna Phil. (Digital—CBS Masterworks)
321380. Barbra Streisand's Greatest Hits, Vol. II. The Way We Were; You Don't Bring Me Flowers; etc. (Columbia)
343715. Vivaldi—Four Seasons. Maazel, National de France (Digital—CBS Masterworks)
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**How the Club works.** About every four weeks (13 times a year) you'll receive the Club's music magazine, which describes the Selection of the Month for your musical interest... plus many exciting alternates.

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Selections with two numbers contain 2 CDs and count as 2—so write in both numbers.

have at least 10 days in which to make your decision. If you ever receive any Selection without having 10 days to decide, you may return it at our expense.

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My main musical interest is (check one):

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Do you have a VCR? (Check one.)  Yes  No

Do you have a credit card? (Check one.)  Yes  No

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M7X/NZ

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# RECOG

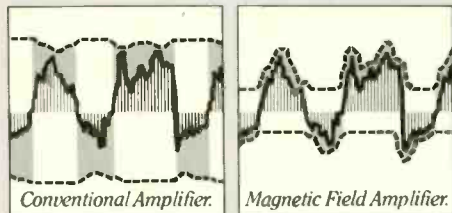
## Why the Carver M-500t Magnetic Field Power Amplifier has helped begin an industry trend and how it has stayed ahead of its inspired imitators.



Twice in the last decade, Bob Carver has taught the high fidelity industry how to make amplifiers that give you better performance and value. Both times his bold lead has attracted followers. Still, as evidenced by the current release of the M-500t, Carver sets standards yet unequalled in the audio community.

With its astonishingly high voltage/high output current and exclusive operation features, it is a prime example of why Carver remains the designer to emulate:

- Continuous FTC sine-wave output conservatively rated at 250 watts per channel.
- Produces 600 to 1000 watts per channel of dynamic power for music (depending on impedance).
- Bridging mode delivers 700 watts continuous sine-wave output at 8 ohms.
- High current Magnetic Field power supply provides peak currents up to  $\pm 100$  amps for precise control of voice-coil motion.
- Designed to handle unintended 1 ohm speaker loads without shutting down.
- Equipped with infinite resolution VU meters.



Solid line: audio output signal.  
Broken line: power supply voltage.  
Shaded area: wasted power.  
Vertical lines: power to speakers.

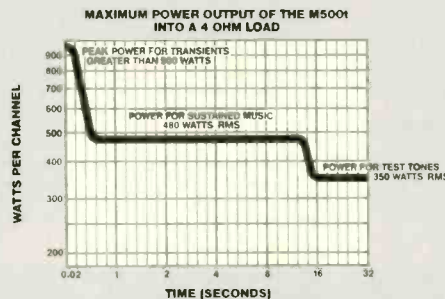
### POWER EXPRESSED BY THE DEMANDS OF MUSIC.

The Carver M-500t Power Amplifier responds to musical transients with better than 600 watts per channel of instantaneous peak power through 8 ohm speakers. Well over 900 watts per channel into 4 ohm speakers.

And yet its Federal Trade Commission Continuous Average Power Rating is 250 watts per channel into 8 ohms.

The gulf between the two power ratings represents Bob Carver's insistence that amplifier design should fit the problem at hand. That problem is reproducing music with stunning impact, not simply satisfying a sine-wave test which doesn't even include speakers or sound sources. Hence the seeming gulf between the two ratings.

Bob reasoned that since music is composed of three basic types of power waveforms, those types of waveforms are what an amplifier should be designed to satisfy.



The Carver M-500t delivers massive power at three important output levels.

First there are instantaneous peak transients—the sudden smash of cymbals, drums, or the individual leading edge attack of each musical note. While these waveforms last less than 1/100 of a second, they form the keen edge of musical reality which must be present if you are to realize high fidelity. Though momentary, they also demand a tremendous amount of amplifier power.

Directly following instantaneous transients are combinant musical crests of demand that come from multiple instruments and their harmonics. These long term power demands may last up to several seconds but usually come and go in less than a second. And yet they can tax anything but an exceptionally powerful amplifier.

The third type of power demand is represented by the average power contained in the music, and is approximately one third to one half of the FTC continuous power rating.

At extremely high output current levels, the Carver M-500t not only delivers over 700 watts of instantaneous peak power for instantaneous transients, but can deliver over 600 watts

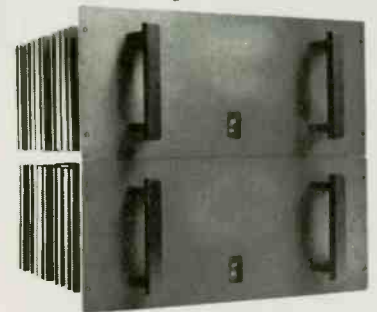
RMS of long term power for demands lasting up to several seconds. The M-500t provides more power, more current and more voltage than any comparably priced amplifier ever offered.

### THE MAGNETIC FIELD AMPLIFIER VS. CONVENTION.

Audiophiles, critics and ultimately other manufacturers have each accepted the wisdom of Bob Carver's fresh approach to delivering power in musical terms. Yet only Carver has so elegantly translated theory into practice.

Rather than increase cost, size and heat output with huge storage circuits, Magnetic Field Amplification delivers instantaneous high peak and longterm power from a small but powerful Magnetic Field Coil. The result is an amplifier capable of *simultaneous* high current and high voltage that can do sonic justice to the dynamics of Compact Discs and audiophile records in a compact, cool-running design. An amplifier costing considerably less than the ultra-esoteric models which figured significantly into the genesis of its circuitry. For a reprint of the full story of its development as well as a catalog of Carver high fidelity audio components please call or write to us.

Figure 1



This \$7,000 pair of esoteric amplifiers figure significantly into the heritage of the M-500 "t" version circuitry.

Figure 1 above shows a \$7,000 pair of ultra-esoteric mono amplifiers. No expense was spared on their admittedly magnificent but still conventional design and construction.

Figure 2 shows the massive toroid output transformers contained in these prestigious audiophile designs. At 10% regulation, their output current is  $\pm 50$  amperes.

All conventional amplifiers are condemned to using this type of design.



# ATION.

Figure 2 also shows the patented Magnetic Field Coil employed in the Carver M-500t. Its output current is  $\pm 100$  amps at 10% regulation!!!!

Figure 2



Over 40 pounds of toroid coils put out half the current of a single six pound, four ounce Magnetic Field Coil.

## DISTINGUISHING FEATURES OF THE CARVER M-500t.

Power is mandatory for dynamic impact and musical realism. And yet power requires control and finesse. While the Carver M-500t isn't the only amplifier to deliver adequate output, it is one of the few that tempers force with protection circuits beneficial to both the amplifier and your loudspeaker system.

◆ These include DC offset, short circuit power interrupt as well as two special computer-controlled speaker monitor circuits which protect against excessive high frequency tweeter input and an overall thermal overload.

◆ The Carver M-500t continuously displays power output through dual, lighted infinite resolution VU-ballistic meters. Meters which can react to musical transients as brief as 1 millisecond.

◆ The M-500t is quiet. Inside and out. Its circuitry has the best signal-to-noise ratio of any production amplifier. Better than  $-120$ dB. And, in spite of its massive output capability, the M-500t does not require a noisy fan to dissipate heat. Thanks to the cool running Magnetic Field Amplifier circuitry.

◆ No other amplifier in the M-500t's price or power ranges is capable of handling problematic speaker loads as low as 1 ohm. Whether required by certain brands of speakers, or inadvertently derived by pairing too many low impedance speakers at one set of output terminals, all conventional amplifiers simply shut down or blow their fuses when faced with this condition.

◆ In stereo use, both channels of the M-500t can actually borrow from each other during unequal output demands. In addition, Carver amplifiers have pioneered phase inversion circuitry which takes advantage of the in-phase (mono) characteristics of bass to essentially double available power supply current at low frequencies.

◆ Finally, the Carver M-500t can be used in a bridged mode as a 700 watt RMS per channel mono amplifier without any switching or modification.

## MUSIC IS THE FINAL PROOF.

Were you to buy a power amplifier solely on features and performance specifications, painstaking comparison would inevitably lead you to the Carver M-500t.

But we are sure that your final judgment will be based on musicality. It is here that the M-500t again distinguishes itself.

Bob Carver has carefully designed the M-500t to have a completely neutral signal path that is utterly transparent in sonic character. The result is more than just musical accuracy. It means a total lack of listener fatigue caused by subtle colorations sometimes exhibited by conventional amplifier designs, regardless of their power rating.

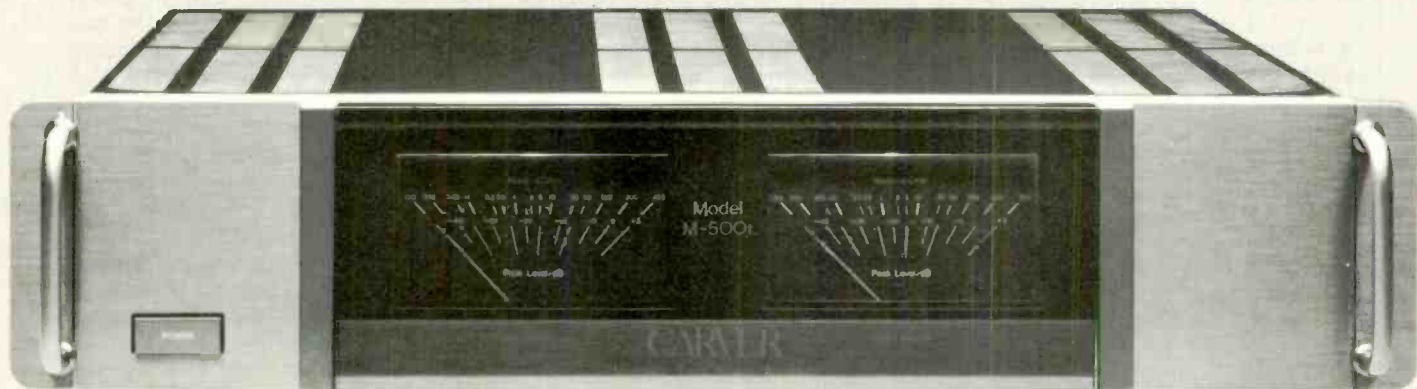
It means a veil is lifted between you and your musical source as the most detailed nuances are revealed with realism, believability and delivered with stunning impact.

## VISIT YOUR CARVER DEALER FOR A SURPRISING AUDITION.

We invite you to audition the Carver M-500t soon. Against any and all competition. Including those who are only now embracing the principles which Bob Carver has refined over the last several years.

We doubt that you will be surprised when the M-500t lives up to the claims made in this advertisement. What will surprise you is just how affordable this much power, musicality and accuracy can be.

**SPECIFICATIONS:** Power, 251 watts per channel into 8 ohms 20Hz to 20kHz, both channels driven with no more than 0.15% THD. Instantaneous Peak Power, 1000 watts into 2 ohms, 950 watts into 4 ohms, 600 watts into 8 ohms. Longterm RMS Power for Music, 500 into 2 ohms, 450 into 4 ohms, 300 into 8 ohms, 1000 watts bridged mono into 4 ohms, 900 watts bridged mono into 8 ohms. Bridged Mono RMS Continuous Power, 700 watts continuous into 8 ohms. Noise  $-120$ dB IHF Weighted. Frequency Response,  $\pm 0-3$ dB 1Hz-100kHz. Slew Factor, 200. Weight, 25 lb. Finish, light brushed anthracite, baked enamel, black anodized.



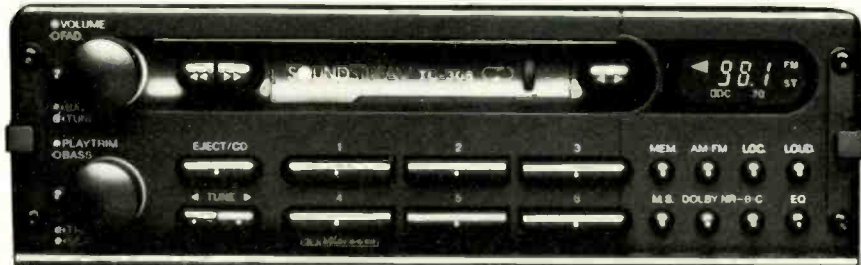
# CARVER

POWERFUL

MUSICAL

ACCURATE





## SOUNDSTREAM TC-308

by Julian Hirsch and Christopher Greenleaf

**T**HE Soundstream TC-308 AM/FM tuner and autoreverse tape player has three especially welcome features: a CD/auxiliary stereo input jack, a tape playback-response adjustment called Playtrim, and a chassis that can be removed from its fixed dashboard housing to protect against theft. From its gold-plated line-level jacks for external power amplifier(s) to the uncluttered layout of its front-panel control buttons, the TC-308 is a well-detailed, handsomely designed head unit.

The tuner section of the TC-308 was designed by consultant Larry Schotz, well known for the innovative high-performance tuners he has designed for other manufacturers. Its quartz-controlled phase-locked-loop (PLL) synthesizer is tunable in steps of 100 kHz for FM or 10 kHz for AM. In its auto-scan mode, the tuner scans the FM band and pauses for 5 seconds on each receivable signal before proceeding. The scanning threshold can be set to intercept either distant or local stations, and for AM reception the same switch inserts an input attenuator to prevent front-end overload by strong local stations.

The FM tuner has automatic signal-controlled channel-blending and high-cut filter circuits and a soft-muting circuit that gradually reduces the volume as signals grow weaker. These circuits are designed to minimize noise bursts and similar distracting sounds during mobile FM reception while retaining listenable stereo performance.

The preamplifier, which supplies line outputs for both front and rear

speakers, has bass and treble tone controls, loudness compensation, and a switchable CD input for connection to a portable CD player. When a cassette is loaded into the TC-308, it takes priority over the other sources; if the tuner is on, its output replaces the tape playback during fast winding or when the tape is ejected. Pressing the EJECT/CD button when no tape is loaded switches the preamplifier to the CD input.

The autoreverse tape deck of the TC-308 has a sendust-laminated core head whose 1.2-micrometer gap provides a flat response up to 18,000 Hz. There are both Dolby B and Dolby C noise-reduction circuits. A unique feature for a car deck is Playtrim, developed by NAD and Dolby Laboratories to compensate for the common frequency-response errors caused by incorrect recording bias or equalization, or by the small but inevitable differences in head-gap azimuth between different tape machines. These factors can produce substantial losses in high-frequency response that may not be correctible by conventional tone controls. And such response errors are magnified by the action of the Dolby noise-reduction circuits, whose operation is predicated on a flat frequency response through the recording and playback processes.

Playtrim is a specialized high-frequency tone control that operates in the playback circuits ahead of the Dolby decoding section. Its effect starts at 2,000 Hz and reaches a maximum boost or cut of about 5 dB at 15,000 Hz. Because Playtrim

works within the Dolby record-playback system, it does not affect the playback noise level and serves only to flatten out the playback frequency response. On the TC-308, the Playtrim circuitry is controlled by a front-panel knob, which is adjusted by ear for the most satisfactory high-frequency sound.

The Soundstream TC-308 has a quick-release chassis that slides into a housing whose standard DIN dimensions fit the mounting slots of most cars. The removable unit plugs into a special connector in the rear of the housing that carries the power, signal, and antenna circuits. An optional quick-release handle can be attached to the TC-308, making it easier to remove when you leave your car.

The TC-308 is finished entirely in black, including its controls. Most of the controls are soft-touch push-buttons with small amber lights at their centers that change to red when the button is pressed. Each of the six large preset buttons can be assigned to one FM and one AM frequency. Other buttons are used for manual tuning and to select AM or FM, local or distant scanning sensitivity, loudness compensation, Dolby B or Dolby C, 120- or 70-microsecond tape playback equalization, and the Music Sensor feature, which halts a tape in fast-forward or rewind at silent intervals between selections.

A small fluorescent display window shows the station frequency, band, stereo reception, scanning threshold sensitivity, and the Dolby system in use. To its left is the cassette slot. The cassette is loaded endwise, and when it is flush with the panel, a motor silently draws it in and play begins.

The remaining front-panel controls are two multifunction concentric knobs at the left. In its center position, the upper knob is the volume control, with a large number of detented steps. Pushing the knob in alternately turns the tuner section on and off, and when it is pulled out it becomes a left/right balance control. Concentric with this knob is a small lever that controls the front/rear fader. The lower knob is normally the Playtrim control. Pulled out it becomes the treble tone control, and pressing it in starts auto-

matic scanning of the FM band (a second press stops the scan). The lever concentric with this knob is the bass tone control.

Both tone controls are detented at their centers, as are the fader, balance, and Playtrim controls. During the initial installation, two screwdriver adjustments on top of the unit can be used to match a CD player's left- and right-channel levels to the tape and tuner outputs.

The suggested retail price of the Soundstream TC-308 is \$579. The optional SH30 quick-release handle is \$20. Soundstream Car Audio, Dept. SR, 2907 W. 182nd St., Redondo Beach, CA 90278.

### Lab Tests

By using the CD input, we were able to measure the audio performance of the Soundstream TC-308 without going through the FM tuner. Its tone controls had better characteristics than those of most home receivers we have seen, affecting the response below 200 Hz and above 4,000 Hz with negligible effect in the midrange. The loudness compensation boosted both low and high frequencies moderately at reduced volume settings. The CD input sensitivity (at maximum volume, for a 1-volt output) could be set between 62 and 900 millivolts. The audio outputs clipped at 1.5 volts (into a standard EIA load), and the A-weighted noise level was 82 dB below 1 volt.

The FM tuner's mono sensitivity was excellent, as was its noise level. The mono distortion was substantially higher than that of typical home receivers but not very different from that of other car radios we have tested. Because of the automatic blending of the channels at low signal levels, it was not practical to measure the low-level stereo performance of the tuner. At inputs greater than 45 dBf, the tuner's output was essentially stereo, with acceptably low noise and distortion levels. At 35 dBf and below, however, channel separation had vanished and the result was mono sound, although the stereo indication in the display remained on at much lower levels.

The tape frequency response, measured using IEC-standard test tapes and with the Playtrim control

## LABORATORY MEASUREMENTS

**FM mono usable sensitivity** (75-ohm input): 13 dBf (1.2  $\mu$ V)  
**Mono 50-dB quieting sensitivity** (75-ohm input): 12 dBf (1.1  $\mu$ V)  
**Tuner signal-to-noise ratio** at 65 dBf: 75 dB  
**Tuner distortion** at 65 dBf: 0.6%  
**FM frequency response** ( $-3$ -dB limits): 20 to 20,000 Hz  
**Stereo separation** (at 65 dBf) at 100, 1,000, and 10,000 Hz: 38, 44, and 28 dB  
**Capture ratio** at 65 dBf: 2.5 dB  
**AM rejection** at 65 dBf: 67 dB  
**Selectivity**: alternate-channel, 71 dB; adjacent-channel, 5.5 dB  
**Image rejection**: 66 dB  
**AM frequency response**: 77 to 2,500 Hz  $+1.5$ ,  $-6$  dB  
**Tape-playback frequency response** (standard IEC test tapes): 120- $\mu$ s

**EQ**, 31.5 to 18,000 Hz  $+6.5$ ,  $-0.5$  dB forward and  $+4$ ,  $-0.5$  dB in reverse; 70- $\mu$ s EQ, 31.5 to 18,000 Hz  $+7$ ,  $-1$  dB forward and  $+3.5$ ,  $-0.5$  dB in reverse  
**Tape signal-to-noise ratio** (A-weighting, referred to 250 nWb/m at 315 Hz, 120  $\mu$ s EQ): no noise reduction, 50 dB; Dolby B, 59.5 dB; Dolby C, 64.5 dB  
**Flutter**: 0.06% JIS-weighted rms;  $\pm 0.12\%$  CCIR-weighted peak  
**Tape speed accuracy**:  $+0.35\%$  at start, 0.0% at end of C-60  
**Fast rewind time** (C-60): 107 seconds  
**Tone-control range**:  $\pm 7.5$  dB at 100 Hz;  $\pm 9$  dB at 10,000 Hz  
**Output at clipping** (into EIA load): 1.5 volts

## FEATURES

- Digital-synthesis AM/FM tuner
- Auto-scan and manual tuning
- Presets for six AM and six FM stations
- Signal-controlled channel blend and high-frequency rolloff
- Soft muting
- Autoreverse cassette deck with motor-assisted loading
- Music Sensor for automatic playback from beginning of current or next selection
- Ignition-key-off tape ejection
- Playtrim control to compensate for azimuth, bias, and recording-equalization errors
- Dolby B and Dolby C noise reduction
- Switchable tape equalization
- CD/auxiliary input
- Fader and balance controls
- Power-antenna control voltage
- Gold-plated RCA-type jacks for front and rear line outputs and CD/auxiliary inputs

centered, was essentially the same for both equalization time constants. It varied only about  $\pm 1$  dB from 31.5 to 4,000 Hz and rose gently to  $+5$  dB at 10,000 Hz and  $+7$  dB at 18,000 Hz. The response was very similar in both directions, differing only 1 to 3 dB from 5,000 to 18,000 Hz.

We also measured the tape response at the limit settings of the Playtrim control. At the maximum setting, the response varied about  $\pm 4.5$  dB at the highest frequencies, with its effect becoming detectable above 2,000 Hz. At the minimum setting of the control, the standard tapes yielded a response of  $+2$ ,  $-1$  dB from 31.5 to 18,000 Hz.

The tape signal-to-noise ratio, though not quite as good as we have measured on some other decks, was certainly satisfactory for automotive use. Measured wow-and-flutter was very low, and tape speed was almost exact, with negligible variation from one end of a tape to the other. It was surprising, however, to find that the maximum line output

from a 250-nWb/m standard reference recording level was only 250 millivolts.

When we connected the TC-308's line outputs to our regular home system, it sounded excellent. Tape playback was especially listenable, and we were pleased to find that the response boost in the uppermost octave did not degrade the sound in any way (in a car, it would probably be a plus).

The effect of the Playtrim adjustment was audible but surprisingly subtle. Since the effectiveness of this feature depends entirely on the user's hearing (and the high-frequency content of the tape), its theoretical utility may be reduced somewhat in practice. Still, it was encouraging to find that even careless use of the Playtrim control could not really degrade the sound of any tape.

The TC-308 is the only car radio we have tested to have nonvolatile station memories. Removing all power from the unit for hours or days did not result in loss of memo-





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## CAR STEREO

ry (most car receivers lose their memories within seconds).

We do have some criticisms of the ergonomic qualities of the TC-308. On the test bench, it was very difficult to operate one of the concentric knob controls without disturbing the setting of one or more of the others. Moreover, accidentally activating one of the soft-touch tuning buttons or the EJECT/CD button was a frequent annoyance.

In using the radio with a home music system, we found that an antenna wire a few feet long produced a full complement of receivable stations, most of which activated the stereo indicator, but only one station, transmitting from within 5 miles, was receivable with any sign of stereo separation! Most stations were received with full quieting and good quality but showed no separation when the tuner outputs were viewed on an oscilloscope. This is not too surprising when you consider that the TC-308 needs at least 40 dBf input for even moderate channel separation, but requires only about 20 dBf or so for good, quiet mono reception. *J.H.*

### Road Tests

User-friendliness right out of the box is a quality I have always sought in car audio components. The industry's batting average in this area is better now than it was a few years ago, which is an encouraging trend. Still, the ease with which I got the Soundstream TC-308 functioning after unpacking it was notable.

The TC-308 is an elegant, beautifully laid-out head unit that is both quite simple to use and sophisticated enough to provide very high-quality sound from Dolby B and Dolby C tapes or an external CD player. AM radio—well, we know how *that* sounds, but this tuner is certainly acceptable in the AM department. Mono FM sounds excellent and is less noisy than from the average car radio.

On the other hand, the stereo FM performance is open to some criticism. The tuner's very effective high-blend circuit is a bit too quick to narrow the channel separation and lop off the high frequencies. The result is very stable and quiet reception, but also a complete loss of meaningful stereo at an early

stage of decrease in signal strength. On one long-distance drive I often take, south from New York City along the New Jersey Turnpike, FM signals decrease in strength by more or less regular degrees as the distance from the city transmitters becomes greater. I usually receive stereo as far as forty miles away on good

*The Soundstream TC-308's bass boost pulled genuine, gut-kneading lows out of recorded music while leaving the middle frequencies intact.*

days, listenable mono out to sixty-five miles under the right conditions. With the TC-308, I heard plenty of clear mono broadcasts from the city, but stereo appeared only when I had approached to within fifteen miles. This was my first encounter with a high-blend circuit so muscular that it eliminated stereo from all but the very strongest signals. On the positive side, multipath and other noise sources did not become audible anywhere but on the most difficult stretches of our urban test route.

The autoreverse tape player performed equally well in either direction in any part of a tape. Similarly, both Dolby systems worked exactly as intended. A former tram crossing near the Brooklyn Navy Yard is my favorite spot to subject tape transports to a challenging variety of jounces, jars, and vibrations. The Soundstream TC-308 is one of only two units I've tested that showed *no* reaction to this extreme jostling. It behaved magnificently.

My best cassettes sounded best when the Playtrim control was set fairly far to the left of the center detent, which gives me the impression that either our test sample of the TC-308 was misadjusted or that Soundstream's engineers think that more tapes need a boost in this region than need attenuation. With my most wretched tapes, Playtrim did an excellent job of restoring a sense of openness and a high-harmonic presence to the sound. Inevitably, there is a noise penalty for such corrections, but since you ad-

just the control by ear, it is possible to strike a happy balance. People who use Dolby C tapes will derive the most benefit from the Playtrim feature.

I used a high-quality portable cassette player with the CD/auxiliary input. Sonically, this is an excellent input, and the level-matching facility is a definite plus. Any line-level source will do, and I also had a chance to run my world-band radio through this input—the result wasn't hi-fi but was certainly better than through the radio's 1½-inch speaker!

The tone controls leave the mid-range nearly untouched, which is what one would hope for in a high-quality system. Controls affecting the midrange can be quite useful in installations that are not able to deliver flat response, but the trend today is toward well-equalized systems. The Soundstream tone controls are for trimming *real* bass and *real* treble, not mid-bass boom and upper-midrange response. The loudness control audibly affects some of the lower midrange, but not in an objectionable way, and its bass boost pulls genuine, gut-kneading lows out of recorded music while leaving the middle intact.

More and more car stereo manufacturers are offering head units in permanent housings with removable chassis. The firmness of the Soundstream's rear-panel connector, the unit's freedom from noise (especially if a short grounding cable is used), and its ease of removal show its careful engineering. Providing the option of hooking up a portable CD player seems a very sensible approach. Although I am glad to add CD's to my mobile listening sources, I won't be ditching my large collection of tapes any time soon.

The excellent illumination and superb visibility from any reasonable orientation make the easily memorized control panel of the TC-308 a very attractive addition to any dash. And since it is easily removable, you can keep it where it won't be spirited away by a thief. Despite my reservations about the FM high-blend circuit, I find this among the easiest head units to recommend I've ever seen. A delight. *C.G.*

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The Winner Of  
**THE RODRIGUES CAPTION CONTEST**



No, no . . . this is for buying a turntable—I only eat a bug after you buy a complete system.

**T**HIS year's Rodrigues cartoon caption contest, our second, brought another overwhelming response from readers all over North America and such faraway places as Australia, Brazil, and France. One entry came from Zimbabwe!

As we did last year, in our January issue we printed a drawing by our regular cartoonist Charles Rodrigues and invited readers to submit captions for it. The prize offered for the one that was funniest (in the opinion of the judges) is \$100 and the original drawing. The winner is Michael Binyon, of San Luis Obispo, California, whose entry is printed with the cartoon above.

The caption most frequently duplicated was: "Betcha can't do this with a CD player." We received nineteen variations on that idea the first day contest entries were delivered with the mail, and we got many hundreds thereafter.

Wow and flutter, weighted measurements, torque, kick starts, direct drive vs. belt drive, getting up to speed, rumble, and resonance were the subjects of a lot of the captions. A great many others dealt with salesmanship, ballet, aerobic exercise, and weight loss. There were quite a few jibes at famous turntable brands and models.

The person mentioned most often

was ballet dancer Mikhail Baryshnikov, but exercise expert Jane Fonda was a close second. Other celebrities frequently referred to included Fred Astaire, Chubby Checker, Peggy Fleming, Dorothy Hamill, Julian Hirsch, Arthur Murray, Mary Lou Retton, Richard Simmons, John Travolta, and Tina Turner.

Many entries referred to disco, rumba, and heavy-metal rock. The composition named most often was Tchaikovsky's *Swan Lake*. (His *1812 Overture* came in first last year.) Others mentioned often were *Bolero*, *Dance of the Hours*, *Like a Virgin*, *The Skaters Waltz*, and *Tip-toe Through the Tulips*.

The editors thank all the contestants for their entries. We also thank last year's winner, Thomas Briggie, of Akron, Ohio, who this year served as one of the judges.

If you think the judges chose poorly and should have given the prize to one of the runners up instead, that proves our contest has something in common with international piano competitions, the motion-picture Academy Awards, and the Annual Miss America Pageant.

Now, quite frankly, we're a bit weary of cartoon captions. But the contest has given us so much pleasure that we'll probably be ready for another one next year. We hope you will be too. *William Livingstone*

*Runners Up*

. . . And on my mother's dresser was this music box with a little ballerina . . .

RICHARD W. WILLIAMS  
 Wheaton, IL

. . . 31, 32, 33, 33 $\frac{1}{3}$ —one minute, see!

KEN STEWART  
 Walton, KY

The tonearm is included, but you have to provide the toneleg yourself.

LEIF VINGÅRD  
 Älvsjö, Sweden

What's antiskate? Okay, now first imagine my foot is the needle. Now gimme your hand. . .

RUSS MURRAY  
 Schiller Park, IL

. . . and so you need *both*, you see, because there are some things a CD player just can't do.

MARTIN J. SCHAEFER  
 El Cerrito, CA

This manufacturer feels that raw horsepower has taken a back seat to sound quality long enough!

JIM PASHKOT  
 Inkster, MI

Now notice with the quartz lock on, there's no variation in the pitch of my voice.

DENNIS M. FRANCIS  
 Ravenna, OH

How is it with 45's? Well, I'm 48 and just look at her go!

DANIEL BELASCO  
 ROBERT SCOLES  
 FPO Miami, FL

It's our Gramm-Rudman line. You see how everything balances?

MAX HEILBRUN  
 New York, NY

Okay, now watch what happens when the antiskating kicks in.

KEVIN A. FORDER  
 Washington, DC



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by Julian Hirsch



## Optimistic Specifications: Amplifiers

**T**HE exaggeration of equipment performance specifications by manufacturers is as old as hi-fi itself (and by no means limited to that field). Some of it is mere advertising hype intended to make a product seem more desirable than its competition, and when the competitors do the same thing, the result is chaos and a confused buying public. Sometimes, when manufacturers use different test standards and procedures, the public is faced with the problem of comparing products not rated by the same rules. This is something like comparing the color and surface smoothness of apples and strawberries when what you are really interested in is their taste.

A specification based on an accepted standard should identify it in some way, such as EIA (Electronic Industries Association) or IHF (Institute of High Fidelity) or DIN (Deutsche Industrie Normen) or, perhaps, in the case of an amplifier's power rating, FTC (Federal Trade Commission). Unfortunately, this

information is often omitted in the printed specs, leaving us to infer the applicable standard from the way the information is presented. This is often difficult for *me* to do, and I would not expect most consumers to come up with the correct answer. Sometimes specifications based on more than one standard may be used without identifying the sources, probably to provide the most impressive numbers. The result may not be intentionally deceptive, but it certainly does add to the confusion!

Personally, I take the degree of a manufacturer's adherence to accepted standards as an indication of his objectivity and dedication to quality. In truth, a unique measurement is sometimes more appropriate to a product's characteristics, but its conditions should be stated clearly. Specifications that do not in some way define the test conditions are worthless; I ignore them and suggest you do likewise.

Besides misleading specifications, a number of products are offered with scanty performance ratings and often with little solid information on their actual operation. A paucity of specs *can* be perfectly legitimate. Many signal-processing devices, for example, do essentially what is claimed for them, but their performance is not easily defined in simple numerical terms. In such cases, you have to make a decision on the basis of listening experience or from the reports of reviewers in whom you have confidence.

Given the advanced state of audio technology, how can you know whether a specification is realistic or, to be charitable, hopelessly opti-

mistic? Also, how important is any particular specification? Should a product be rejected out of hand if it does not live up to it, or can the discrepancy safely be ignored?

First of all, in considering amplifiers, let's get the matter of rated power out of the way. Except in gross terms, it is entirely trivial. By this I mean that while it may matter whether your amplifier delivers 100 watts or 30 watts, you need not be concerned if your 100-watt amplifier clips at 92 watts. As a matter of fact, most amplifier power ratings today are very conservative.

How about distortion? If a product is rated at 0.05 percent THD (total harmonic distortion), but our tests show that it reaches 0.1 percent or even 0.3 percent THD at 20,000 Hz and rated output, is that a sign of an optimistic rating or of a substandard amplifier? It could be either, or both, but in any case it is a matter of little importance. A possible cause of slightly over-spec distortion, or of a slightly under-spec power output, is the failure of the manufacturer to "precondition" the amplifier by running it at one-third of its rated power for 1 hour before making measurements. Such preconditioning, which is required by the FTC, makes the amplifier about as hot as it is ever likely to get, and the result can be lower power-supply voltages due to increased winding resistance in the transformer. If the rating is *not* very conservative, preconditioning can affect the power measurement and sometimes the distortion level at full power.

Occasionally we find an amplifier that cannot quite deliver its rated power at one of the frequency extremes, and as a result its distortion at full power may appear to be very high. A better way to look at the situation is to realize that the problem is the optimistic power rating and not high distortion. If we operate such an amplifier at 5 or 10 percent less power, not an audible difference, we usually find that the distortion is as low as rated.

Normally, amplifier distortion is of no audible importance as long as it does not exceed about 1 percent at usable listening levels—provided that the distortion is caused by a simple nonlinearity in the amplifier and not a sudden discontinuity,

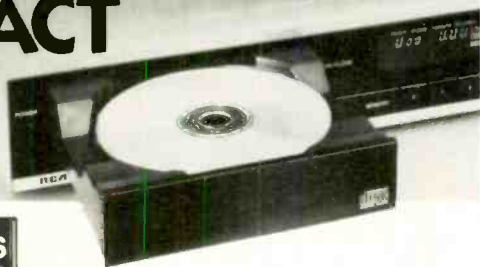
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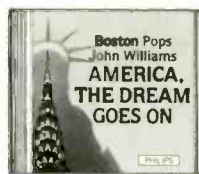
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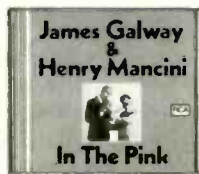
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Stars And Stripes Forever • The Philip Jones Ensemble plays 15 Sousa greats. London DIGITAL 115051

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The Cars: Greatest Hits Tonight She Comes, Drive, You Might Think, Shake It Up, others. Elektra 153702

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# DALI

CIRCLE NO. 54 ON READER SERVICE CARD

## TECHNICAL TALK

such as a "crossover notch." Some manufacturers, however, cannot resist trying to convey the image of near-perfection suggested by a distortion rating lower than the 0.01 percent that is readily attainable these days. Occasionally a new amplifier is even claimed to have audible virtues resulting from a new circuit topology that reduces distortion to hitherto unattainable levels. This is poppycock, pure and simple. Such an amplifier may indeed be a good one, but not because of lower distortion—and sometimes in spite of it, according to those who abjure the use of overall negative feedback to reduce amplifier distortion. I take as dim a view of that design philosophy as I do of its opposite, but there are good and bad examples of products from both schools.

Signal-to-noise ratio is a popular subject in this digital age, and some of the advertised numbers are unquestionably created to help bridge the gap between analog and digital noise levels in the consumer's mind (if not his ears). I use the word "created" advisedly, since one can truthfully claim *any* level of noise for an amplifier by using a sufficiently high "0-dB" reference level. Such a claim may be literally truthful but not entirely honest.

For years amplifier noise was

*Test conditions should be stated clearly. Specifications that do not in some way define the conditions are worthless. I ignore them and suggest that you do likewise.*

specified relative to full-power output. Referred to 100 watts, for example, 1 microwatt of noise represents an impressive -80-dB level. By the same procedure, a 10-watt amplifier having the same noise content would be rated at -70 db, making it seem that the 100-watt amplifier was quieter. In fact, they would produce the same amount of audible acoustic noise from the speakers. The problem is dealt with in the current EIA measurement standard by requiring that noise (and sensitivity as well) be referred

to a 1-watt level regardless of the amplifier's maximum power rating. By this procedure both amplifiers in our example would carry a -60-dB noise rating, making it clear that both would have the same noise performance in a given system.

How much audible noise (if you can't hear it, don't worry about it!) should you reasonably expect from your amplifier? That depends on a

*Normally, amplifier distortion is of no audible importance as long as it does not exceed about 1 percent at usable listening levels and is caused by a simple nonlinearity.*

number of factors, including the size and acoustic treatment of your listening room, its ambient noise level, the type of program material you prefer, and your typical listening volume. A noise level of -70 dB (referred to 1 watt) should be inaudible under most practical conditions. In many cases, a -60-dB level would suffice, and more than -80 db probably represents overkill—unless you have a 100-watt amplifier and sit a couple of feet from the speakers with the volume set near maximum.

As with so many other audio specs, the importance of differences in noise can easily be exaggerated. Small differences (a few decibels) will not be heard, but when they exceed 10 dB or so, you may be dealing with a real distinction between products. When a manufacturer points to the -100-dB noise level of his amplifier (even if it is legitimately rated by the EIA standard relative to 1 watt), you may be impressed, but don't assume that it will be quieter in your system than the more mundane but reasonably good unit you may now have.

Amplifiers are not the only audio components that occasionally suffer from optimistic specifications. Tuners, speakers, and turntables can also be victims of false representations. Next month I'll examine the kind of misleading specifications consumers may encounter with these products. □



# Thunderstruck

*It's like riding a roller coaster. You never know what to expect next. About the only thing you can be sure of is that you'll have great sound from this magical new deck. It's yours for just \$149<sup>90</sup>, with no catch.*

By Drew Kaplan

It's no secret. You can see that it's a double deck for dubbing. You can also see that it features auto reverse for non-stop entertainment.

And, you can even see that it has high speed dubbing for expanding your tape collection or making tapes for your car or personal stereo.

But, what you can't easily see is what you're going to get when you add up all these sophisticated innovations and then throw in some surprising extras.

## STRANGE EGG

And speaking of strange extras, what would you think of being able to listen to two tapes at the same time. It's great for mixing vocals, but it's a feature that I've never seen before.

But, let's look at some everyday useful features that make this deck totally unique and superbly useful. Of course, it has a frequency response to 17,000hz, so whatever you do will really sound great.

First, let's just listen to a tape. Just put the tape in deck '1' and activate the 'soft touch' play button. Well, that's really too simple. Let's listen to song 3 on side two of the tape.

This deck features forward and reverse APSS. Just touch forward APSS and the deck will locate the beginning of the next song on the tape and start playing.

If you'd like to skip the rest of the song or continue skipping songs, just press forward APSS. If you're listening to a song you'd like to hear again, just touch reverse APSS. The deck will locate the beginning of your song.

Since APSS locates the beginning of each song on your tape, this feature will make it really easy to choose the exact order in which you want to copy songs. APSS even allows you to have the deck pause at your song.

If you noticed above that I said song 3 on side 2 of the tape, it must be clear that this is an auto reverse deck and that APSS will search both sides of the tape.

When you're playing a tape, the deck will reverse automatically at the end of a cassette, or at any time you touch the 'Tape Direction Button'.

## JUST THE BEGINNING

Just imagine listening to both sides of a cassette and then having a second cassette start to play both sides on and

on, forever. Well, this deck features sequential play between its two decks.

So, you can listen to 3 hours of un-repeated music from 2 standard 90 minute cassettes. Then, the second deck will keep repeating, forever.

Both decks give the option of conventional one-way play or continuous play. Now you can have uninterrupted music while you work or while you relax. And, isn't that what enjoying your music is all about?



## AND OH, DOES IT RECORD

Imagine putting a recorded tape in deck '1' and copying BOTH SIDES automatically. Well, with Sharp's new deck, that's exactly what you'll do.

You can copy both sides of a pre-recorded tape onto a single side of a 90 minute cassette automatically. (Both decks can reverse totally independently.)

You can duplicate at normal or high speed. So, you can make copies in half the time of both sides of your cassettes.

This deck has electronic high speed dubbing. Each of its decks has 2 capstans for rock stable tape transport. About the only thing this deck doesn't have is Dolby C. But with its 66db signal to noise ratio with Dolby B, it sounds great.

Note: When you copy tapes, you turn off Dolby. If the tape is already encoded with Dolby B or C, the copy will be identically encoded as well.

Add Sound On Sound. If you sing, this is the deck for you. Here's what you do. You can play a music tape on deck '1', plug in a mike and sing along while you record everything on deck '2'.

Or, if you're really into professional applications, look at this. Plug in a mike and record your own voice on deck '2'.

Then play the tape back on deck '1' and

copy the tape onto deck '2'. While the tape is being copied, you can add yourself singing harmony. In this way, you can be a duet, a trio or even a chorus.

## ROUND AND ROUND IT GOES

It goes forward. It goes backward. And, it goes round and round. Just wait till you see this recorder in action.

You'll sit mesmerized as one tape stops and the other starts. Then it reverses and goes back and forth and back and forth. Are you getting sleepy?

Except for the occasional click as this machine changes decks or reverses direction, nothing will disturb your music for as long as you want with this incredible new deck.

Each deck has its own equalization switches to match tape type. Each deck has full play, pause, and reverse controls. The deck '2' is the deck that records.

The deck is 17" wide, 4 3/4" tall and 9 3/4" deep. It's backed by Sharp's standard limited one year warranty.

## BE THUNDERSTRUCK RISK FREE

Wait till you hear the clean pure music that this deck will produce. Wait till you get your hands on its solid controls. Wait till you enjoy uninterrupted hours of your favorite music from two different cassettes. And finally, wait till you copy both sides of cassettes automatically.

If you're not 100% satisfied, simply return this deck in its original box within 30 days for a courteous refund.

To order your Sharp Dual Cassette Deck with High Speed Dubbing, Sequential Automatic Play, Dual Auto Reverse, and much more, call toll free, or send your check for DAK's breakthrough, no catch, price of just \$149<sup>90</sup> plus \$6 for postage and handling. Order No. 4521. CA res add tax.

Sure it's fancy. Sure it does just about everything but fly. But, what you'll really love is the sound quality and the musical freedom you will enjoy from now on.



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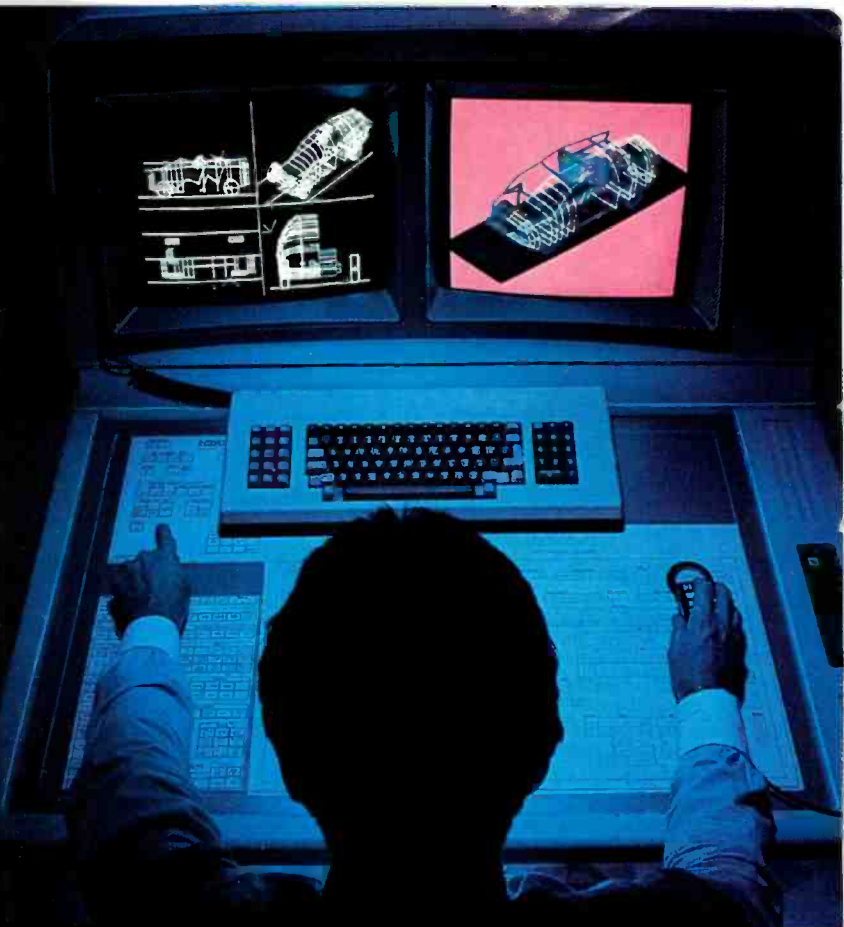
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# DESIGNING GM BYTE BY BYTE.

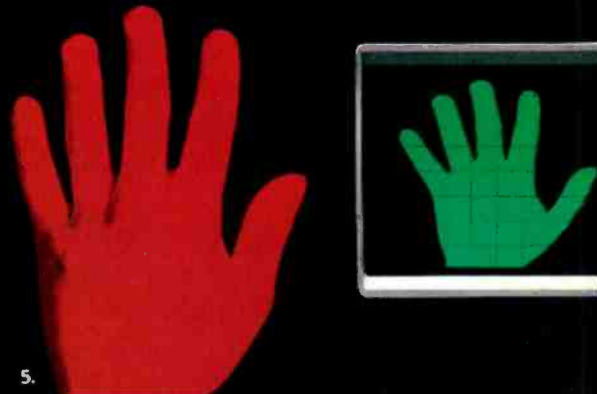
Designing General Motors to become the first 21st century corporation means going back to the drawing board and looking at ourselves in the light of a new age: the Computer Age.

It means thinking in a new mode, accessing the future in a daring, creative new way. Our goal? A sleeker, more streamlined, computer-driven GM—an organization powered by technology, fueled by brainpower, and outclassing all competition. Our inventive use of computer technology in design, engineering, manufacturing, and safety is producing a GM programmed for quicker response to our customers, better efficiency and outstanding performance. A GM designed to bring you into the future. Byte by byte.

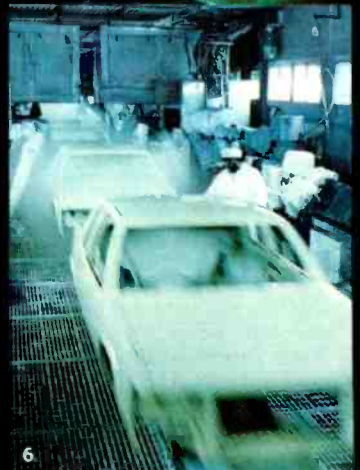


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3. INFORMATION PROCESSING CENTER. Electronic Data Systems control center helping to streamline data processing and telecommunications functions, enabling General Motors to become more responsive to its customers' needs.
4. INSTRUMENT PANEL. Touch-sensitive cathode-ray tube with multiple functions that include diagnosing service problems in seconds.
5. MULTIMATCH. Machine vision system used in various quality-control procedures that increase manufacturing quality and productivity.
6. NUMERICALLY CONTROLLED ROBOT PAINTERS. These robotic spray painters provide consistent, high-quality paint finishes on GM automobiles.





PHOTOS BY ROBERT LORENZ

## ONKYO INTEGRA TA-2056 CASSETTE DECK

*Craig Stark, Hirsch-Houck Laboratories*

**T**HE Onkyo Integra TA-2056 is a three-head cassette deck with Dolby B and Dolby C noise-reduction systems, a digital tape counter, a user-adjustable bias-trim control, and a variety of programming options. It seems to be designed for the large group of music listeners who seek adequate performance and abundant features at a moderate price.

The TA-2056 uses one d.c. servomotor for its single-capstan drive, a second motor to turn the reel hubs, and a third to operate the head and pinch-roller mechanism. The head assembly moves in a two-step sequence. Its intermediate position permits close but not full contact between the heads and the tape, which allows high-speed scanning to detect blank spaces between selections (as needed by the preview and repeat features) without subjecting the heads to excessive wear.

The record and playback heads in the TA-2056 are made of hardened permalloy. While heads of this material are not as resistant to wear as sendust and ferrite heads in cassette applications, they should last the life of the deck under normal conditions. The record and playback elements are separate but housed in a

single casing, allowing a user to make an instant comparison between the sound source and the recorded result. Moreover, the gap width of each head can be optimized for its specific function.

The TA-2056 has a relatively conventional cassette well, but its backlighting and large front window make it easier than most other designs do to read the label and see how much tape is left. Sensors within the well detect the cassette type (ferric, chrome, or metal) and automatically switch the deck to the correct bias and equalization settings. The cassette-well door is removable, allowing access to the heads and pinch-roller for routine cleaning and demagnetizing.

The digital tape counter on the TA-2056 can be switched to show either the elapsed time or the remaining time while playing or recording. It does this by using a microcomputer chip to calculate the differential speed between the two reel tables. The user must initially set the calculator by pressing a button that corresponds to the length of the tape (and, for a C-46 cassette, whether it has a large or regular-size hub). The peak-hold record-level indicator has a twelve-segment LED

string for each channel, calibrated from -20 to +8 dB.

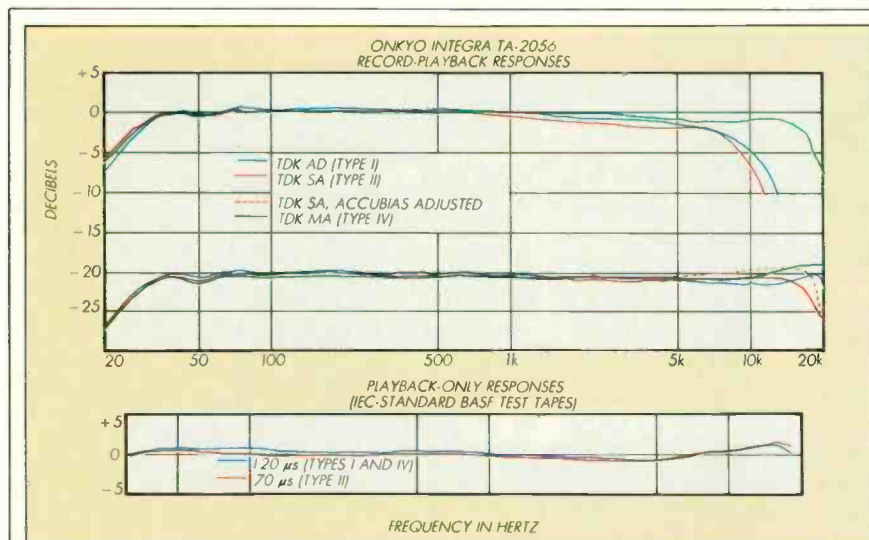
Either individual selections or an entire side can be set to repeat up to five times. Furthermore, a block of consecutive selections of any length can be defined and similarly repeated. During recording, the AUTOSPACE button can create 5-second blanks for detection by the programming circuits. An additional scanning button provides bidirectional search and a 10-second preview of each selection.

The TA-2056 has a user-adjustable ACCUBIAS control to optimize performance from different brands of ferric and CrO<sub>2</sub>-type cassettes. No built-in test generator is provided, however, so the user must rely on his ear while switching between source and tape positions or use the settings for a variety of tapes that are specified in the owner's manual.

Separate left- and right-channel record-balance controls are provided, together with a master record-level control. There is no volume control for headphones or overall output. On the other hand, microphone jacks are supplied, along with a defeatable FM-multiplex filter and a switch for connecting the unit to an external timer.

The Onkyo TA-2056 measures 17 $\frac{1}{8}$  inches wide, 4 $\frac{3}{8}$  inches high, and 14 $\frac{1}{2}$  inches deep, and it weighs just over 14 pounds. It is available in either black or silver finish. A cable-connected remote control is optional. Price: \$395; \$50 for re-





## LABORATORY MEASUREMENTS

**Fast-forward time (C-60):** 64 seconds

**Rewind time (C-60):** 64 seconds

**Dolby tracking error:** Dolby B, +0.5, -1 dB; Dolby C, +1.0, -1.5 dB

**Wow-and-flutter:** 0.036% wrms, 0.058% DIN peak-weighted

**Line input for indicated 0 dB:** 40 mV

**Line output at indicated 0 dB:** 0.52 volt

**Microphone input for indicated 0 dB:** 0.36 mV

**Microphone overload:** 150 mV

**Meter indication at IEC-standard 0 dB:** ±0 dB

**Tape: TDK AD (Type I, ferric)**

**IEC 0-dB distortion:** 0.62%

**Meter indication at 3% third-harmonic distortion:** +4 dB (+5.0 on external meter)

**Signal-to-noise ratios (in decibels):**

	Unwtd.	A-wtd.	CCIR
NR off	52.7	58.6	57.9
Dolby B	58.4	67.7	67.6
Dolby C	59.6	71.4	75.7

**Tape: TDK SA (Type II, chrome-equivalent)**

**IEC 0-dB distortion:** 0.75%

**Meter indication at 3% third-harmonic distortion:** +4 dB (+5.4 dB on external meter)

**Signal-to-noise ratios (in decibels):**

	Unwtd.	A-wtd.	CCIR
NR off	56.0	61.8	60.0
Dolby B	59.5	70.2	69.8
Dolby C	60.6	74.8	77.2

**Tape: TDK MA-R (Type IV, metal)**

**IEC 0-dB distortion:** 1.3%

**Meter indication at 3% third-harmonic distortion:** +4 dB (+3.2 on external meter)

**Signal-to-noise ratios (in decibels):**

	Unwtd.	A-wtd.	CCIR
NR off	53.2	59.0	57.0
Dolby B	57.2	67.6	67.0
Dolby C	58.6	74.8	72.2

mote control. Onkyo U.S.A. Corporation, Dept. SR, 200 Williams Dr., Ramsey, N.J. 07446.

### Lab Tests

The advantage of using a separate playback head with a narrow gap was evident in our playback-only frequency-response measurements. Measured with the IEC standard ferric and CrO<sub>2</sub> BASF test tapes, the response of the TA-2056 varied by less than ±1.5 dB from 31.5 to 18,000 Hz.

To check the record-playback pa-

rameters we used certified "center-line performance" samples of TDK AD (ferric), SA (CrO<sub>2</sub>-type), and MA (metal) cassettes. At the IEC 0-dB reference level (250 nanowebers per meter)—which correlated closely with 0 dB on the deck's record-level indicators—the overall response of the metal tape extended nearly a full octave above that of the other tape types. At the -20-dB level customarily used for record-playback frequency-response measurements, the response did not fall more than -3 dB until below 30

Hz, and it extended beyond our 20,000-Hz measurement limit with the metal and ferric formulations. Leaving the ACCUBIAS knob at its detented center position resulted in a -3-dB point of 17,000 Hz for the high-bias (chrome-type) tape sample. While this measurement met specification, we were able to improve it (as shown on the accompanying graph) with a slight adjustment of the bias control.

Signal-to-noise measurements for the TA-2056 were good, though our metal tape sample did not outperform the ferric and chrome-equivalent tapes as it usually does in this respect. This could be the result of either a slight underbias for metal tapes or limited maximum head current in the deck.

Our wow-and-flutter measurements were somewhat better than specified, representing rather typical performance for a single-capstan drive in this price class. Dolby B and Dolby C accuracy was very good, and the microphone and line-level sensitivity, output level, and overload level were all normal.

### Comments

From a human-engineering standpoint, the TA-2056's controls are well placed and the displays easy to read. Tape handling was good, and mechanical noise was very low. While not rivaling a clock in accuracy, the digital tape counter was extremely helpful in determining which selections could be grouped together on a side. The deck's programming facilities worked well and could prove quite valuable to many users. The accuracy of the record-level indicator, and its peak-hold feature, made it genuinely useful for setting the proper recording level. The owner's manual is unusually well written and informative.

The overall sound quality of the TA-2056 was very good. Source-vs.-tape comparisons showed slight but perceptible differences, though these were well within the limits of what one should be willing to accept from a deck in this price class. Onkyo has a long-standing reputation for building components that rank high within their respective product and price categories, and the Integra TA-2056 cassette deck upholds that tradition.

## IN THE PURSUIT OF PERFECTION, TECHNICS MOVES TWO STEPS CLOSER.

A high-performance digital filter. A fine-focus single-beam laser. Both in the new Technics compact disc players.

Musical perfection. It's the promise of the compact disc. To fulfill that promise the new Technics SL-P300 incorporates two significant advances.

A high-performance digital filter to deliver unsurpassed sound. An improved FF1 fine-focus single-beam laser system. It has the strength and accuracy to "read" through most fingerprints, scratches and even imperfections in the disc itself.

For programming convenience, the FF1 laser can move across a disc in less than a second. And, of course, the SL-P300 also has an infrared, wireless remote control. To play any selection. In any order. From almost anywhere in the room.

Result: the new Technics compact disc players have moved two steps closer to musical perfection. And now, so have you.

**Technics**  
The science of sound.



CIRCLE NO. 1 ON READER SERVICE CARD





## LUXMAN R-406 AM/FM RECEIVER

*Julian Hirsch, Hirsch-Houck Laboratories*

**L**UXMAN'S R-406 AM/FM stereo receiver combines a phase-locked-loop (PLL) digital-synthesis tuner with an amplifier rated to deliver 60 watts per channel into 8-ohm loads from 20 to 20,000 Hz with no more than 0.05 percent total harmonic distortion. Unlike many other stereo receivers, it also carries dynamic power ratings of 85, 120, and 132 watts into loads of 8, 4, and 2 ohms, respectively.

The R-406 measures 17¾ inches wide, 13½ inches deep, and 4½ inches high, and it weighs about 17 pounds. Its uncluttered front panel, in pale satin-finish gold, has a single large volume-control knob to the right of a display window that looks somewhat like the radio dials that almost all tuners and receivers had before digital tuning became widespread. The display window contains a digital frequency readout and red LED indicators showing the number of a selected preset channel, relative signal strength, and the selected program source.

A row of pushbuttons below the display, finished to match the panel, selects the program source: AM, FM, CD/auxiliary, phono, video

sound, Tape 1, and Tape 2. Tapes can be dubbed from Tape 2 to Tape 1 while monitoring from Tape 1. The receiver can be connected to audio programs from any of three different video sources (such as a TV set, a VCR, or a videodisc player) by means of a VIDEO SOUND SELECTOR button. Other small front-panel buttons switch the power, connect either or both of two sets of speaker outputs to the amplifier, and activate the SUBSONIC FILTER and LOUDNESS COMPENSATOR. Small knobs operate the bass and treble tone controls and the balance adjustment.

Above the R-406's display window are eight station-preset buttons; each button can be assigned to both an AM station and an FM station. The tuning controls are a pair of larger red buttons. Other buttons switch off the FM muting, which also places the tuner in its mono mode, and activate the AUTO SEEK tuning feature.

The rear apron of the R-406 contains three DIN sockets through which the receiver can be connected to a Luxman cassette deck, turntable, and CD player. All these components can then be controlled by

the RC-406 wireless remote control that comes with the R-406. The remote unit switches the power and controls the volume of the receiver as well as selecting the input source, the tuning mode for AM or FM, the play and pause/stop modes of the CD player, the start/cut and cue functions of the record player, and the play, record, fast-forward, reverse, and pause functions of the cassette deck. In addition, the receiver has a jack in the rear for connecting the optional RC-101 Remote Sensor, whose long extension cable allows these control functions to be performed from another room.

The R-406 receiver has a removable, hinged AM loop antenna, inputs for 75- and 300-ohm FM antennas, and an AM wire antenna. The speaker terminals are insulated and accept the stripped ends of the speaker wires. There are three switched a.c. convenience outlets. Price: \$600. Luxman (Division of Alpine), Dept. SR, 19145 Gramercy Pl., Torrance, CA 90501.

### Lab Tests

During the 1-hour preconditioning period at 20 watts (one-third rated power), the top of the receiver became only moderately warm. Its output transistors are cooled by a liquid-filled heat exchanger, which operated very effectively. Our full-power testing heated up the top of the cabinet noticeably, but it never became uncomfortable to touch.

# Answering Attack Phone

*Let's vanquish the problem of bulky complicated answering machines. And let's conquer the problem of lost beepers. Now when you're out, just the sound of your voice is all you need to retrieve your messages.*

Stamp out beepers. Here's a microprocessor controlled answering machine that's so smart it will give you your messages without using a beeper.

But, before we explore just how easy it is to use and all of its sophisticated features, such as, toll saver, 2-way record, and remote saving or erasing of messages, let's take a look at the phone.

Like the answering machine, the phone has attacked wasted motion, complicated commands and uncomfortable fit with the latest in technology.

Here's a phone that will dial any of your 10 most frequently called numbers with the touch of a single button. Just touch another electronic button and the phone will operate in Tone or Pulse.

Another button gives you instant redial. And, as for comfort, well just wait till you cradle the great sounding Phone Company style handset on your shoulder.

This phone which can be desk or wall mounted, is no larger than a conventional feature phone. It's just 9" deep and 8½" wide. And, a standard instantly changeable audio cassette (included) is concealed just to the right of the handset.



## VANQUISH THE REST

Easy to use. Forget cumbersome 'fixed time' outgoing announcements. Most machines make you fill a 20 second continuous loop cassette.

If you've ever tried to do this, you know just what a pain it is to make your message just the right length. With the Attack Answerer, just push 'Record Announcement' and talk into the built-in microphone from 2 seconds to 50 seconds.

After you've recorded your announcement, the machine will automatically play it back for your approval.

When you get your first call, it will be answered on the 4th ring. (Read on to see why.) If you're at home, you'll hear the message being left by the caller over the built-in speaker if you desire.

If you wish to talk to the person, just pick up the receiver and start talking. If you don't, you've just experienced the privacy protection called 'call screening', which lets you hear who's calling before you decide to answer.

This machine will let your caller leave any length message up to one minute long. If they hang up in 20 seconds, that's how long the message will be.

If they don't choose to leave a message, the machine will ignore the call. So, when you play back your messages, all you'll hear are messages, no dead space. And of course, you won't have to listen to your own announcement between each message you receive.



## TOLL SAVER, OR THE 4TH RING

If you're across town or out of town, why invest a dime or pay for a toll call if you have no messages?

Each time you reset your machine, it will answer the first call on the 4th ring. After it's taken its first message, it automatically starts answering on the second ring. So, when you call in, just hang up if you get to the third ring. You'll automatically know that you have no messages.

If you do have messages, just give the machine a special signal with your own voice, and you'll receive your messages. Then you can have the machine save or erase the messages that you have heard.

## MISSILE GUIDANCE

This machine is so smart that it electronically marks each message's location. It knows precisely where your outgoing announcement as well as each message that has been left is located.

The action is fascinating to watch. First, it plays your outgoing announcement. Then, it sounds a tone as it zips to the end of the last message it took.

It then beeps and starts taking the new message. Finally, it rewinds back to the precise start of your outgoing announcement, prepared to start again.



## MORE SMARTS

If you want to record both sides of a call, just touch the 2-way record button

and you'll have a record of the call.

Everything is automated. Just touch one of the full logic controlled buttons and this computer answers with a confirming beep and jumps into action.

To play back messages at home, just touch the 'Message Report' Button. A flashing message light even tells you at a glance if you've received any messages while you were out.

## EASY INSTALLATION

Just plug in the modular phone jack and the included AC adaptor. Then, just record your announcement.

The Answerer Attack Phone is ready to take messages or act as your super automated office or home telephone. It's made by Unitech and backed by their standard limited warranty.

## THE ANSWERER ATTACK PHONE RISK FREE

It's new. And, it will set you free. From its Phone Company feel handset to its electronic convenience extras to its state of the art answerer, you'll have incredible convenience and simply great sound.

If you're not 100% thrilled, simply return it to DAK within 30 days in its original box for a courteous refund.

To order your Unitech Answerer Attack Phone with totally automated telephone features and easy to use answering machine risk free with your credit card, call toll free or send your check for DAK's breakthrough price of just \$99 plus \$7 P&H. Order No. 4359. CA res add tax.

Wait till you hear the phone. Wait till you use the 1 touch dialing. And, wait till you hear the sound quality and enjoy the convenience of this answering machine.



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## FEATURES

- Digital-synthesis AM/FM tuner with AUTO SEEK or single-step tuning
- Pushbutton selection of program source
- Inputs for CD/auxiliary, phono, video source (TV, VCR, videodisc), Tape 1, Tape 2
- Eight station presets, each assignable to one FM and one AM frequency
- FM muting/mono switch
- Loudness compensation
- SUBSONIC filter
- Bass and treble tone controls
- Connections and switching for two pairs of speakers
- Rear-apron audio input and output jacks, video input jacks, DIN connectors for control interface with compatible Luxman components
- Detachable, pivoted AM loop antenna
- Wireless remote control with optional extender
- Three switched a.c. convenience outlets

## LABORATORY MEASUREMENTS

- FM Tuner Section**
- Usable sensitivity (mono):** 17.4 dBf (4.1  $\mu$ V)
- 50-dB quieting sensitivity:** mono, 17.5 dBf (4.1  $\mu$ V); stereo, 16 dBf (3.5  $\mu$ V)
- Signal-to-noise ratio at 65 dBf:** mono, 82 dB; stereo, 72 dB (77 dB at 85 dBf)
- Harmonic distortion (THD + noise) at 65 dBf:** mono, 0.15%; stereo, 0.14%
- Capture ratio at 65 dBf:** 1.3 dB
- AM rejection at 65 dBf:** 66 dB
- Selectivity:** alternate-channel, 67 dB; adjacent-channel, 5.5 dB
- Stereo threshold:** 16 dBf (3.5  $\mu$ V)
- 19-kHz leakage:** 70 dB
- Hum:** -77 dB
- Stereo channel separation at 100, 1,000, and 10,000 Hz:** 39 dB, 42.5 dB, 43 dB
- Frequency response:** 30 to 15,000 Hz +1.5, -0 dB
- AM Tuner Section**
- Frequency response:** -6 dB at 33 and 2,400 Hz
- Audio Amplifier**
- 1,000-Hz output power at clipping:** 78 watts into 8 ohms; 105 watts into 4 ohms; 100 watts into 2 ohms
- Clipping headroom** relative to rated output: 1.14 dB (8 ohms)
- Dynamic power output:** 156 watts into 8 ohms; 230 watts into 4 ohms; 132 watts into 2 ohms
- Dynamic headroom:** 4.15 dB (8 ohms)
- Harmonic distortion (THD + noise) at 1,000 Hz into 8 ohms:** 1 watt, 0.019%; 10 watts, 0.0076%; 60 watts, 0.0175%
- Maximum distortion** from 20 to 20,000 Hz into 8 ohms: 0.072% at 60 watts (20,000 Hz)
- Slew factor:** greater than 25
- Sensitivity (1-watt output into 8 ohms):** phono, 0.24 mV; CD/aux, 20.5 mV
- Phono-input overload:** 141 to 166 mV
- A-weighted noise (referred to a 1-watt output):** phono, -77 dB; CD/aux, -78.5 dB
- Phono-input impedance:** 50,000 ohms in parallel with 10 pF
- RIAA phono-equalization error:**  $\pm 1$  dB from 20 to 20,000 Hz
- Tone-control range:** +7.5, -9 dB at 100 Hz; +10.5, -8.5 dB at 10,000 Hz

The audio amplifiers of the Luxman R-406 lived up to their impressive ratings. The 1,000-Hz output power at clipping was 78 watts per channel into 8 ohms, increasing to 105 watts into 4 ohms and 100 watts into 2 ohms. The clipping headroom (8 ohms) was 1.14 dB. With the 20-millisecond tone bursts of the dynamic power measurement, the amplifier clipped at 156 watts into 8 ohms (for a dynamic headroom of 4.15 dB), 230 watts into 4 ohms, and 132 watts into 2 ohms. The distortion was nearly constant with frequency except for a rising

characteristic above 5,000 Hz. It typically measured between 0.01 and 0.02 percent at most audio frequencies and power outputs below the clipping point.

The amplifier of the R-406 has a rather high gain, requiring only 20.5 millivolts into the high-level inputs or 0.24 millivolt into the phono input for a 1-watt output. The respective A-weighted noise levels through these inputs were -78.5 and -77 dB, referred to 1 watt. Noise was the only measured characteristic in which the receiver fell appreciably short of its specifica-

tions, an optimistic 98 dB and 86 dB, respectively, for the high-level and phono inputs. Luxman's figures may have been referred to full rated power, however, instead of the 1-watt output called for by the EIA/IHF standard, although the ratings do mention IHF measurements.

The phono preamplifier overloaded at inputs in the 140- to 166-millivolt range, depending on frequency. Its input impedance was 50,000 ohms in parallel with a very small capacitance (less than 10 picofarads). The amplifier's slew factor was greater than 25.

The tone-control characteristics were good. The bass turnover frequency shifted between about 100 and 300 Hz as the knob was turned, and the treble response hinged at about 1,500 Hz. Oddly, when the treble control was set in the middle of its cut range, the only effect was an overall gain reduction of about 1 dB over its full frequency range. Otherwise the controls worked as expected. The loudness contours boosted both low and high frequencies moderately when the volume control was set at least 20 dB below its maximum. The SUBSONIC filter rolled off the low-frequency response by 6 dB per octave beginning at 100 Hz. The RIAA phono equalization was accurate within  $\pm 1$  dB from 20 to 20,000 Hz.

In most respects the FM tuner section of the R-406 met its specifications, which were quite good. Its frequency synthesizer had a tuning error of 25 kHz, which degraded its usable-sensitivity measurement and to some extent the distortion measurements. The mono-usable sensitivity initially measured 17.4 dBf (4.1 microvolts, or  $\mu$ V), but when we retuned the generator for minimum distortion it improved to 13.5 dBf (2.6  $\mu$ V). Although this measurement did not match the specified value of 10.3 dBf (1.8  $\mu$ V), the difference is not significant since the more important 50-dB quieting sensitivity measured essentially as rated.

The FM noise level was an exceptionally low -82 dB in mono and -72 dB in stereo, and the latter figure improved to -77 dB at 85 dBf (10,000  $\mu$ V). The distortion was a low 0.14 to 0.15 percent in both mono and stereo, as rated.

The FM stereo channel separation was 40 to 45 dB from 130 to 15,000 Hz, falling to 23 dB at 30 Hz. The capture ratio of 1.3 dB slightly surpassed the tuner's specified 1.4 dB, and its AM rejection of 66 dB was considerably better than the rated 56 dB. Selectivity was also good, averaging 67 dB (the rating is 60 dB). The frequency response of the AM tuner section was down 6 dB (from the 1,000-Hz level) at 33 and 2,400 Hz.

## Comments

Our measurements show the Luxman R-406 to be a very competent receiver whose overall performance can be characterized as good to excellent. We were impressed by its exceptional dynamic power reserve, especially when driving low-impedance loads. Its 8-ohm dynamic headroom of 4.15 dB is certainly rare and possibly unique among receivers. The tuning error we found in its FM section is a common flaw in frequency-synthesis tuners and receivers, reflecting the frequency tolerance of the quartz-crystal oscillator that controls the synthesizer. In our view, the excellent signal-to-noise ratio of the tuner section more than compensates for this small weakness, since it provides quieter reception under "real world" conditions.

The Luxman R-406 is an attractive, easy-to-use receiver that is happily free of the design and styling excesses that have afflicted some other receivers. Moreover, we found nothing in its operation that left an unfavorable impression. It sounded first-rate with FM broadcasts, LP's, and Compact Discs.

As our measurements show, the 60-watt rating of this receiver is very conservative. It had more than enough power to support high listening levels with speakers having fairly low efficiency, and it drove higher-efficiency speakers to window-rattling levels without signs of distress. And the amplifier section's protection system (we assume it has one!) never shut it down during our testing, even when it was driving 2-ohm loads at clipping levels. The Luxman R-406 is one receiver that does not have to be handled with kid gloves.

**Circle 140 on reader service card**



## ADVENT LEGACY SPEAKER SYSTEM

*Julian Hirsch, Hirsch-Houck Laboratories*

**T**HE Large Advent speaker system introduced in 1968 was intended to "compete with the most elaborate and expensive speaker systems at a fraction of their price," and in its time it was widely acclaimed in the hi-fi world. There have been many improvements in loudspeaker design and performance since 1968, of course, and the Advent company (now a division of International Jensen, Inc.) is offering the Legacy as today's "digital ready" successor to the illustrious Large Advent.

The "digital ready" aspect of the Advent Legacy refers to its ability to handle very high peak-power levels. According to the manufacturer, it will easily handle 100 watts continuously and has a peak capacity of 500 watts. Like the Large Advent, the Legacy is a two-way system based on a 10-inch long-throw woofer in a sealed (acoustic-suspension) enclosure. The 1½-inch length

of the woofer's voice coil, which is wound with copper-clad aluminum wire, ensures that it remains in a uniform magnetic field even at high volume levels. The system crosses over at 2,500 Hz to a 1-inch ferrofluid-filled soft-dome tweeter. There are no external level or balance adjustments. The key performance specifications for the Legacy include a frequency response of 42 to 23,000 Hz  $\pm$  3 dB, a nominal impedance of 8 ohms (6 ohms minimum), and a sensitivity of 88 dB sound-pressure level (SPL) at 1 meter on-axis with a 1-watt input.

The Advent Legacy is a floor-standing system, measuring 28¼ inches high, 16 inches wide, and 9¾ inches deep. It weighs 46½ pounds. The cabinet is constructed of fiberboard, with black textured-vinyl coating on its sides and back. A black removable grille cloth covers the front, and the base trim and top are solid oiled pecan. Price: \$199.95



each. Advent, Dept. SR, 4138 North United Parkway, Schiller Park, IL 60176.

## Lab Tests

The averaged room response of the Advent Legacy was very smooth and uniform from 300 Hz to beyond 19,000 Hz, varying only  $\pm 2.5$  dB over that range. We found an increased output at lower frequencies, an effect that is dependent

*The smooth-sounding Advent Legacy is called "digital ready" because of its power-handling capabilities. It can easily handle 100 watts of continuous input and up to 500 watts on peaks.*

on the room acoustics and the placement of the speakers and microphone. We measured the woofer response separately with close microphone spacing to eliminate room effects. It was at its maximum at 130 Hz, falling at about 3 dB per octave above that frequency and at 12 dB per octave below it. When the woofer curve was spliced to the room-response curve, the composite response showed a bass rise of about 5 dB at 100 to 130 Hz relative to typical response levels in the higher frequency range. Overall, the system response was flat within  $\pm 5$  dB from 36 to 19,000 Hz.

Quasi-anechoic FFT response measurements at a 1-meter distance confirmed our room measurements insofar as smoothness and frequency limits were concerned. They also revealed that the Legacy has excellent dispersion. The response measured on-axis and 30 degrees off-axis diverged significantly only above 12,000 Hz. The system's impedance reached its minimum of 6 ohms at 130 Hz and its maximum of 23 ohms at 53 Hz. Over much of the audio band, the impedance was not far from its 8-ohm rating.

The measured sensitivity of the Advent Legacy was 89.5 dB, slightly better than rated. With the speaker driven by a 3-volt signal (corresponding to a 90-dB SPL in the midrange), the bass distortion was in the range of 1.5 to 2 percent from

100 Hz down to 70 Hz, increasing gradually to 3 percent at 50 Hz and 6.4 percent at 40 Hz. The speaker's power-handling ability was confirmed by our tests. At 100 Hz its output began to distort at 410 watts (into 6 ohms), and at 1,000 Hz the waveform clipped at 300 watts (into 14 ohms). Both of these measurements were made close to the woofer cone. At 10,000 Hz we measured the output of the dome tweeter, which required an input of 770 watts (into 6.5 ohms) before its acoustic output waveform became visibly distorted.

## Comments

The Advent Legacy had a smooth, easy listening quality, with a trace of upper-bass heaviness. It has been many years since we tested (or heard) one of the Large Advent speakers, and our test methods have evolved to such a degree in the past eighteen years that little or no correlation would be possible between our earlier measurements and those made on the Legacy. We have the impression that the earlier version had a somewhat more extended deep bass but that the Legacy has better overall smoothness and dispersion characteristics.

The frequency-response curves that Advent ran on our test samples (under very different conditions than we used) showed a comparably smooth and flat response, though without the low-frequency emphasis that we found, which would be quite dependent on the speaker's acoustic environment.

In any case, such comparisons would be pointless. The Advent Legacy is well able to stand on its own merits. It is certainly a more attractively styled product than its predecessor, thanks to its rounded edges and wood top and base trim. Since its price, in 1986 dollars, is only about 50 percent more than that of the original model, in 1968 dollars, it obviously represents an excellent value for today's audiophiles.

Although we have no idea how well the old Large Advent speaker would have withstood the high-power pulses we applied to the Legacy, it certainly was not specifically designed to absorb peaks of hundreds of watts without distortion or damage. No matter how you look at it, or listen to it, the new Advent Legacy does credit to the Advent name.

**Circle 141 on reader service card**



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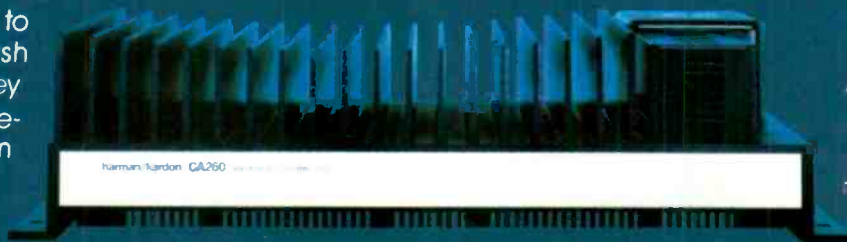


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CIRCLE NO. 14 ON READER SERVICE CARD





## REVOLVER TURNTABLE

*Julian Hirsch, Hirsch-Houck Laboratories*

**T**HE Revolver is a two-speed turntable manufactured in England by Sundown Electronic Engineering, Ltd. (S.E.E.). It is sold in the United States as a complete record player, fitted with a Linn Basik LV X tonearm and Linn Basik moving-magnet cartridge. Its disarmingly simple exterior conceals some unusual and quite sophisticated design features.

The Revolver's 2-pound platter, like its mounting base, is constructed of a dense fiberboard. It is belt-driven by a small a.c. synchronous motor. The motor shaft carries two pulleys of different diameters, for 33 $\frac{1}{3}$  and 45 rpm, that are fully exposed and accessible above the base surface, and the rubber belt rides on the smooth, ungrooved outer rim of the platter. The speed is changed by manually shifting the belt to the appropriate pulley diameter. The belt, circular in cross section, is about  $\frac{1}{16}$  inch in diameter and operates under very low tension. Since the speed is determined by the power-line frequency, there are no vernier adjustments.

The turntable spindle rotates in a precision sleeve bearing. During installation, a drop of oil (furnished

with the unit) is placed in the bearing sleeve before inserting the spindle. Because of close dimensional tolerances, the shaft requires several hours to descend fully into the sleeve after the platter is installed. The manufacturer also recommends that the turntable be "run in" for several hours in order to achieve its optimum performance.

Two components of the Revolver have unusual names, the Pig and the Starmat. The Starmat (for Standard Analogue Record Mat) is a flat record mat, about  $\frac{1}{16}$  inch thick, made of polyester fibers and filled with finely divided carbon particles. It is electrically conductive and drains off static electricity from the disc to the system ground through the spindle. The Pig (for Precision Instant Grip) is a small rubber device that is pushed down over the spindle to hold the disc firmly against the mat.

The unique construction of the Revolver is not visible or otherwise apparent to the user. The base consists of a sandwich of two fiberboard platforms. The lower platform measures 16 $\frac{1}{2}$  x 14 $\frac{3}{8}$  x  $\frac{3}{4}$  inches and is supported on three large, soft, molded-rubber feet. The

upper platform, which carries the motor, turntable, and tonearm, is 15 $\frac{3}{4}$  x 13 $\frac{1}{2}$  x  $\frac{1}{2}$  inches. Holes in the lower platform provide clearance for the turntable bearing and the tonearm base. The pushbutton power switch is located at the front left of the upper platform.

The upper platform, which at first seems to be rigidly coupled to the lower one, is actually separated from it by two thin foam-rubber strips that help to isolate the playing components from vibration entering through the mounting feet. The rear corners of the upper platform also carry lead weights, which pass through clearance holes in the lower platform. Presumably these weights provide the mass distribution required for optimum performance of the isolation system.

The Linn Basik LV X is a well-made but relatively inexpensive tonearm fitted with a universal plug-in headshell. The rotating counterweight carries large, clearly visible tracking-force calibrations at intervals of 0.1 gram, and the cueing lever is located at the arm's base. An arm rest with locking clip extends forward from the base, and the antiskating dial (which can be adjusted while playing a record) is located below the arm rest. The Linn Basik cartridge is fitted with a spherical stylus; its radius is unspecified but is presumably close to 0.7 mil. According to the Revolver's instruction manual, the cartridge should be operated at a vertical tracking force between 1.7 and 2.0 grams.

The Revolver turntable, which weighs slightly over 14 pounds, is available in red, gray, or black-ash veneer and is furnished with a hinged, tinted-plastic dust cover. The integral 4-foot signal cable is fitted with gold-plated connectors. The price of the complete system is \$500 in red or gray finish, \$550 in black-ash veneer. Revolver, Music Hall, Dept. SR, 108 Station Rd., Great Neck, NY 11023.

### *Lab Tests*

We used a 1.8-gram tracking force for our tests of the Linn Basik cartridge, although we also checked its tracking at forces as low as 1.25 grams. Other than balancing the arm (since the Revolver is shipped



with its counterweight removed), we made no adjustments to the system. We also measured the effective mass of the arm/cartridge combination, the accuracy of its tracking-force adjustments, its tracking error, the antiskating dial calibration, and the effectiveness of the arm-lift (cueing) system in raising and lowering the pickup without changing its playing point on the record. We removed the cartridge shell from the tonearm and measured the capacitance to ground of the left and right signal channels.

Other tests of the cartridge included its frequency response, crosstalk (channel separation), output voltage, tracking distortion with several test records, low-frequency resonance in the Basik arm, and ability to track warped records. Listening tests of the complete Revolver system involved not only a variety of music recordings but several test records designed to establish the tracking abilities and limitations of a cartridge. Another system test evaluated the effectiveness of the base isolation system in reducing the transmission of vibration through the mounting feet to the pickup.

The cartridge output was 3.85 millivolts at a recorded velocity of 3.54 cm/s. With a total cartridge load of 47,000 ohms and 170 picofarads (100 in the arm and signal cable wiring plus 70 in our external connections), frequency response was flat from 40 to 6,000 Hz with the CBS STR 100 test record, rising smoothly to a maximum of +8 dB at 17,000 Hz. The channel separation was 21 to 24 dB from 500 to 12,000 Hz and remained a very good 15 dB all the way to 20,000 Hz. The two channels were unusually symmetrical, giving exactly the same output voltage and virtually identical response and crosstalk curves. The vertical tracking angle of the stylus was 20 degrees.

The high-velocity tracking tests indicated that the Linn Basik, despite its low price (\$75), is an excellent cartridge. At 1.25 grams it was able to play our low-frequency test record (the Cook 60), the midfrequency (1,000-Hz) Fairchild 101, and the 60-micrometer level of the German HiFi #2 record (300 Hz). At the 1.8-gram force we used

throughout our tests, the cartridge tracked the 80-micrometer level of this last record (some incipient distortion was audible at 70 micrometers, but it did not constitute what we would consider mistracking). Finally, the 90-micrometer level of the DIN 45-549 tracking-test record was playable at 1.8 grams. The Basik cartridge also produced a visually perfect sine wave from the 30-cm/s 1,000-Hz signals on the Fairchild 101 test record.

The combined effective mass of the arm and cartridge was a moderate 22 grams, which resonated with the stylus compliance at an ideal frequency of 9 to 10 Hz. The system was only average in its ability to track badly warped records, however. The Linn Basik LV X arm was easy to balance, and the readability and accuracy of its stylus-force indications were exemplary. The largest error (compared with an accurate balance gauge) was 0.1 gram, but at most settings there was no measurable error. The antiskating dial, like most we have seen, had to be set slightly higher than the tracking force in order to exert an equal force on both groove walls, but we found a 2.5-gram antiskating setting to be satisfactory for all tracking forces from 1.25 to 1.8 grams.

The cueing lift worked smoothly, with a damped descent that took 4 seconds, and there was no detectable outward drift of the pickup during the descent. The Linn Basik is one of only a handful of all the tonearms we have used and tested over the years that can be raised and lowered without repeating several seconds of the record. The solution here is a strip of soft rubber on the lift bar—why doesn't everyone do that? Measuring the tracking error of the arm (an inherently imprecise process for which we use a special protractor) indicated a negligible maximum error of 0.4 degree per inch of radius. A computer plot of the tracking error, based on our measurements of the arm's key dimensions, agreed almost exactly with the measured error.

The turntable's speed was about 0.5 percent slow at 33 $\frac{1}{3}$  rpm and almost exactly correct at 45 rpm. The flutter measured 0.1 percent rms with JIS weighting and  $\pm 0.15$  percent DIN peak weighted. The

rumble was -41 dB unweighted, -55 dB with ARL weighting, and -59 dB with DIN B weighting. The isolation afforded by the two-stage decoupling system of the Revolver was good but not outstanding. There was one narrow transmission peak at 10 Hz, a larger one at about 30 Hz, and a smaller one at 90 Hz.

## Comments

Our experience with the Revolver confirms a principle that we have long found to be valid: a simple, basically competent product design is most likely to offer the optimum combination of performance, reliability, and cost. No doubt one could come up with record-playing systems providing somewhat better performance than the Revolver in specific respects, but those that really outpointed it in any meaningful way would be considerably more expensive and quite probably less satisfactory in one or more other respects, such as ease of setup and handling or reliability.

For those people who are primarily interested in listening to records and do not particularly relish a protracted setup process involving endless minute adjustments of cartridge position, etc., we can heartily recommend the Revolver system. We were quite favorably impressed by the excellence and functionality of the Linn Basik LV X arm and by the obvious quality of the Linn Basik cartridge. The cartridge's high-frequency emphasis, most of it between 10,000 and 20,000 Hz, looks alarming on graph paper, yet we never heard any undesirable sound quality that could be attributed to it. In performing its essential task of tracking high recorded levels over a wide frequency range without audible distortion, the cartridge proved to be outstanding. And on the turntable's part, audible hum, rumble, and flutter were simply nonexistent at any usable listening level.

The Revolver represents a balanced combination of components that deliver a high level of performance and reliability at a price that, by current standards, is quite moderate. The serious phonophile whose taste surpasses his budget should find it a worthwhile addition to his music system.

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## KLIPSCH FORTÉ SPEAKER SYSTEM

*Julian Hirsch, Hirsch-Houck Laboratories*

**T**HE Klipsch Forté is a three-way floor-standing speaker system that combines a vented direct-radiator woofer with horn-loaded compression drivers for the midrange and high frequencies. The 12-inch Klipsch-designed woofer has a 9-pound magnet structure, and its low-bass output is augmented by a 12-inch passive radiator.

The first crossover, at about 800 Hz, is to a midrange driver with mouth dimensions of 9 x 2 $\frac{3}{4}$  inches. At about 6,000 Hz there is a second crossover to a new Klipsch tweeter whose mouth is 4 $\frac{3}{8}$  inches wide and 2 inches high. According to the manufacturer, the tweeter has an exceptionally uniform beamwidth and a smooth response extending to 20,000 Hz. The Forté, whose nominal impedance is 4 ohms, is a highly sensitive speaker rated to deliver a 96-dB sound-pressure level (SPL) at 1 meter with an input of 2.83 volts.

The woofer is located slightly above center in the speaker board, with the two horns directly above it and as close as their sizes permit. The low-frequency passive radiator,

which externally resembles the driven woofer cone, is located on the rear panel directly behind the active driver. The system has no eternal level adjustments. Its binding-post terminals, on  $\frac{3}{4}$ -inch centers, are recessed into the rear of the cabinet. The front is covered by a removable black grille cloth retained by snap fasteners. The Forté measures 35 inches high, 17 inches wide, and 12 inches deep, and it weighs 65 pounds. The cabinet is available in several choices of oil-finished wood veneers. Price: \$1,100 per pair. Klipsch & Assoc., Dept. SR, P.O. Box 688, Hope, AR 71801.

### Lab Tests

The room response of the Klipsch Forté was one of the widest and smoothest we have ever measured, varying only  $\pm 2$  dB from 230 to 20,000 Hz. The combined bass output of the driven and passive cones had a small peak at 45 Hz and another one, about 6 dB larger, at 150 Hz. This curve could be spliced easily to the room curve, producing a composite response curve varying only  $\pm 5$  dB from 40 to 20,000 Hz. Most of that variation was in the

range of 40 to 200 Hz, where the response would be strongly affected by the room dimensions and placement of the speakers. The low-bass output of the Forté dropped rapidly below 40 Hz. The installation instructions note that the system's low-frequency cutoff is at 35 Hz and suggest using a low-cut filter in the amplifier to prevent overloading the speaker with infrasonic signal components.

Klipsch speakers have long been noted for their high sensitivity and low distortion, and the Forté follows in that tradition. Its measured output, driven by 2.83 volts of pink noise in an octave band centered at 1,000 Hz, was 95 dB SPL at 1 meter—one of the highest figures we have measured from a home speaker. To develop the 90-dB SPL that we use as a reference for bass-distortion measurements, an input of 1.6 volts was required.

The Forté's low-frequency distortion was by far the lowest we have ever measured from a speaker. Measured at the driven cone down to 50 Hz (the effective acoustic crossover to the passive cone) and at the passive cone below that frequency, the distortion was less than 0.2 percent from 100 to 50 Hz. It rose gently to a mere 1.5 percent at 23 Hz, which, because of the rapidly falling output of the system, was the lowest frequency for which we could make a measurement.

The system's minimum impedance was 4 ohms at 150 Hz, which was also the frequency of its maximum output. The impedance rose to a peak of 20 ohms at 65 Hz, then dropped back to 5 ohms at 42 Hz, rising again to about 19 ohms at 20 Hz. It reached an unusually high 130 ohms at 2,200 Hz, then descended to the range of 8 to 12 ohms between 6,000 and 20,000 Hz.

Quasi-anechoic FFT response measurements made at 45 degrees off-axis showed appreciable horizontal directivity over most of the audio range. At 30 degrees off-axis, however, the response was very close to the on-axis measurement over the full range of the speaker. These measurements underscored Klipsch's suggested placement for optimal stereo imaging, which is to aim the speakers inward toward the listeners so that they can "look

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Front view of the Klipsch Forté (left) shows its two horn-loaded drivers and the woofer; rear view shows its passive radiator, directly behind the woofer.

down the throat of each horn." We followed this recommendation with very satisfactory results, although it did not appear to be a critical requirement.

The phase response of the Forté was good over the range of each of the high-frequency drivers, with an overall group-delay variation of 0.6 millisecond from 6,000 to 20,000 Hz and even less than that in the midrange band from 800 to 6,000 Hz. There was a distinct step in the group-delay measurement at 6,000 Hz, however, apparently caused by the different effective path lengths from the two horn-loaded drivers—approximately 2 inches and 9 inches for the high and midrange horns, respectively. The path-length differential of 7 inches corresponds closely to the measured group-delay difference of about 0.6 millisecond.

Our pulsed power-handling measurements produced a rattle from the woofer cone at 100 Hz with an input of 415 watts into the speaker's 6-ohm impedance. At 1,000 Hz, the amplifier's protection circuit tripped at about 715 watts into 19 ohms, before any waveform clipping could be seen. At 10,000 Hz the amplifier clipped while delivering some 1,300 watts to the tweeter's 10.5-ohm impedance! Given the high sensitivity of the Forté, these inputs correspond to truly prodigious sound-pressure levels.

## Comments

Most of the speakers we test are at least competent performers. Each of them is usually average or slightly better in its price/size class in some respects and below the average in others. Even when the sound of a speaker is perfectly acceptable, and perhaps even especially enjoyable, it is difficult to make any dogmatic statements concerning its standing relative to its peers. But the Klipsch Forté is so outstanding in a number of its characteristics, and good or better in just about all the others, that we cannot pass it off as "just another good speaker." For one thing, it sounded even better than it measured.

Our initial impression of the Forté, before we made any measurements, was very favorable: superb overall octave-to-octave frequency balance, unusually wide extension of both low and high frequencies, and the absence of most of the usual speaker colorations (heavy midbass, sharp or dull highs, "honkiness," etc.). The sound had an open, airy quality that contributed markedly to our listening enjoyment.

We were disconcerted at first to hear a greater than usual hiss level on some FM programs. Was it possible that the speaker had a peaked high end? Not at all, as we found when playing CD's, which were reproduced with startling impact and not a hint of stridency. What we interpreted as a high-frequency emphasis was really due to the contrast between the Klipsch Forté and another system we had been listening to that has a somewhat soft (but nonetheless adequate) high-end response. As our measurements later proved, we were hearing a more accurate high-end response from the Forté than we have heard from most of the speakers to come our way in recent times.

We also noted with interest—and approval—that Klipsch has not included user controls to alter the speaker's frequency balance. Our experience has been that designers of really fine speakers almost never give the user the option of degrading the response they have provided. And if controls *are* included, they should have only a very limited effect.

The Forté's bass response was not as surprising—it is hard to imagine a Klipsch speaker being bass shy! Nonetheless, the bass seemed to reach downward beyond what we have usually experienced with other speakers. In this case it was the measurements that yielded unexpected results. It sounded as though the speaker might have reached to 30 or 35 Hz, but, by design, it simply won't get down to those depths. Yet the Forté is so potent in the region where there is real bass content in music, and it adds such a minute amount of bass distortion, that it gives the impression of generating an octave of bass beyond its true limit.

*The Klipsch Forté is so potent in the region where there is real bass content in music, and adds so little bass distortion, that it gives the impression of generating an extra octave of deep bass.*

The installation instructions advise placing the speakers at least an inch from the back wall to let the passive radiators operate properly. Practical considerations required us to keep them about 2 feet from the wall, but this certainly did not impair their performance in any way. Because of the very high sensitivity of the Klipsch Forté, we were able to play the speakers as loudly as we wished from a moderately priced 60-watt receiver. Since the Forté is about 8 dB more sensitive than most home speakers, this combination can provide listening levels that would require 150 watts with the average speaker.

It is not easy to be dispassionate about the Klipsch Forté. Its distortion and sensitivity measurements are so outstanding that comparison with most other speakers is impossible. In addition, these speakers just plain sound so good that we will hate to pack them up and send them back to Hope, Arkansas! In absolute terms, and especially at its price, the Forté would be hard to match, let alone surpass.

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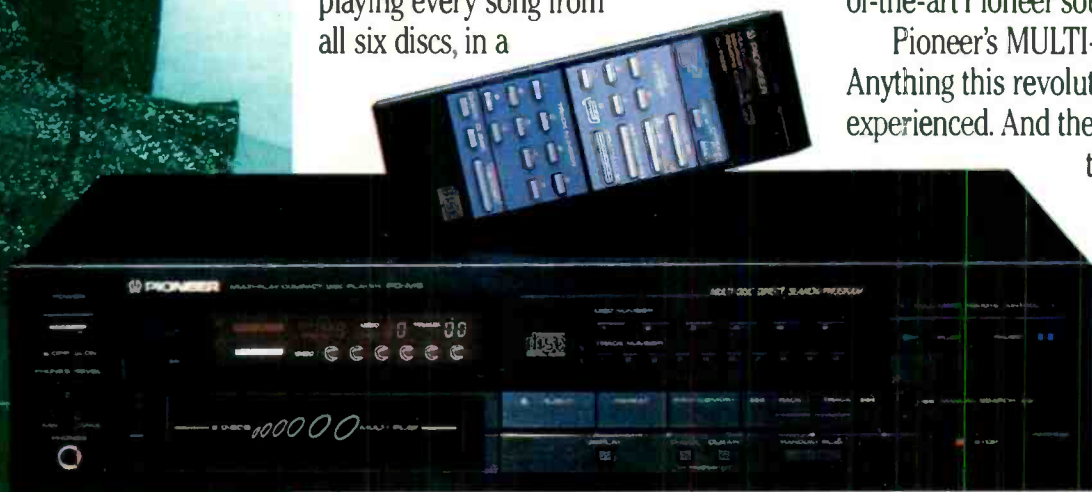
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# JAPANESE

## AUDIO TECHNOLOGY TODAY & TOMORROW



by BRYAN HARRELL

TOKYO, June 1986—To someone in the United States the Japanese consumer electronics industry may look like a huge, smooth-sided monolith. As an American living in Japan and working in that industry, however, I see it as much more complex and varied, almost like a mosaic. To get an overview of the current state of Japanese audio technology I interviewed representatives of some prominent manufacturing firms as well as leading audio journalists, and they revealed even more variety of opinion than I expected.

"Many Americans might think we're like *kintaro ame*," said Hirotsugu Saito. One of Japan's best-known independent audio critics and industry advisors, Saito was referring to the traditional Japanese candy extruded in long, fat strands and cut crosswise in countless pieces that all reveal the same comical face. The Japanese audio/video industry, Saito explained, is in reality made up of hundreds of dynamic individuals with differing personalities who come to agreement only after numerous sessions of *nemawashi* (literally, "digging around the root of a plant"), what the Japanese call their long and arduous decision-making process.

Saito is right. Despite its image as a gigantic seamless automation, the Japanese audio industry is a collection of interesting personalities with differing points of view. How else could it be one of the most innovative and rapidly evolving industries in the world?

Even among the leading audio manufacturers there are refreshing differences in corporate character. Matsushita, known for its Technics and Panasonic brands, is a huge industrial conglomerate where key employees stay on for life and rise slowly up the seniority ladder in traditional Japanese fashion.

Sony, on the other hand, cuts a more dashing figure with a visible turnover of people at all levels, reflecting a stronger emphasis on hands-on talent than on company loyalty. Between these extremes is a rainbow of firms all struggling with their visions of the future of electronic home entertainment.

But in practical terms, the future is already here. Digital audio technology has created a revolution, with the Japanese rushing to apply the principles of pulse-code signal modulation to everything in sight and sound from headphone stereos to still video snapshot cameras. If the Compact Disc really knocked you out, you'd better brace yourself for the surprises the Japanese have in store for you in the next several years.

Opinions on the Compact Disc vary, and many think it's not the Final Answer. With component DAT (digital audio tape) decks to be announced any day now and record/playback Compact Discs just over the horizon, some insiders think the days of the Compact Disc are numbered. Hiromitsu Nakazawa, chief editor of the lead-

*Japan, an archipelago near the Asian coast, consists of four principal islands (Honshu, Hokkaido, Kyushu, and Shikoku) and about a thousand lesser ones. A bit smaller than California, it has a population of approximately 119.5 million people.*

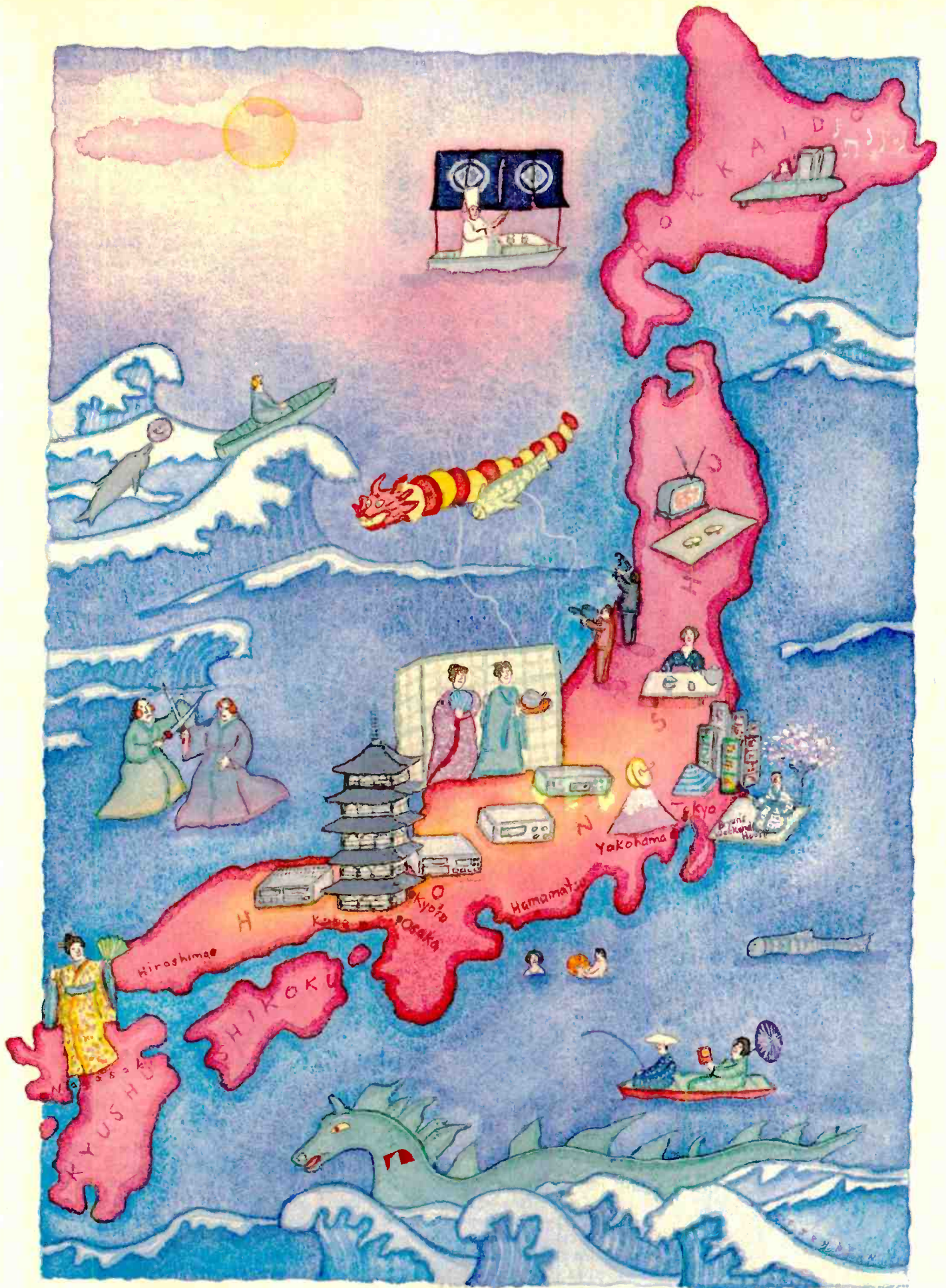
*The industrialization of Japan, which began in the nineteenth century, has made it one of the richest and most powerful countries in the world. Since World War II it has become a leader in technology, and electronic products are among its principal exports.*

*Japanese audio manufacturing is limited to Honshu, and few (if any) factories making hi-fi equipment are found on the other islands. Such factories are located in all parts of Honshu, with the greatest concentration in an industrial corridor that stretches roughly from Tokyo to the Osaka area.*

*The main offices of most well-known audio companies are in the Tokyo metropolitan area. They are Aiwa, Akai, Alpine, Audio-Technica, Clarion, Denon (Nippon Columbia), Fostex, Hitachi, JVC (Japan Victor Corporation), Kenwood, Luxman, Marantz, Micro Seiki, Mitsubishi, Nagaoka, Nakamichi, NEC (Nippon Electric Corporation), Pioneer, Sansui, Sanyo, Sawafuji, Sony, TDK, Teac, and Toshiba.*

*Those located in the Osaka metropolitan area are Maxell, Onkyo, and Matsushita (Panasonic, Quasar, and Technics). Accuphase is in Yokohama, Fujitsu Ten in Kobe, Kyocera (Kyoto Ceramics) in Kyoto, Sharp in Hiroshima, and Yamaha (Nippon Gakki) in Hamamatsu.*









TOHRU NAKAMURA



Sony's latest CD players, such as the CDP-203 (top photo), use a single master clock to control all operations in the digital domain, which is said to reduce beat frequencies that can muddy the sound. The CDP-203 has a twenty-key remote control for virtually all functions, including random access to any track. A Shuffle Play feature programs random-order playback for all tracks on a disc.

Like Compact Disc players, Yamaha's LV-X1 video LaserDisc player combines optical-disc and digital-audio technologies.

ing Japanese audio monthly, *Musen To Jikken* (*Stereo Technology*), thinks the CD's decline (along with the yet-to-be-released DAT) could happen as early as ten years from now as prototypes of completely solid-state RAM (random-access memory) player/recorders make their appearance.

Saburo Egawa, a well-known audio critic and acoustic researcher, pushes the CD's dethroning date up to "five years from now," though he concedes that the CD will continue to be available for a while as "one of many digital audio formats" because of its suitability for mass-market use. A popular contributor to Japan's numerous audio publications, Egawa thinks that current digital recording techniques are "still really low-grade compared to what we can expect in the future."

Dr. Heitaro Nakajima, one of the key Japanese developers in the commercialization of the Compact Disc format and currently president of Aiwa Co., Ltd., takes a studied his-

torical perspective. "Edison started it all in 1877, and since then we've seen a consistent pattern of change in audio formats "every twenty-five years. The analog LP is far from dead, but it will certainly go the way of the 78 in time." When asked what new format will be making headlines in 2007, Nakajima replied, "It's hard to imagine, just as we couldn't imagine the Compact Disc twenty-five years ago." Then, with a twinkle in his eye, he leaned forward to add, "That's for the next generation to figure out. Personally, I'm happy to sit back and enjoy the Compact Disc."

Denon's digital recording expert Takeaki Anazawa is also certain that the CD will be with us for a long time. Citing the current limitations in RAM and bubble-memory capacity and how slow their application to audio has been, Anazawa thinks prototypes of electronic-memory record/playback systems won't appear until the end of this century.

"Sure, the CD will still be around at the turn of the century," agrees Kosei Wada, influential publisher of a large group of audio magazines. "There may be a smaller version, say 8 centimeters, for portables, and videodiscs might become as small as CD's," he adds, noting that to be truly successful software must fit comfortably in the human hand. (Among his publications is *Digital Sound* magazine.) Wada thinks the CD will endure longer than previous formats because they "just don't deteriorate," and he "can't imagine RAM music systems in the near future."

Even more bullish on the Compact Disc is Nobuo Kanoi, a robust managing director of Sony and senior general manager of that company's Audio Group. "In less than ten years the Compact Disc will [supplant analog systems and] take 100 percent of the market," Kanoi says. He thinks that formats using RAM data storage won't happen because "it's a basic calculation problem." He waves a Compact Disc in the air. "Look. This holds 0.6 gigabits of data. Now where are you going to put all that on a memory device? We're nowhere near that now." Citing new CD applications in data storage and electronic book publishing, Kanoi asserts that "the Compact Disc will be with us well beyond the year 2000."

In Japan, the solid success of the Compact Disc is already evident. CD players are now standard equip-



ment on all but the lowest-priced one-brand systems, and portable CD players are selling like conveyor-belt sushi. For consumers, the audio press, and the industry alike, it's all good news. On the software side, the Japanese consumer pays only slightly more for Compact Discs than for analog records, which have always been expensive here. And industry publications are now predicting that 1986 will be the year that Compact Disc players overtake analog turntables in terms of numbers manufactured. Pretty impressive performance for a product that didn't exist five years ago. But the Compact Disc is only the beginning in the new world of digital audio.

### Digital Audio Tape

This summer, several manufacturers are expected to announce the release of long-awaited DAT (digital audio tape) equipment for consumer use. The tapes themselves will be half the size of conventional cassettes and will be capable of recording up to two hours. Audio critic Hirotsugu Saito, who seems to be on the inside information track, foresees initial prices in Japan to be low: approximately 50,000 yen (\$285 at the press-time conversion rate of 175 yen to the dollar) for a pocket stereo player and 80,000 yen (\$459) for a component deck.

Making use of a rotating drum head, the R-DAT format has many variations including record/playback with a 48-kHz sampling rate and playback-only with a 44.1-kHz sampling rate, the same as that of the Compact Disc. The variation is apparently a conscious attempt by the manufacturers to make it impossible—or at least extremely difficult—for amateur audio hardware hackers to make direct digital-to-digital copies of Compact Discs.

For record companies, however, producing prerecorded DAT copies is expected to be relatively easy thanks to a "magnetic contact print" technique. The master and blank tapes are put together and whisked through a magnetic field at a dizzying speed, resulting in prerecorded DAT software production costs that are considerably lower than the still-expensive CD pressing process.

Dr. Nakajima of Aiwa is particularly pleased with DAT's four-mode system, which provides four levels of recording quality just as VCR's do with their different speeds. The DAT differences derive from the different sampling frequencies

(from 32 to 48 kHz) and quantizations (12 to 16 bits) used in the different recording modes. Nakajima expects that users will select an appropriate mode for each application, from "digitally encoded satellite broadcasts to car audio."

Will DAT catch on as fast as the CD? Sony's Kanoï doesn't think so, speculating that "significant consumer acceptance will probably take five to seven years." Bunzaburo Sugimura, director of product planning at Alpine car audio, also thinks DAT will take longer than the CD to catch on, noting that the availability of prerecorded DAT software will play an important role.

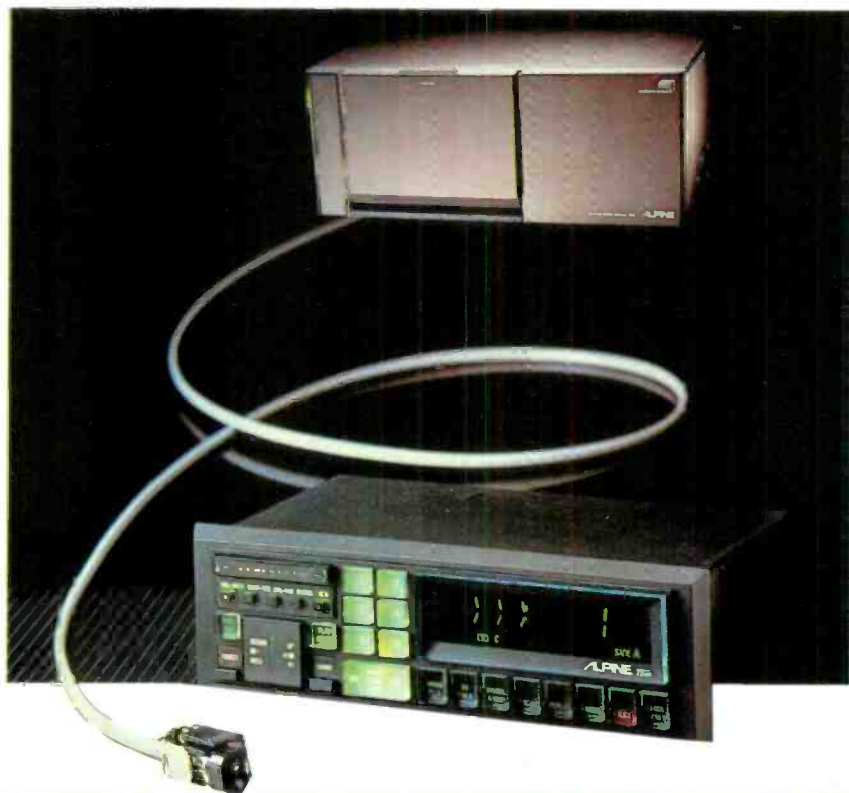
Will DAT make cassettes obsolete? "Analog cassettes will be going strong for at least another ten years," confidently answers Niro Nakamichi, president of the Na-



*Pioneer's CLD-900 (below, upper photo) can play 12-inch LaserDiscs, 8-inch LaserDiscs, and Compact Discs. It*

*can play back digital soundtracks from videodiscs as well as the standard analog soundtracks.*

*Alpine's Model 7375 car stereo cassette changer (lower photo) mounts in the trunk to protect it against theft. Fiber-optic cables between the changer and the control unit protect the audio signal from noise and interference.*





kamichi Corporation, founded by his brother. "DAT still has some problems that concern us," he says in a more serious tone, "so we don't plan to release anything until we're satisfied with the results. If the kinks in DAT are ironed out and the format gains acceptance, then our R&D emphasis will shift and we'll lead in DAT as we do with cassettes."

As far as RAM digital audio is concerned, Nakamichi is in agreement with Nobuo Kanoi of Sony: "The cost per bit of storing information is far too high when compared with optical systems like the Compact Disc. Cassettes became so popular because the cost of the medium was low. Besides, audio doesn't really need the kind of high-speed access that RAM provides."

Where we are eventually headed, Nakamichi feels, is toward recordable magneto-optical digital discs, citing an industrial data-storage system he unveiled nearly two years ago. "We don't have any standards now for a home-use audio format, but it's in the future."

Yasumasa Muroi, manager of business development and product planning for Sansui's Home Electronics Division, agrees, predicting the emergence of recording CD units in about three years. "The big-

gest problem is the disc material," he explains, suggesting that the most probable system is one that will use magnetic technology for recording and optical technology for playback.

### Digital Driving

Niro Nakamichi is also cautious about car CD players. "We would put out a car CD player if it were really usable. In practical terms, we can't expect people to buy two of every Compact Disc they want just to leave one in the car." Other problems Nakamichi mentioned were that CD's make greater demands on car amplifiers and speakers than cassettes, that they are slightly more troublesome to handle, and that their extra dynamic range is impractical in the noisy car environment. "And I'd be surprised if anyone could actually tell the difference between our car audio cassette decks and a Compact Disc player in actual use," Nakamichi adds.

Alpine's Sugimura doesn't expect DAT on a large scale for car audio until 1990 because "it is extremely difficult to maintain DAT's necessary micrometer accuracy amidst the vibration, shock, and temperature extremes" of the automotive environment. When asked what kind of audio systems cars will have

in twenty years, Sugimura counters with, "What kind of cars will we have in twenty years?" He says that the "design and operation of vehicles of the future, as well as our attitude toward them, will have a large bearing on the type of sound systems they incorporate."

### Advance Recognition

"Wire, pure and simple. If there's no wire, there's no circuit." Audio critic Saburo Egawa is talking about the LC-OFC (linear-crystal oxygen-free copper) wire developed by Hitachi, which he considers the most important recent advance in audio technology. "We've just begun to understand in what ways wire affects sound quality. And it's in every part of every circuit of every component. No matter how well you've designed the circuit, the best wire helps you reach 100 percent of the circuit's potential."

But just about everyone else thinks the most significant audio advance, in both technical and business terms, has been the shift from analog to digital headed up by the Compact Disc. Indeed, the CD has turned the fortunes of an industry that was in a severe slump just five years ago, with a rejuvenating ripple effect spreading to the amplifier and speaker markets. "This year we'll



*The Technics SL-XP7 portable Compact Disc player is about the size of three CD jewel boxes. It uses a single-beam laser and can be programmed for playback of up to sixteen tracks in any order. A battery pack is built into the carrying case. The player can also run off house current using an a.c. adaptor.*



see the beginning of a second audio boom," predicts audio publisher Kosei Wada, "because the CD has refreshed the market."

Sansui's Yasumasa Muroi admits that the CD is important, though he feels that PCM (pulse-code-modulation) recording and the digitally mastered LP were initially more influential. What will turn out to be bigger, Muroi believes, is the integration of audio and video. "Video is really now part of audio," he insists. "Even something as simple as a pocket stereo can be considered an A/V product because the experience combines music with what you see when you walk around. The future is definitely the A/V experience."

### *The Hear and Now*

The Compact Disc is making headlines, but what kind of advances are the Japanese making in audio staples like pocket stereos, cassette decks, speakers, amplifiers, and other electronic components?

In the May issue of *Musen To Jikken*, chief editor Nakazawa listed what he considered the best five among the new crop of audio products. He gave top billing to Mitsubishi's D-10,000, a pricey (700,000 yen/\$4,000) three-way bookshelf speaker system with a beautiful furniture-like finish. According to Nakazawa, it "incorporates all of that company's technical advances to date." Though the No. 2 and No. 3 slots went to top-class CD player-D/A converter separates from Sony and Hitachi, Luxman's 330,000 yen (\$1,885) LX-560 integrated amplifier with a Class A power stage was selected as No. 4 for its "unique circuits, stable operation, and inherent musicality," while No. 5 was the 228,000 yen (\$1,302) Marantz PM-94 120-watt integrated amplifier with its ingenious "Quarter A" circuit, which operates in pure Class A up to 30 watts.

Indeed, it may be time for electronics and speakers to step back into the spotlight. The most striking products will be new acoustic processors that are far more sophisticated than this past year's crop of first-generation surround-sound systems. In January, Yamaha announced the design of a sound-field processor and a computer simulation system that in combination create what is called a Total RSE (room shape evaluation) system. This high-tech system was recently translated into a consumer product. Called the DSP-1, it uses a small

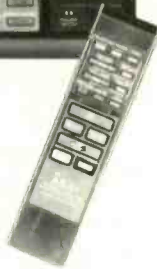
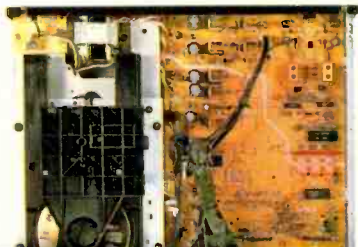


*Aiwa's CV-80 camcorder (top photo) uses 8mm tape in a cassette about the size of a standard audio cassette. Maximum recording time is 2 hours, and the analog mono soundtrack is frequency modulated in the video frequency spectrum.*

*Sony's WM-207 Walkman (lower photo) has an AM/FM stereo radio and an autoreverse cassette player. It is powered by solar cells on its side and features a water-resistant case and folding headphones.*







*Akai's VS-622 (top photo) is a VHS Hi-Fi videocassette recorder that features HQ (High Quality) video circuitry, decoding for stereo and SAP broadcasts, four video heads, on-screen programming, sixteen station presets, and a sleep timer.*

*Onkyo's Integra DX-320 Compact Disc player (center, with inset top view of circuitry and disc drive) uses optical fibers instead of the usual wires to transmit audio signals internally.*

*Denon's TU-767 tuner (bottom) features the Super Searcher System, which is designed to eliminate interference from broadcast intermodulation.*

speaker in each of the four upper corners of a room, in addition to regular speakers, to re-create the acoustic flavor of some of the world's most famous concert halls. Apparently Yamaha engineers have meticulously measured the characteristics of concert halls and studios around the world and put the data onto microchips. All processing is done in digital form with the same quantization and sampling rate as for CD's.

More developments in this area, along with A/V integration, may rekindle interest in four-channel sound according to Sansui's Muroi, who was in charge of promoting four-channel in the U.S. in the early Seventies. "Four-channel died because there was only audio, and four speakers weren't common in the listening-room lifestyle then." Audio critic Hirotsugu Saito believes that the main drawback of four-channel analog sound was improper phase control. Digital signal processing, he says, will take care of this. Saito is also convinced of a bright future for sound-field image processors.

In the area of speaker research, audio publisher Kosei Wada says that JVC is the company to watch, predicting its release of "diamond/sapphire tweeters with incredibly clear sound" in the near future. Wada admits, however, that Japanese speakers still don't reproduce bass well, citing as evidence the popularity of Bose and JBL speakers in the Japanese market. "Young Japanese have become like young Americans in that they like a lot of bass, though the CD sound has a lot to do with it too."

### *High Fidelity Takes a Walk*

Many observers attribute the audio industry's sales slump in the early Eighties to VCR's and the home computer, though some audio insiders here actually blame pocket stereos. With Sony's Walkman delivering big thrills to Japanese in cramped (and far from soundproof) housing, few were interested in buying or upgrading a space-taking home system they could rarely play loud anyway.

Regarding his company's Walkman portables, Sony's Nobuo Kanoi says the market for pocket stereo is fully mature now and that we can expect models specifically designed for every conceivable kind of use. Sony's incredibly diverse Walkman lineup already reflects this versatility, and even Kanoi himself couldn't say off the top of his head

how many types of Walkman are available on the Japanese market.

Dr. Nakajima of Aiwa, makers of the competing Cassette Boy portables, agrees that pocket stereos will be application-specific, speculating that there may be models "specially styled and designed for yachters or golfers." Nakajima also says that models with preset memory tuning are already being developed, and a new version of Aiwa's wired remote-control models will be released in Japan this fall. But he predicts that the Japanese market for pocket stereos will shrink in about ten years as today's baby-boom teenagers become adults, making the fashionability of a unit essential to its success.

As for portable CD players, Nakajima conceded that a wide dynamic range becomes a problem in cars, trains, and other noisy listening environments, saying that "R & D on the proper reduction of dynamic range is also going on, you know." Indeed, a control to reduce (compress) dynamic range may eventually join bass, treble, and balance controls as standard equipment in playback systems.

When asked why Nakamichi has never made a pocket stereo, president Niro Nakamichi said with a puzzled look, "Well, it's not really our style. In the current price structure, there would be too many compromises. If the demand were really there for a very high-quality model, we'd certainly make one."

Perhaps the most astonishing portable prediction comes from audio publisher Kosei Wada. "It's very likely that VHS will be overtaken by the 8mm video format, making it all the more likely we'll soon see a portable videocassette player." Undoubtedly it would even be smaller than the "boom boxes" of today.

### *Innovation*

"IF YOU THINK JAPANESE ARE MASTERS AT COPYING, YOU'RE ABSOLUTELY RIGHT" goes the headline. The year is 1985, however, and the ad in U.S. publications is for a high-tech photocopier from a leading Japanese manufacturer. Apparently the Japanese are now confident enough about their own originality to make light about their past. Nonetheless, original basic concepts haven't sprung easily from the Japanese, as evidenced by the American origination of all of audio's basic building blocks, from vacuum tubes to transistors to IC's.

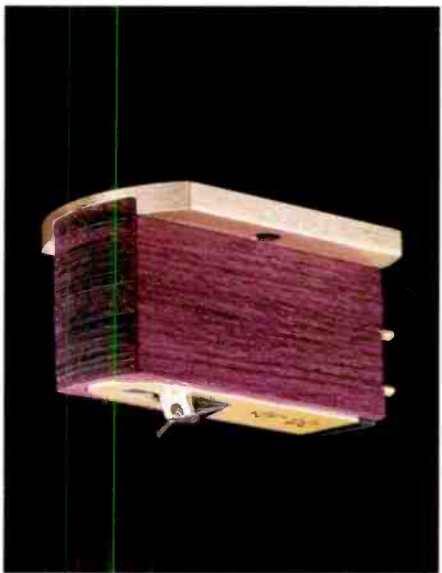
Though nobody in the industry I



*Digital audio tapes, such as this sample from TDK, will be about half the size of ordinary audio cassettes. Rotating heads like those used in video decks will be used to record and playback the wide-band signals required by the digital format.*



*Design Acoustic's PS-30 is a three-piece speaker system whose satellites have 5-inch woofers and 1-inch tweeters. The subwoofer module has a downward-firing 12-inch driver.*



*An ultra-low-mass, super-elliptical diamond stylus is mounted on the sapphire cantilever of Kiseki's Purpleheart moving-coil cartridge. Each unit is handmade and has a solid aluminum-alloy mounting plate and wood housing.*





*Nakamichi's top-of-the-line autoreverse Dragon cassette deck (upper photo), a classic design, automatically adjusts the head azimuth to correct imperfect alignment.*

*You can load seven cassettes into Mitsubishi's three-head DT-156 cassette changer (lower photo) for 10½ hours of music. You can also program it to play up to nine individual selections from any of the cassettes in any order you want.*

talked to ventured to comment about the originality of Japanese electronic engineers, the well-known (publicly funded) medical researcher Haruo Shinozaki decried the occasional practice in Japan of "translation research," in which academics virtually rerun (with slightly changed variables) experiments reported in foreign technical journals and present the results in Japanese as original work. And since few R&D people in the West can even read Japanese technical journals, nobody blows the whistle.

The reason for the comparative scarcity of basic, groundbreaking research doesn't lie in the Japanese character itself, but in the fact that Japanese corporations prefer to fund research more directed toward ways of creating products for the not-so-distant future. While Japanese firms take a more long-range view of profits, they take a more practical, short-range attitude toward R&D than high-tech American firms.

In practical technology, the Japanese are performing incredibly well. In almost all areas of manufacturing, the Japanese lead the world in production technology, at making high-quality products at low cost. Their ability to translate new developments into practical consumer products is second to none. With their strong position in most of the world's markets for consumer electronics, the Japanese must be doing something right.

Audio critic Hirotugu Saito points out that the real reason why the Japanese are pushing ahead with new technology and new software formats lies in Asia. Hong Kong, Singapore, South Korea, and Taiwan pose a clear threat to Japanese production superiority because they've recently used their lower-cost labor force to make high-quality products that incorporate existing technology. "DAT and 8mm, and the focus on ever-increasing quality, is how the Japanese plan to stay ahead," says Saito.

Having achieved leadership in the production of consumer electronics, the Japanese may go on to become leaders in design innovation well before the end of this century. A fascinating example of Japanese innovation is the "flat-wave" sound theory of Tadashi Sawafuji, founder of Sawafuji Dynameca, which produces the flat-diaphragm speakers with printed voice coils he designed. Sawafuji's current brainchild is his soon-to-be-released Dynacurve

speaker, which uses a single-pleat-diaphragm driver.

### New Materials

The development and application of new materials is another area where the Japanese excel. It's also an area where they're extremely secretive with the press. At last year's Japan Audio Fair, Onkyo's CD player with optical-fiber signal transmission made big news. The digital and analog sections of the player were completely separate, connected only by six optical-fiber strands that transmit digital information. Yoichi Ide, director of technical development for Onkyo, says that future applications may be found in digital signal-control amplifiers and DAT decks. Already, optical fiber is used to send control signals to Alpine's trunk-mounted cassette changer from the car's dashboard.

In speakers, Onkyo was the first to use cross-carbon fiber in woofer diaphragms, according to Ide. His company has also produced a ceramic-coated tweeter diaphragm. Both Sony and Aiwa have gone all out with headphones, developing models using amorphous-diamond diaphragms with price tags far below jewelry-store levels. And Sawa-fuji is now using high-performance nylon- and plastic-based magnets in several speaker models.

Interestingly enough, the most fascinating use of exotic materials is in phono cartridges. Cantilevers of ruby, boron, and diamond have already been created. Akira Asakura, president of Shinagawa Musen, makers of high-end Grace cartridges, notes that it's now possible to make cantilever tubes out of pure sapphire. But the coming thing in cartridges, he says, are new silicon-nitrogen compounds that are very light and strong and that don't behave like metals during vibration. He also mentions carbon-silicon ceramic compounds as possible new materials for cartridges.

### An Analog Renaissance?

Digital watches are now passé with young Japanese, with remakes of designs from the Thirties, Forties, and Fifties enjoying brisk sales. In the same way, digital sound might just be a passing fancy. Indeed, there are impressive numbers of Japanese audiophiles who eschew the benefits of digital for the merits that they find in analog sound reproduction.

"Audiophiles are starting to split



*Kenwood's Basic M2 power amplifier, rated for 220 watts per channel, has a circuit called Sigma Drive that extends the negative-feedback loop to the speakers in order to compensate for distortions that are caused beyond the amplifier itself.*

*Sanyo's VCR 7150 videocassette recorder can record and play frequency-modulated Beta Hi-Fi soundtracks as well as the standard linear soundtracks. It also features infrared remote control, IC-logic transport functions, and pause/still frame.*





into two distinct categories," explains audio critic Hirotsugu Saito, "the pure audio camp, in which are many analog fans, and the audio/video camp, where digital has total acceptance."

"The Compact Disc just drops dead after 20 kHz because the specs are fixed. Remember, JVC's CD4 system went all the way up to 45 kHz. Analog still has considerable room for improvement [in many parameters], and there are lots of possibilities," says Akira Asakura. "Don't get me wrong—I love digital sound and was on the standards committee, and I'm sure CD's will get better, too." Asakura is continuing analog disc research and tells me he'll even cut his own analog masters in the future if necessary.

More outspoken is audio critic and researcher Saburo Egawa, who declares that he's still committed to analog research because "analog is still the most accurate" form of sound reproduction. The 1960 model Scully cutting lathe parked in his living room is pretty convincing evidence. Egawa waxes eloquent about the future of the analog disc, believing that improvements in vinyl composition are still forthcoming. "Simple is best for more than just aesthetic reasons," he says, "because [the goal of] audio is to capture human feeling."

"While the outside of the human body is analog in nature, the inside of our bodies, especially the brain, operates in a very digital manner," counters audio critic Hirotsugu Saito. He maintains that "digital is more human" because humans are "input/output + interface" devices, the brain being an extensive memory-storage/error-correction system and the ear a kind of A/D converter that changes sounds into pulses the human brain can process. "We've only used a tenth of digital audio's potential," continues Saito, "and I'm sure NASA has some truly great [top-secret] error-correction systems that could really improve digital audio."

Sony's Nobuo Kanoi applauds the age of digital sound. "Synthesizers and digital-to-digital mastering techniques finally give man total control of sound's characteristics," he says enthusiastically.

### *The Human Element*

When asked to comment on the future, Japanese audio researchers become almost philosophic. Akai's vision of the future takes shape in its "creative audio" product-devel-

opment strategy. Shogo Konagai, manager of product planning at Akai, says that he hopes for a shift from passive listening to active creation and enjoyment of recordings. Akai's current synthesizers, mixers, multitrackers, and so forth have been designed for direct integration with Akai audio playback components, making it easy for users to create original recordings for subsequent playback through their sound systems. "We want to close the gap between the home-audio and live-music experiences," explains Konagai, "which is part of a cultural transformation of young people the world over."

Shoichi Kawai, deputy manager of Akai's product planning, adds, "Years and years of practicing to master an instrument are no longer necessary with today's synthesizers. [By keying in different voices], you can play several different instruments right away, and even create sounds never before made by existing musical instruments." Both Konagai and Kawai agree that individual expression will be foremost in future audio enjoyment.

Denon's Takeaki Anazawa, perhaps Japan's most knowledgeable digital recording expert, points out that "technology is only good if it makes music listening more enjoyable." Along similar lines, Yasamasa Muroi of Sansui says, "[Audio] hardware will change, but listening habits and lifestyles will be the same." It's no surprise there's still belief in the primacy of the human listening experience.

"The computer [we use for waveform research] isn't always perfect, so the human ear is still our best judge," says Akira Asakura. "Live music will always be the basis of our original speaker research," asserts Tadashi Sawafuji. Dr. Nakajima of Aiwa sums it up best by saying, "People may eventually get bored [with all the hardware and software]. In the future, I think the real luxury will be to experience a live concert." □

*Bryan Harrell, a music and audio writer from Sacramento, California, is STEREO REVIEW's Tokyo correspondent. Since 1977, he has lived in Tokyo, where he writes a weekly music column for the Japan Times. Harrell is a member of the Japan Audio Society and co-author (with Kazuo Kataoka) of Nichibei Audio Yohgo, a Japanese-language book on practical audio English. He supplied the sample of the traditional candy kintaro ame shown at the top of the next column.*



## JAPANESE AUDIO TERMS

- Broadcast* — hohsoh
- Circuit* — kairo
- Diaphragm (microphone or speaker)* — shindoban
- Distortion* — hizumi
- Electricity* — denki
- Frequency response* — shuhasu tok'sei
- Low frequencies* — tei'on
- Middle frequencies* — chu'on
- High frequencies* — ko'on
- Input* — nyuuryoku
- Live performance (music)* — nama enso
- Music* — ongaku
- Noise* — zatsu'on
- Output* — shutsuryoku
- Playback* — saisei
- Power supply* — den'gen
- Recording* — roku'on
- Semiconductor* — handotai
- Signal* — shin'go
- Terminal (connector)* — tanshi
- Volume* — on'ryo

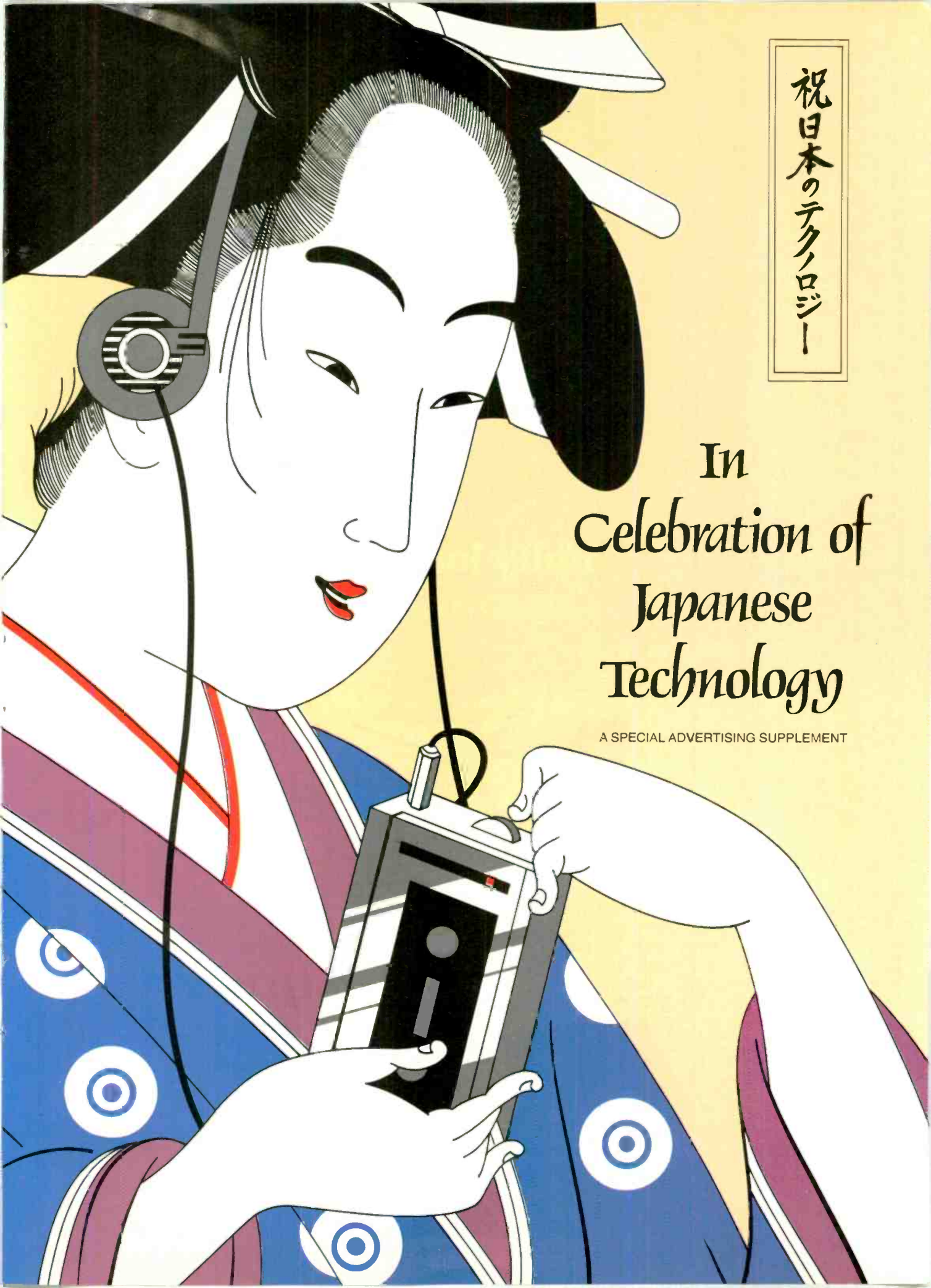
*Many Japanese audio expressions are based on their English-language counterparts, with Japanese pronunciation, and are often contracted as well.*

- Bass reflex* — basurefu
- Cassette deck* — kasetto dekki
- Digital audio* — dijitaru ohdio
- Graphic equalizer* — guraiko
- Impedance* — imupedansu
- Plus/minus (±)* — puramai
- Radio cassette player* — rajikase
- Remote controller* — remokon
- Signal-to-noise ratio* — es'en hi
- Spectrum analyzer* — supeana
- Studio* — sutajio
- Synthesizer* — shinse
- System components (one-brand systems)* — shisukon
- Tape* — tehpu
- Tape recorder* — tereko
- Turntable* — puree'yah
- Tuner* — chuh'nah
- Wow-and-flutter* — wau furattah

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## Fully loaded.



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The world's first car compact disc  
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They've just taken the conven-  
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and turned it into the ultimate  
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Through an ingenious Remote  
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As for high performance,  
the special 10-disc changer  
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The car stereo destined to become  
standard equipment for those  
who have very high standards.



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CIRCLE NO. 62 ON READER SERVICE CARD



# MITSUBISHI: TOTAL DEDICATION TO A/V QUALITY

Unlike most of the larger full-line audio/video manufacturers, Mitsubishi has never chosen to concentrate their design efforts on low-end mass-market products. And with the vast technical resources of their semiconductor and computer manufacturing divisions to draw on, Mitsubishi has certainly never found themselves producing run-of-the-mill, "me-to" audio/video products.

Mitsubishi's success in the highly competitive audio/video marketplace can be attributed to an attention to engineering quality, product reliability, and their distribution methods. It is no accident that many of the very best high-end audio/video dealers feature Mitsubishi products. A dealer's commitment to providing superior video and audio sound quality to his customers makes him a "natural" as a distributor for a company whose products are designed and built following the same philosophy.

## THE BIG PICTURE

Mitsubishi is the undisputed leader in the projection TV market. This position was secured not by superior marketing, but by superior technology. Thanks to a series of Mitsubishi-developed optical-electronic breakthroughs, Mitsubishi projection units have superior brightness, resolution, and clarity. In fact, the picture delivered by Mitsubishi's 40-, 45-, and 50-inch screens clearly equals the best of conventional color television sets. Complementing Mitsubishi's projection units is the world's first—and only—35-inch direct view television set; its screen is 86 percent larger than that of a standard 26-inch set. All products are available in elegant "designer series" furniture styles.

## VIDEO CASSETTE RECORDERS

As might be expected, Mitsubishi has a full line of state-of-the-art VCRs at various price levels. The top model (HS-430UR) is a Hi-Fi HQ VHS stereo unit that includes all the very latest video developments. Mitsubishi's proprietary Fx4 heads significantly enhance picture quality and, in addition, provide stable and noise-free special-effects functions.



*The AV-2600, a complete floor standing A/V system with a 26-inch monitor.*



*Mitsubishi's revolutionary 35-inch direct-viewing monitor/receiver.*

## A/V COMPONENTS

As the perfect mates for the separate video components, Mitsubishi provides a sophisticated line of A/V products including two exceptionally flexible, receivers. In addition to video dubbing the receivers feature video enhancement, noise reduction, and stereo synthesizing circuits.

For those who prefer a completely integrated audio/video system, Mitsubishi makes available the AV-2600. Housed in an oak-veneer wood cabinet, the floor standing AV-2600 system combines a 26-inch monitor, a sophisticated 50-watt-per-channel receiver, a linear-tracking turntable, and a cassette deck. A similar but more compact table-top/shelf model comes with a high-tech black finish and has a 20-inch monitor.

## AUDIO/VIDEO PIONEER

Mitsubishi was one of the earliest companies to appreciate that audio and video components would one day be combined into a complete home entertainment center. Mitsubishi's engineers devoted themselves to ensuring that the video elements in the marriage would be equal partners, that the video quality would be in no way inferior to that of the audio elements. A visit to a Mitsubishi dealer should convince you that they have succeeded brilliantly.

For further information on Mitsubishi's exceptional audio/video products, write to:

Mitsubishi  
5757 Plaza Drive  
P.O. Box 6007  
Cypress, CA 90630-0007

 **MITSUBISHI**



Building history's first 35-inch conventional  
Finding a magazine big enough

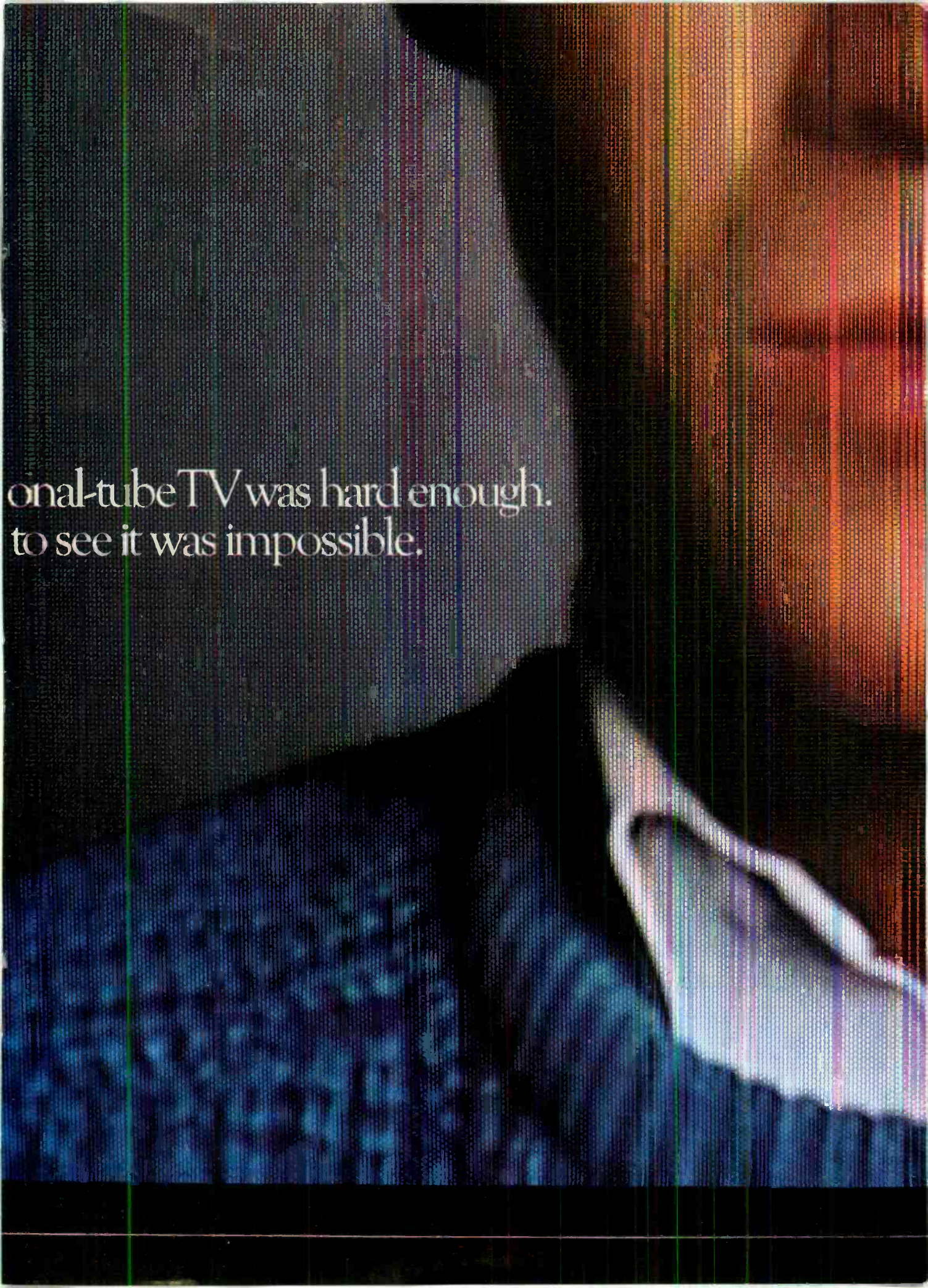
Its picture area is 86% larger than a 25-inch. Its picture is as rich, as sharp, as bright as a 25-inch. But you can see all that. Only at an authorized Mitsubishi dealer.



Mitsubishi Electric Sales America, Inc., 5757 Plaza Drive, Cypress, CA 90630-0007

*Note: actual (or simulated) picture.*





onal-tube TV was hard enough.  
to see it was impossible.



Some people  
don't know  
the first  
thing  
about  
digital audio.





With new companies entering the Compact Disc market every month, it's not surprising that many people haven't the faintest idea how digital audio was developed. Or by whom.

The theory of digital recording was worked out in the 1920's. But it took almost 50 years for someone to build the first digital audio recorder good enough for commercial record production. That someone was Denon.

How did it happen to be Denon? Perhaps because Denon is Japan's oldest record company, with a single-minded commitment to recorded music. Or possibly because Denon is Japan's oldest audio company, with a 75-year tradition of advancing the state of the audio art.

In any case, Denon engineers quickly put their digital invention to use—releasing the world's first digitally-recorded LP and compiling the world's largest library of digital master tapes.

Soon we were making digital-grade amplifiers, digital-grade recording tape, digital Compact Discs, and CD players regarded by many reviewers as the world's finest.

Consider the DCD-1500 Compact Disc Player. *Digital Audio* gave it the highest rating of any CD player under \$1,000. Not bad, considering it retails for \$629.95\*.

And then there's Denon HD8 cassette tape. Our exclusive "High Technoroom" magnetic coating makes it simply the best Type II tape for recording digital sources. And don't miss Denon's PMA-900V

Integrated Amplifier, with the new Pure Current Power Supply for prodigious dynamic range.

So when it comes to getting the latest and best in high-performance digital audio, you have two choices. You can wait for other companies to catch up. Or you can be there first. With Denon.

# DENON

*The first name in digital audio.*

CIRCLE NO. 27 ON READER SERVICE CARD



The first PCM digital audio recorder used in commercial record production, the Denon DN-023R.



Denon's Broadcast Compact Disc Player, the DM-3000F, cues to an accuracy of 13.3 milliseconds.



Denon introduces the finest high-bias cassette for recording digital sources: HD8.



With the highest ranking of any CD player under \$1,000, the Denon DCD-1500 lists for only \$629.95\*.



\*Suggested retail price.



# YAMAHA: ONE HUNDRED YEARS OF TECHNOLOGY DEDICATED TO MUSIC



Even among the larger audio manufacturers, Yamaha stands out as a company with an uncommon involvement in music. Not only is Yamaha the world's largest manufacturer of musical instruments—ranging from concert grand pianos to guitars and synthesizers—but they also operate music schools in some thirty countries around the world.

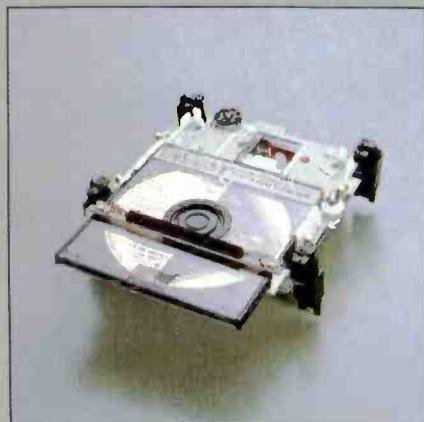
If companies could be personified, Yamaha would surely qualify as a widely talented modern-day Renaissance man—musician, metallurgist, chemist, and mechanical/electronics engineer. These skills combine synergistically to produce exceptional equipment for musicians and audiophiles—those who produce the music and those who reproduce it. It is appropriate that Yamaha's corporate symbol is three overlapping tuning forks.

## TO GET IT DONE RIGHT . . .

Years ago it became clear to Yamaha's engineers and management team that if they were to maintain a position at the leading edge of technology it was necessary that they learn to "do it themselves." With today's semiconductor-based technology that meant the design and manufacturing of special custom semiconductors, IC's, and LSI's. Today, as the company nears its 100th anniversary, Yamaha's approach to the design and manufacture of both the LSI circuit "chips" and the products that use them has been remarkably successful. Yamaha's

ability to design and manufacture sophisticated solid-state devices is so widely recognized that they now serve as a major supplier of parts and finished goods to a wide variety of other companies. Not only are some 300,000 LSI's a month shipped to other manufacturers, but the CD players found in the product lines of some of the best known audio companies were built for them by Yamaha.

Yamaha has been taking full advantage of the cost-effective quality made possible by their proprietary LSI (Large Scale Integrated) technology. With an annual production of twenty million units in two hundred varieties, Yamaha is in an excellent position to produce specialized devices for particular products. Although Yamaha components have never been designed (or priced) for the low-end mass market, Yamaha's advanced technology has substantially improved their cost/performance ratio. For example, only a few years ago, thanks to LSI technology, Yamaha brought to market a CD player that was a low-priced/high-performance breakthrough. By 1984, despite the intense competition, Yamaha's combi-

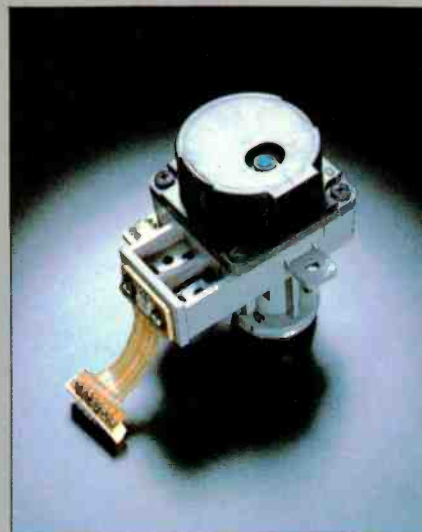


*Cartridge-handling mechanism  
Yamaha's YCD-1000 car CD player*

nation of price and performance had captured a 25 percent share of the CD player market.

## THE VIDEO CONNECTION

In a sense, Yamaha is using its audio success to underwrite expansion into



*Yamaha's proprietary-design video disc laser head*

the video area. As with the audio products, the video components will focus on fidelity (sound and picture) as a major prerequisite. Along with Hi-Fi VCR's and 26-inch video monitor/receivers, Yamaha produces over 15,000 laser disc players a month, more than half of which have digital sound capability. The extended performance capabilities (and low cost) of the disc players are made possible by Yamaha designed and manufactured laser pickups and by VLSI (Very Large Scale Integrated) chips. (The VLSI's are one of the fruits of a \$20 million investment in R&D.) Complementing the high-fidelity video components is Yamaha's expanding line of audio/video amplification equipment designed to facilitate the interfacing of the two media.

From a modest start as a reed organ manufacturer in 1887, Yamaha's line of musical products grew slowly through the years. A successful sideroad was taken with motorcycle manufacturing in 1955 with no apparent damage to the company's musical reputation. And today the Yamaha brand name is also seen on all manner of quality sports equipment. But the primary concern of the company continues to be the performance and accurate reproduction of music. That was true for their last hundred years, and Yamaha expects it to continue to be true for at least the next hundred.

Yamaha  
 is introducing  
 an audio/video  
 control amp,  
 a rear-channel  
 stereo power amp,  
 a video enhancer,  
 a multi-mode  
 surround sound  
 amp,  
 and an interactive  
 audio/video system  
 remote controller.

This is it.

It's called the AVC-50. You can use it to control just about everything in your audio/video system. It has a total of four video and six audio inputs. And the included remote can be used to control other Yamaha interactive audio components. So you can turn on your entire system, select audio and video source, control volume and playback of tuner, turntable, cassette deck, even a CD player.

The AVC-50 is also a full-featured integrated amplifier with 45 watts of power per channel. That's enough power to use it as the primary source of amplification in your A/V system. Or as a supplement to your present source of amplification, you can use it to drive a pair of rear channel speakers. Either way, the AVC-50 can decode the Dolby<sup>®</sup> Surround signals. And when used with a rear speaker setup, you'll enjoy the full surround sound effect of movies that are encoded with this special sound-track feature.

But many stereo movies don't have surround sound. Which is why the AVC-50 has a special feature called the Yamaha Natural Surround mode. This unique circuit creates the same thrilling effect by feeding the appropriate background and ambient sounds through the rear speakers.

The AVC-50 can even simulate stereo and surround sound from a mono source. And since most network and cable TV programs as well as many movies on cassette are mono, you should get a lot of use out of this feature.

You should also appreciate the video enhancement features built into the AVC-50. Three front panel controls give you continuously variable control over picture detail, sharpness and video level. Meaning you can not only improve the quality of the video signal during the recording process, but you can also improve the picture quality during playback.

There is one thing the AVC-50 can't do, however, and that is usher you to your seat. But once you are seated, with one of these at your command, you may never have to get up again. Or want to.



\*45 watts RMS per channel both channels drives into 8 ohms from 20-20,000 Hz, & no more than 0.05% Total Harmonic Distortion.

\*\*Dolby is a trade mark of Dolby Labs, Inc.

Yamaha Electronics Corporation, USA,  
 P.O. Box 6660, Buena Park, CA 90622

CIRCLE NO. 14 ON READER SERVICE CARD

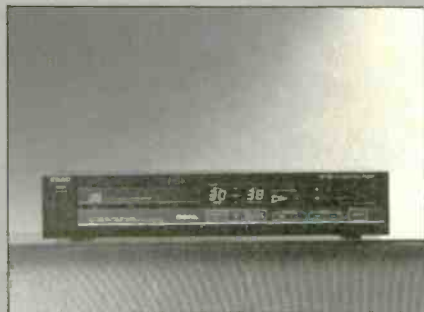




# TEAC: A COMMITMENT TO EXCELLENCE IN TECHNOLOGY

Today's hi-fi customer is more than a passive consumer. In a high-tech world, the savvy individual has learned to differentiate between claims and reality, having been trained to disbelieve the promises of fancy brochures and ads. Confronted with an avalanche of new products every year for many years, we are accustomed to filtering out exaggerated benefits and unnecessary features. Price competition in a mature marketplace has produced excellent activity in the "low-end" retail stores; however, manufacturers, in their zeal to fill the stores with cheap product, have neglected to maintain quality.

Throughout this five to ten-year period of declining price and quality, TEAC has strived to offer the same consistent level of excellence for which TEAC has long been known. We have continued using expensive electronics and assembly techniques while many others have not. We continue to apply sophisticated quality assurance testing to every unit while others have become satisfied with their increase in component failures out-of-the-box. Our engineers are still



*The PD-100 CD Player for the audiophile on a budget.*

encouraged to use quality of performance and longevity of useful life as criteria of design in the face of considerable market pressure to the contrary, because we have always known that eventually, the public would become disenchanted with the low standards purchased at low prices.

With the 1987 line of TEAC recorders and players, we reaffirm our position as the leading exponent of excel-

lent listening. Our line of CD players starts with the PD-100, a super sounding unit for the audiophile on a budget, and ends with the ZD-5000, by all accounts one of the finest CD players money can buy.



*The ZD-5000 delivers the full capability of compact disc technology.*

With a long history of superiority in tape recording, it is natural to expect TEAC's newest cassette recorders to exemplify our commitment to the listener. The V-770 (With Dolby B, C, and with HX Pro) is sure to please the most jaded music lover with its sound quality, and is chock full of those features which we have found make life easier for the non-technical. But we have gone one better: the AD-7 is one of our new combination CD Player/Cassette Decks intended to satisfy the need for both formats in those customers who value flexibility in a limited space, and who can benefit from the cost savings inherent in the units' design.



*The V-770, beautiful cassette sound from a rugged recorder.*

Video has by some measures overtaken audio in the marketplace as a fast-moving, vibrant field. Competition among manufacturers is enormous and generally emphasizes low price at the expense of high performance. This again is an area in which TEAC's expertise allows us to offer an alternative to low quality. TEAC has been in the high-end video business since 1964, when we developed and manufactured the very first slow motion videotape recorders used in Japan for broadcasting the 18th Summer Olympic Games from Tokyo. Our newest line of consumer VCR's has been selected to compliment our high end audio image, and contain popular features such as hi-fi stereo with HQ so that they will give their owners many years of viewing satisfaction.

TEAC's position as a high-end manufacturer means you can't always easily locate our products in every stereo store on the street. But the satisfaction of knowing you've purchased the best is enough to warrant the extra searching... and chances are that if you've found TEAC products, you've also located a dealer worth dealing with—one who is concerned with more than hustling the most cheap products he can.

## TEAC

# Teac Compact Disc. HiFi in the extreme.

Teac is not in the habit of building audio equipment for the undiscerning. Rather, we commit ourselves to those few individuals discontented with anything less than the finest recording and sound reproduction equipment money can buy.

Before you stands the remarkable Teac ZD-5000. Perhaps the purest embodiment the compact disc player has yet experienced. A machine with a list of features and specifications so numerous, so advanced as to impress the most jaded audiophile. A machine so refined its output jacks are plated with 24k gold. And when it comes to remote controlled functions, nobody comes remotely close.

The Teac ZD-5000 compact disc player. "Fi" just doesn't get any higher.





**HITACHI**  
...invites you to...

**Step  
Up to  
Tomorrow**

Hitachi goes a step beyond  
to bring you video a world apart.



**NEW SIZE, NEW LOOK**  
The 22" square tube. The very latest in picture tube technology. Twenty-eight percent more picture than 19" sets; full function remote; famous 10/2/1 limited warranty. A complete nerve center that integrates both video and audio sources. Only from Hitachi.

**Introducing HITACHI'S  
NEW CAM-N-CORD**

Another Hitachi breakthrough. The new Cam-N-Cord, color camera and VHS recorder, all in one mini hand-held unit. The ultimate in portable video electronics. 160 minute record/play time, 300 line resolution, 7 LUX, records direct from A/V output on TV, no tuner needed.



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 **HITACHI**  
A World Leader in Technology

# A few words for those who haven't experienced Sony's new Compact Disc Player.

Listen to it.



CIRCLE NO. 62 ON READER SERVICE CARD



# ENJOY THE ULTIMATE SOUND QUALITY AND LISTENING PLEASURE

Stax electrostatic earspeakers are used by discerning audiophiles, professional musicians, and recording companies. On the subject of headphones music lovers and audio critics agree that Stax electrostatic earspeakers offer superior sound quality and listening pleasure than any other.

In "Stereo Review's" recent review of the Stax SR-Lambda Professional earspeaker system Julian Hirsch said "The SR-Lambda Pro is the best set of headphones (or "earspeakers," if you prefer) that I have ever used or even heard of."

Please audition the full line of Stax electrostatic earspeakers. We are convinced that you will find them to be the most rewarding personal listening devices available.



## STAX FULL LINE DISPLAY DEALER LIST

### Alabama

Audio, Birmingham  
Campbells Audio, Huntsville  
Stereo Components, Birmingham

### Arizona

Wilson Audio, Tucson

### California

Absolute Audio, Orange  
Amatron, Los Angeles  
Audible Difference, Palo Alto  
Audio Service Center, Los Angeles  
Audio Today, Westminster  
Audio Vision, Santa Barbara  
Beverly Stereo, Los Angeles  
Century Stereo, San Jose  
Christopher Hansen, Ltd., Los Angeles  
DB Audio, Berkeley  
Dimensions In Stereo, Torrance  
Gene Rubin Audio, Monterey Park  
Genesis Audio, El Toro  
GNP, Pasadena  
Havens and Hardesty, Huntington Beach  
House of Music, San Francisco  
Jonas Miller Sound, Santa Monica  
Monterey Stereo, Monterey  
Music by the Sea, Leucadia  
Newport Audio, Newport Beach  
Paris Audio, Los Angeles, Torrance  
Sounding Board, Berkeley  
Sound Center, Woodland Hills  
Stereo Plus, San Francisco  
Stereo Showcase, Vallejo, Sacramento  
Stereo Unlimited, San Diego  
Systems Design Group, Redondo Beach, Sherman Oaks  
Western Audio, Palo Alto

### Colorado

Listen Up, Denver  
Audio Alternatives, Ft. Collins

### Connecticut

Kooper Products, Danbury  
Take 5 Audio, New Haven

### Florida

Audio by Caruso, Miami

Audio Insight, Ft. Lauderdale  
Sound Components, Ft. Lauderdale, Miami

### Georgia

Hi Fi Buys, Atlanta

### Illinois

Paul Heath Audio, Chicago  
Stereo Studio, Schaumburg  
Victor's Stereo, Chicago  
Media Room, Morton Grove

### Louisiana

Wilson Audio, New Orleans

### Maryland

Gramophone, Lutherville

### Massachusetts

Audio Studio Lab, Brookline  
Audio Vision, Lexington  
Goodwins, Cambridge  
Q Audio

### Michigan

Listening Room, Saginaw

### Minnesota

Audio Perfection, Minneapolis

### Mississippi

Sound Advice, Gulf Port

### Missouri

Best Sound, St. Louis  
Music Systems, St. Louis  
The Sound Room, Creve Couer

### Nevada

Audio Authority, Reno

### New Jersey

Atlantic Stereo, E. Brunswick  
CSA Audio, Upper Montclair  
Franklin Lakes Stereo, Franklin Lakes  
Pro Audio Consultants, Millburn,  
Stuart's Audio, Westfield, Englewood  
Woodbridge Stereo, Woodbridge  
Harvey Electronics, Paramus

### New Mexico

Sound Ideas, Albuquerque  
Real Time Audio, Albuquerque

### New York

Audio Breakthroughs, Manhasset, Manhattan

Audio Den, Lake Grove  
Ear Drum, Manuet  
Ears Nova, Great Neck  
Gala Sound, Rochester  
Grand Central Radio, NYC  
Harvey Electronics, NYC, White Plains  
Innovative Audio, Brooklyn  
Leonard Radio, NYC, Woodside  
Sound by Singer, NYC  
Sound Stage Audio Fresh Meadows, Woodside  
Park Avenue Audio, NYC  
Stereo Exchange, NYC  
Home Style Appliance/Sound Concepts, Mount Kisco

### N. Carolina

Audio Salon, Charlotte

### Ohio

Custom Electronics, Columbus  
Hoffmans House of Stereo, Brookpark, Wickliffe

### Oklahoma

Contemporary Sound, Oklahoma City

### Oregon

Hawthorne Stereo  
Audio Unlimited, Lagrande

### Pennsylvania

Sassafras Audio, Jenkintown  
Soundex of Willow Grove, Willow Grove

### S. Carolina

Wise Audio, Greenville

### Tennessee

Underground Sound, Memphis  
College Hi Fi, Chattanooga

### Texas

Audio Prophiles, Houston  
Dallas Audio Concepts, Dallas  
Hillcrest Hi Fi, Dallas  
Houston Audio Concepts, Houston

### Virginia

High C Stereo, Leesburg

### Washington

Definitive Audio, Seattle

### Wisconsin

Flanner & Hafsoos, Milwaukee  
Happy Medium, Madison  
Hi Fi Heaven, Greenbay

For a full STAX brochure send \$3.00 to STAX Kogyo, Inc., 940 East Dominguez St., Carson, CA 90746

# A few words for those who have.

INTRODUCING THE THIRD GENERATION CD PLAYER THAT'S LIGHT YEARS AHEAD OF THE COMPETITION.

After listening to one of Sony's new third generation component CD players, you begin to realize you're hearing something not possible in any first, or even second generation player.

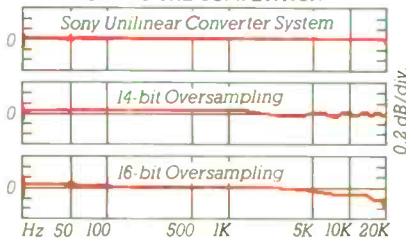
It's a whole new level of technological achievement not merely designed for those who appreciate great specs, but those who appreciate great music, as well.

A RESPONSE CURVE THAT ISN'T A CURVE.

All CD players are endowed with a much flatter response curve than any turntable or tape deck is capable of reproducing. Unfortunately, most are also endowed with a conventional converter/filter system. Which tends to cause high frequency irregularities.

However, take the response curve of Sony's new CDP-302 II (the one that's flat as a board).

FREQUENCY RESPONSE: SONY VS. THE COMPETITION



As you can see, it's far more uniform than the one found in conventional models. What this should tell you is that when you listen to even the most intricate piece of music, you'll be hearing precisely what the musicians recorded. Nothing more. And nothing less.

YOU CAN'T BEAT OUR CLOCK.

Perhaps the most interesting "little" feat of engineering is Sony's new Unilinear Converter System. Its high-speed, digital-to-analog converter works by virtue of a "master clock." Using this single clock dramatically

reduces intermodulation distortion common to "multiclock" converter systems.

When you combine all this with our new, high-resolution digital filter, it results in something even the most ardent audiophile will find no fault with: incredibly flat response, remarkable phase linearity and the conspicuous absence of spurious noise caused by conventional oversampling.

Of course, you'll need a master's degree in engineering to fully understand all the intricacies of our new Unilinear Converter. But you certainly don't need one to appreciate it.

A NEW CHIP OFF THE OLD BLOCK.

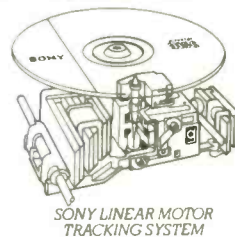
The heart of our new CD player is a thing of beauty. This award-winning microchip governs nine different functions usually requiring multiple chips in conventional players. But more importantly, it simplifies the signal path and improves reliability.

CHANGE TRACKS AT THE SPEED OF LIGHT.

Sony has done away with the lumbering gear-driven tracking mechanism, and instead, created the first Linear Motor Tracking System. It uses a compact laser optic assembly that's one-third the size of typical units. And its linear, noncogging motor allows the laser to move

faster and more precisely.

If you're wondering what speed has to do with these mechanisms, we'd like to remind you of the fact that it takes some CD players up to 15 seconds to go from the first to the last track on a disc. But with ours, you can go from track 1 to 99 in less than a second.



FEATURES WORTH HEARING MORE ABOUT.

Not all of these advances are audible to the naked ear.

Most of our new CD players come complete with Sony's Remote Commander™ unit which provides direct access to up to 99 tracks or subcoded selections. In addition, they have Automatic Music Sensor™ high-speed search and three-way repeat. (The CDP-302 II shown here also allows for programmability of up to 16 of your favorite songs.)

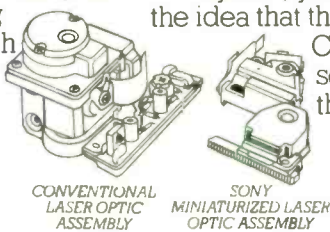
We'd also be remiss in not telling you about our built-in subcode port. Which in the not-too-distant future you can make good use of when CDs are integrated with graphic information.

By now, you're beginning to get the idea that the new line of Sony CD players not only sound remarkable, they are.

So having heard and read just about all there is to hear and read about

them, we suggest there's only one thing left to do. Go to your Sony hi-fi dealer and purchase one.

Of course, there's no rush. It will take our competition at least one or two generations to catch up.



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**SONY**  
THE LEADER  
IN DIGITAL AUDIO.™



# MAXELL: TAPE TECHNOLOGY FOR DIGITAL REPRODUCTION

Given the current digital revolution in music reproduction, the demands placed upon cassette tape performance have become particularly severe. Maxell has met the digital challenge with three new top-of-the-line cassettes—cassettes that incorporate significant breakthroughs in the art and science of magnetic particle technology.

## SUPER SMALL AND STABLE

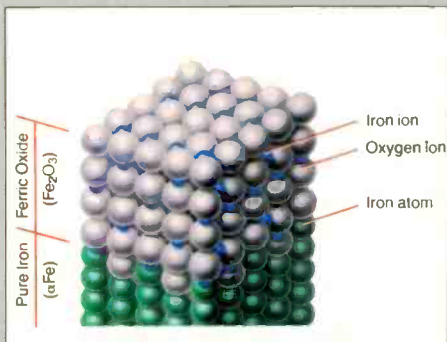
Maxell's SSP (Super Stabilized Pure) 0.3-micron metal particles achieve new levels of performance with their remarkably small size and excellent uniformity. Despite their minute dimensions, which result in extremely low noise, they are unaffected by oxidation that would, over time, degrade their superior characteristics. A unique Maxell process coats each pure iron particle with a protective iron-oxide layer only 30 angstroms thick. (An angstrom equals 1/10,000,000 mm.) This high-density oxide coating effectively prevents oxidation of the particle itself, while allowing full realization of its inherent performance quality.

## NEW XLII-S/XLI-S TECHNOLOGY

For recording tasks best served by high-bias and normal-bias tapes, Maxell provides, respectively, the XLII-S and XLI-S cassettes. Both tape types incorporate three significant technical advances: Super Fine epitaxial particles, FC coating technology, and HB binding treatment.

## SUPER FINE EPITAXIAL

Epitaxial refers to a sophisticated deposition technique that molecularly layers different substances to create a desired combination of properties. The new Super Fine (SF) particles combine the superior low- and mid-frequency energy of gamma ferric oxide with the unmatched high-frequency characteristics of cobalt ferrite. To ensure excellent noise levels, the SF particles have been reduced in size to an astonishing 0.23 microns. Particle uniformity is outstanding, thus permitting precise orientation in the magnetic coating and high packing density. For both the new XLII-S high-bias and XLI-S normal-bias tapes, this translates into lower noise and superior recorded signal storage throughout the audio band.

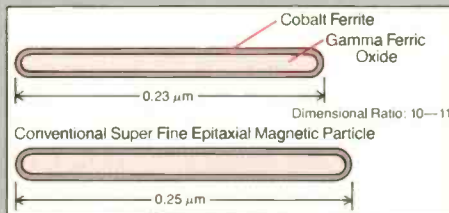


## NEW MX METAL TECHNOLOGY

Any tape is improved by reducing the size of its magnetic particles, the active ingredients in the tape coating. Smaller particles mean lower tape noise. But pure-metal tape has always had a special problem in this regard; the smaller the particle, the greater the tendency for the pure metal to suffer degrading oxidation. In addition, smaller particles are far more difficult to orient properly during the tape-coating process. Through unremitting research, Maxell has developed techniques for eliminating both of these problems, resulting in digital-quality tapes with extraordinary performance.

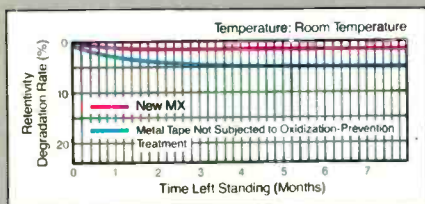
## THE TD TREATMENT

Precise particle orientation and high packing density are essential for achieving the full energy and low-noise potential of the SSP particle. The new Maxell TD technology precisely orients the magnetic particles lengthwise along the tape and packs the particles into the magnetic layer with exceptionally high density. This results in an ideally "square" hysteresis characteristic that indicates exceptional recording and playback properties. Further, the binder that "glues" the particles to the tape base film has been strengthened and, in addition, is formulated to provide ideal particle dispersion. Shedding, dropouts, and signal strength variations are totally eliminated.



## FINE CONCENTRATE COATING

The procedures that coat a dense, uniform, and smooth layer of magnetic material on the polyester base material are another critical part of tape manufacturing. The Fine Concentrate (FC) coating process is facilitated by the excellent physical properties of the SF particles. (Generally, as the size of a magnetic particle is reduced, the ratio of surface area to individual weight makes it difficult to achieve high packing density. FC coating is designed to circumvent such problems.) After coating, exceptional tape smoothness is achieved by a special surface treatment that ensures the intimate head/tape contact necessary for good high frequency response and absence of dropouts.



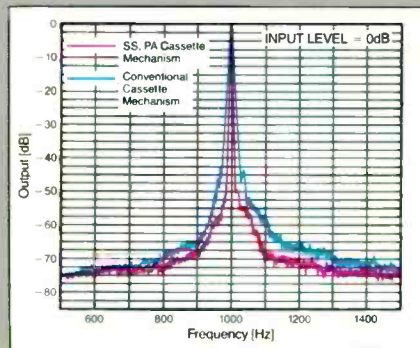
## HB TREATMENT

The Heavy Binding process developed by Maxell for their video tapes (which must contend with high-speed rotating record/play heads) has been applied to the new audio tapes. Instead of the tape coating merely being cemented to the tape's base film, HB establishes a molecular bond between the base and its coating that ensures stable, consistent performance through years of use.

## THE CASSETTE SHELL

It is not generally appreciated that the quality of the cassette shell mechanism that encloses the tape plays an important role—for better or worse—in determining a cassette's overall quality of performance. The development of the superior new MX and XL tapes motivated Maxell to further improve their already excellent shell design. Using the very latest moulding technologies and materials, the new SS-PA (Super Silent-Phase Accurate) shell has enhanced performance in numerous areas: mechanical operat-

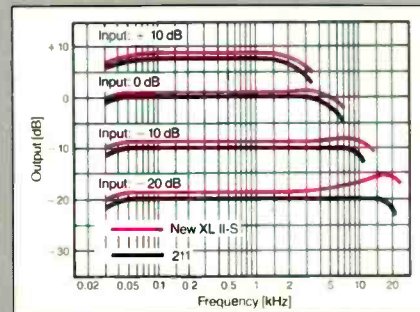
ing noise, phase accuracy, modulation noise, shell resonance, winding performance, and head contact.



## SILENT RUNNING

To be compatible with today's digital music sources, cassettes must have a mechanical noise level low enough to complement the electrical quietness of the tape. Toward that end, Maxell literally redesigned their shell inside and out. The shell halves are precision moulded from a special nonresonant material that damps both the shell's own internal vibration and that from the deck mechanism. The result is a 15 percent reduction in signal-dependent modulation noise.

New guide rollers, precision formed to a remarkably high degree of circularity and mounted with precise verticality, facilitates tape travel and further suppresses vibration in the tape path. Newly designed and precisely formed slip sheets are installed between the tape pack and the interior shell walls provide greatly reduced friction and vastly improved control over fast-wind performance.



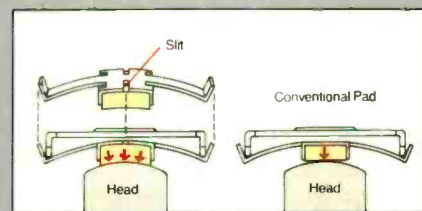
## ELECTRICAL EFFECTS

The shell mechanism has enormous influence on the audible performance of the tape it houses. For example, the

tape when running must maintain exact perpendicularity to the head gap or there will be audible signal losses, particularly in the high frequencies. And with even the slightest difference between the azimuth angle of the head and tape, there is a loss of sound image stability due to phase shift. Maxell's Phase Accuracy cassette design prevents tape skew inside the shell and succeeds in keeping phase deviation below 10 degrees, thus ensuring an excellent phase characteristic.

## THE PRESSURE PAD

Every cassette has a built-in pressure pad mechanism whose function it is to ensure firm, steady contact between the running tape and the recorder's head gaps. Any loss of pressure or separation between tape and head results in severe signal degradation. As part of their overall upgrading effort for their new MX and XL series of cassettes, Maxell completely redesigned the pressure pad assembly for greater reliability and better conformation to the tape head surface. The improved pad assembly facilitates tape flow while ensuring the maximum transfer of energy between tape and head gap.



We've touched upon only the high points of Maxell's impressive new generation of cassette tapes designed specifically to capture the quality of today's digital music sources. For further information, write to us at the address below. Or better yet, hear Maxell's superior cassette sound for yourself by picking up a sample assortment at your local Maxell dealer.

**maxell**

The perfect response to digital technology.



# MADE IN THE U.S.A.

*Japanese audio/video factories from coast to coast*

*By William Burton*



WHEN Japanese institutions invest abroad they tend to buy stocks and bonds rather than factories. According to an estimate published in the *New York Times*, Japanese investors bought one-quarter of the bonds issued last year by the United States Treasury. Nevertheless, there are many Japanese factories in the United States. The things they make vary widely, from automobiles down to the chopsticks produced by a factory in Bob Dylan's hometown, Hibbing, Minnesota.

Brand names such as Panasonic, Sony, and Yamaha appear on many products besides home hi-fi equipment. These may be musical instruments, professional recording equipment, telephones, typewriters, microwave ovens, vacuum cleaners, or electric fans. Some of them are made or assembled in factories in the United States. The ones indicated on the map, however, are only factories that produce Compact Discs, videodiscs, blank tape, and audio or video equipment (or parts). Some are in production now, others are expected to be on line soon.

The first Compact Disc pressing plant to open in the United States was the one owned by Sony in Terre Haute, Indiana. That plant produced its ten-millionth CD this spring. Denon plans to open one in March 1987 in Madison, Georgia, to produce a million CD's each month. JVC has a CD packaging facility in Los Angeles. La-

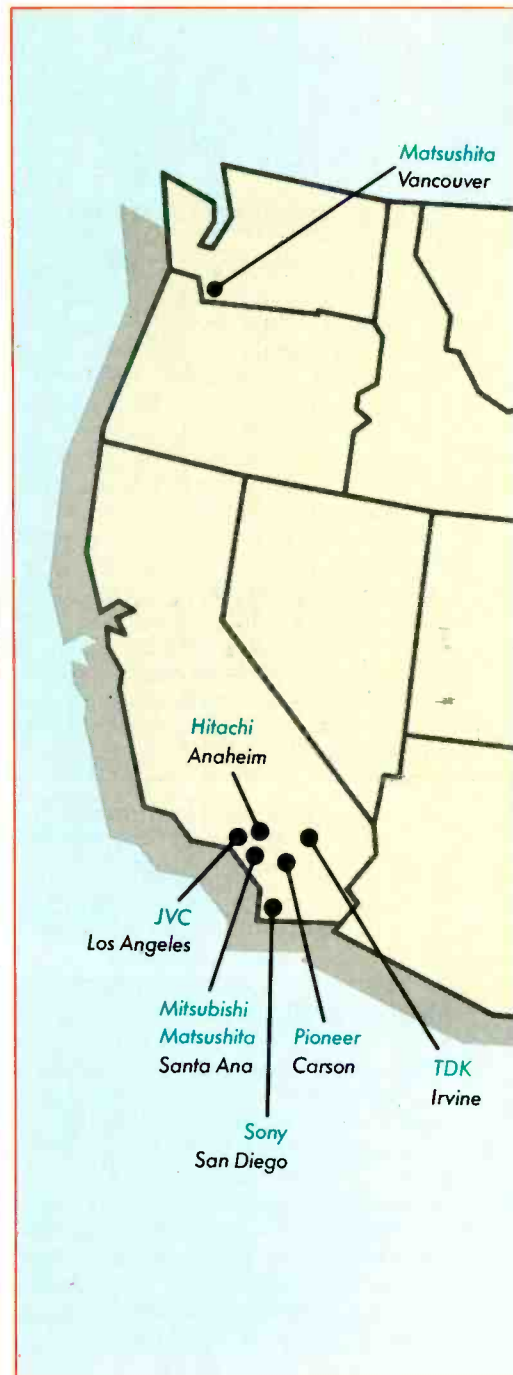
serDiscs are pressed by Pioneer in Carson, California.

Pioneer will be manufacturing car stereo components in a factory in Springboro, Ohio. Opening in September, it will employ 250 workers. Car stereo components will also be assembled by Clarion in Frankfort, Kentucky. Fujitsu Ten is said to be looking for a site for a factory where it can begin to make car stereo equipment in the United States next year.

To help satisfy the American appetite for video recorders, NEC plans to make them in Georgia. Matsushita, parent company of Panasonic, Technics, and Quasar, plans to build a video plant in Vancouver, Washington, that may be used for the production of VCR's. Hitachi is scheduled to begin assembling VCR's from imported parts at its factory in Anaheim, California, this year.

Sony built a television factory in San Diego, California, in 1972, which made it the first Japanese company to open a U.S. TV plant. Originally employing thirty-five, the factory now has over 1,700 workers. It recently produced its six-millionth color set. Televisions are also built by Toshiba in Lebanon, Tennessee, by NEC in Henry County, Georgia, by Hitachi in Anaheim, and by Sharp in Memphis, Tennessee. The Sharp factory produces 70,000 sets each month.

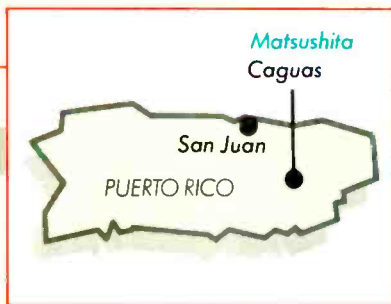
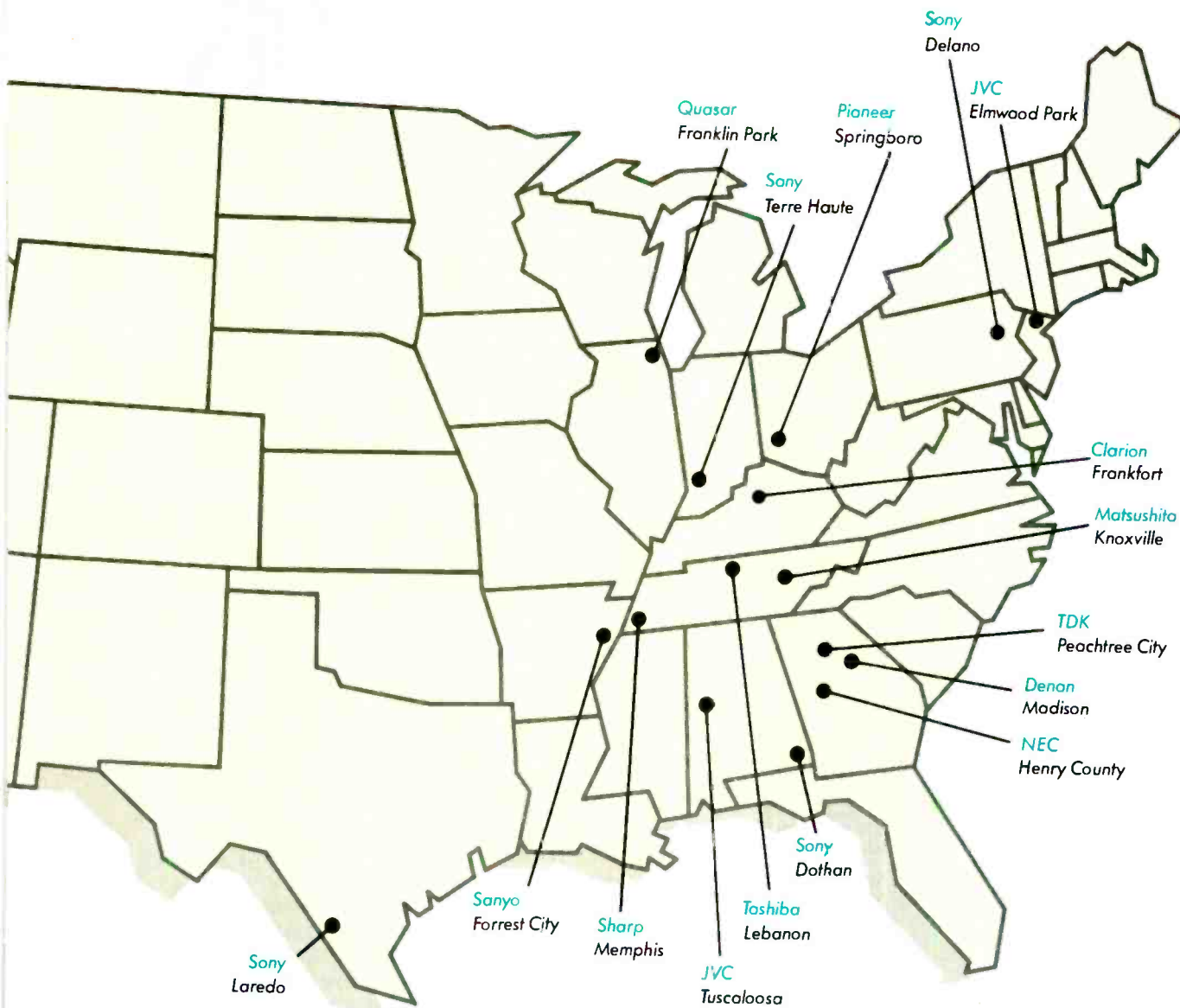
JVC has begun construction on a plant in Elmwood Park, New Jersey, that will produce 250,000 TV's each year. Quasar, a division of Matsushita Electric, builds TV's in Franklin Park, Illinois. Mitsubi-



shi assembles televisions in a plant in Santa Ana, California, as does Sanyo in Forrest City, Arkansas.

In Knoxville, Tennessee, a factory owned by Matsushita Electronic Components produces speakers, capacitors, and other electronic parts. Matsushita also makes speakers and turntables in Puerto Rico. Delano, Pennsylvania, is the site of a Sony speaker factory.

TDK is now making tape in factories in Irvine, California, and Peachtree City, Georgia. Sony



makes tape in Dothan, Alabama, and Laredo, Texas. A JVC plant is set to open in Tuscaloosa, Alabama, later this year.

The Japanese are not the only ones from the Far East to build factories here. The Korean-based GoldStar and Samsung companies have television factories here, GoldStar just outside Atlanta and Samsung in Dallas and in Roxbury, New Jersey. The Roxbury plant is currently popping 2,000 sets per day off two assembly lines, with a third soon to be added. □

*Japanese factories make CD's, videodiscs, blank tape, and audio and video equipment or parts.*



# SYSTEMS

Effective sound from all over

by William Burton

**T**HE Manhattan apartment of Robert Greenberg is a sophisticated environment that combines art and nature with high-tech design. To complement these elements Greenberg has carefully selected and installed a music system with remote speakers and remote control.

Greenberg—jointly with his brother Richard—heads R/Greenberg Associates, a production company that has done special effects for films ranging from *Alien* to *Zelig*. Since the firm is committed to leading-edge technology in film, it is not surprising that Greenberg's sound equipment, like everything else in his apartment, has the sleek look of well-designed precision instruments.

In choosing his audio equipment Greenberg has given preference to components from Nakamichi, so at first glance the installation may look like an all-Japanese system. In fact, however, like the systems of most American audiophiles, this one also incorporates technology and components from the United States and Europe. The result is a clean and spacious sound that can be as classical as the bust of Beethoven below the electronic components or as modern as the interactive sculptures, which vibrate after they are touched.

From the top of the recessed equipment rack to the bottom, Greenberg's wall of sound is mostly made of Nakamichi units: the PA-7 and PA-5 power amplifiers, two CA-5 control amps, an ST-7 tuner, an OMS-7 Compact Disc player, a Dragon cassette deck, and—beneath the Bozak 902A amplified time-delay unit and Mediacom CT 9000 remote-control system—a Nakamichi Dragon-CT turntable, with Denon's DL-302 moving-coil cartridge, on a slide-out tray.

The Nakamichi power amplifiers are noteworthy for their Stasis technology, which is licensed to Nakamichi by Threshold. Unlike most ordinary amplifiers, Stasis amps use no negative feedback. Perform-





ance is virtually independent of load, dynamics, and frequency. The PA-7, weighing 59½ pounds, is rated at 200 watts per channel, the 48½-pound PA-5 at 100 watts per channel.

Some LP's, CD's, and tapes are stored beneath the components (along with Beethoven). The remainder of Mr. Greenberg's music collection is stored in the adjoining dining room, which has its own Braun stereo system.

The main speaker system consists of Canton Ergo Passiv satellites (if such large, floor-standing speakers can properly be called "satellites") and Canton's Plus A powered subwoofer with a built-in crossover. Crossover frequency, bass level, and input sensitivity are switched on the subwoofer's upper front panel, with the settings displayed in LED numerals. The subwoofer contains amplifiers rated at 75 watts per channel rms for the satellites, and its own two

12½-inch drivers are powered by two bridged amplifiers that deliver a total of 160 watts rms.

The time-delay system feeds rear-channel signals to small ADS L300/Series II speakers mounted on the wall of the balcony opposite the main speakers. Additional remote speakers are located throughout the apartment. For more intimate listening, a pair of Yamaha YH-1 headphones can be borrowed from the phrenological head sculpture.

**E**XCLUDING the semi-pro Mediacom remote control, the total suggested retail price of the components adds up to \$15,460. The system was designed by Robert Bourdeau and was installed by Audio Video Systems Inc. The cabinetry is by David Nunez. □



# HOW TO BUY

## What are your options? Set your

**U**PGRADING your stereo system can be very exciting, and being armed with an education about the products you're out to purchase can only make the process easier and the results more satisfying. Today's receiver marketplace holds a multitude of high-quality products with a great range of features, so making the right choice is no longer as simple as it was in the past. But shopping for a receiver is certainly nothing to fear.

Any receiver is a complicated product—even the simplest ones include a stereo power amplifier, a control preamplifier, and an AM/FM tuner—and the complications increase as the manufacturers keep adding more functions. A top-of-the-line receiver today may include a graphic equalizer and an ambience enhancer, and it may perform just about as many video functions as audio ones, including switching and signal processing.

But if your prime concern is high-quality sound, you should direct your attention first to the receiver's basic amplifier, tuner, and preamplifier functions. Once you decide what you need in terms of the basics, you can consider what the various available extras will actually do to improve your system's performance or convenience.

### *The Amplifier Section*

The big variable here is the amount of power, and the power rating of a receiver's amplifier section is one of the biggest factors in determining its price. There's no way to give a simple recommendation on how much power you need: there are just too many variables. Most people find 40 to 60 watts per channel adequate, but having *more* power than you need is always better than having *less*. Insufficient power will not only affect the sound quality but can damage your speakers more easily than excess power. When an amplifier "clips" the signal at output levels greater than it was designed for, it generates high-energy, high-frequency harmonics that most tweeters cannot handle.

Here are some guidelines to remember:

- High-efficiency speakers need less power, low-efficiency speakers more power (check your speakers' *sensitivity* rating).
- Big rooms and multiple-speaker systems require more power, small rooms with a single pair of speakers need less power.
- The louder you like to play music, the more power you'll need for clean sound. If you listen only to low-level background music, don't waste your money on a lot of power—unless you have extremely inefficient speakers (again, check their sensitivity rating).

If you are trading up to a new receiver, remember that you have to *double* the power output to hear a just-noticeable 3-dB increase in volume. Thus, if you have a 40-watt receiver now, you would need at least an 80-watt model to notice any increase in volume. The same principle applies in comparing receivers; small differences in power ratings are insignificant.

Manufacturers often call a receiver (or other hi-fi product) "digital ready" to indicate that it can handle the short-term dynamic peaks found on some Compact Discs. A recording that requires an average power of 5 watts to reproduce it may include a cymbal crash that momentarily draws several hundred watts. The specification that indicates whether an amplifier can handle such peaks is its *dynamic headroom*, which is a measure of reserve power for transient peaks. An amplifier without adequate dynamic headroom will sometimes clip musical peaks even when it is operating at a moderate average level. A dynamic-headroom rating of 0.75 to 1.5 dB is okay; 1.75 to 2 dB is very good. Anything above 2 dB is excellent.

The *clipping headroom* is a less useful specification, more an indication of how conservatively an amplifier is rated than of how well it performs. It simply tells you how much continuous power above its rating an amplifier can deliver before it clips.

If you want to connect more than one pair of speakers to your receiver, look for models with *low-impedance drive capability*. The more speakers you connect, the lower the total impedance. If you connect, say, two pairs of 4-ohm speakers, the total impedance will be only 2 ohms, and many amplifiers react badly to a load impedance that low. Look for models rated to handle 2-ohm loads, or at least rated for more power into 4 ohms than into 8 ohms. Be wary of a receiver whose amplifier section doesn't have a 4-ohm rating.

**T**HE *total harmonic distortion* (THD) is a relatively unimportant specification these days. Hi-fi salespeople will refer to it during their pitch, however, so it should be understood. Harmonic distortion is the appearance of harmonics of the applied input signal at the output of an electronic component, in this case a receiver. Simply put, THD consists of unwanted additions to the program signal—in a word, noise. Though it is easy to measure THD and compare ratings, the THD of most receivers today is so low—below the threshold of human hearing—that it can generally be ignored.

More important is the rated *signal-to-noise ratio* (S/N), which tells you how low the noise level is relative to the musical program. The higher the S/N the better. Generally, CD, aux, and tape inputs have a higher S/N

# A RECEIVER

priorities. by Dawn Gordon



*Luxman's R-406 digital-synthesis AM/FM stereo receiver is rated for 60 watts per channel into 8 ohms, or 85 watts per channel peak power. It has a wireless remote control that can also control compatible Luxman components connected to the receiver. \$570.*

*For the audiophile with a limited budget, Rotel's \$199 RX-830 receiver offers 20 watts per channel continuous into 8 ohms. Its analog AM/FM tuner section is rated for a 65-db signal-to-noise ratio in stereo and 65-db alternate-channel selectivity.*



than the phono input. A good figure for the phono input is 75 to 80 dB; anything above 85 dB is great. The other inputs should have a rated S/N of at least 80 dB—some receivers are rated at 100 dB—on these “high-level” inputs.

The *frequency response* rating will indicate how accurately the receiver reproduces the tonal qualities of music. The “flatter” the response—the less variation across the audio spectrum—the better, because you want to hear the music, not the amplifier colorations. All receivers from reputable manufacturers have a frequency response that covers the full range of human hearing, from 20 to 20,000 Hz. The differences are in the amount of deviation within that range. A frequency-response rating that doesn't specify the deviation (as “ $\pm x$  dB”) is meaningless. A good receiver will vary no more than 1 dB from 20 to 20,000 Hz ( $\pm 0.5$  dB), and better ones vary  $\pm 0.25$  dB or less.

### The Tuner Section

Exceptional AM performance in a receiver is rare, and video tuning is an “extra.” What separates good receivers from excellent ones is their FM performance. Here's where you'll not only have to compare specs and features but also *listen*, since your location is a major factor in how well a given tuner will perform for you.

In general, if you live out in the country a tuner section's *sensitivity* is the most important spec, but if you live in the city *selectivity* is more important. If you live in the suburbs, both specs are important.

The *50-dB quieting sensitivity* is the significant rating if you live at a distance from the stations you want to hear. The lower the number the better. A figure of 16 dBf (or 3.5  $\mu$ V) for mono signals and 39 dBf (or 50  $\mu$ V) for stereo is adequate; a rating of 13 dBf (2.5  $\mu$ V) for mono and 33 dBf (12  $\mu$ V) for stereo is excellent. The *usable sensitivity* is not a very useful rating for comparing tuners.

If you live in an area with many different stations crowding the FM band, you should look at the *adjacent-channel selectivity*, which tells you how well the tuner distinguishes broadcast channels that lie next to each other. A 4-dB rating is average; 7 to 8 dB is excellent. *Alternate-channel selectivity* measures rejection of interference from stations two channels away from the one you tune in. A 60-dB rating is average, and 75 to 85 dB is considered excellent.

Good *image-rejection* specs are essential if you live near an airport since aircraft radio signals can be picked up by an FM tuner with poor image rejection. A decent spec is 71 dB, better figures are 80 to 90 dB, and exceptional tuners often have image-rejection ratings exceeding 100 dB.

*AM rejection* is another significant spec, since many engineers think it is a good indication of a tuner's ability to reject multipath interference. (It has nothing to do with the AM band, by the way, but is a measure of how well the tuner ignores irrelevant amplitude modulation of the FM signal.) Ratings for AM rejection in the range of 65 to 75 dB are quite good, and anything above 75 dB is excellent.

Stereo *channel separation* is important and often indicates how well the tuner is designed overall. The higher the number, the better. A rating of 35 dB is good, and 45 dB is very good.

A tuner section's *capture ratio* tells you how well it manages to reject an unwanted signal (such as from a

distant station) on the same channel as the one you want. A rating of 1.5 dB or less is excellent; above 2.5 dB is marginal performance.

The *signal-to-noise ratio* of the tuner section is also important. The stereo S/N rating should be at least 70 to 75 dB (with a 65-dBf signal), and a rating of 84 dB or more is excellent.

**B**YOND the specs, there are certain tuner-section *features* you should weigh. Most receivers today have digital-synthesis tuners with memories, which makes it possible to program various stations for pushbutton selection. How many presets you need depends on your listening tastes, and you can find receivers with anything from eight presets up to twenty-nine. If you have cable TV and the cable company is sending stereo TV sound on FM frequencies, you should select a receiver that has enough presets to accommodate your TV needs also.

### The Preamplifier Section

Receivers differ a great deal in their preamplifier sections, which can include a host of features beyond the basics. The best general advice is to buy a receiver that will let you expand your system with additional components. You may need only a phono input and one tape input-output loop to start with, but in the future you may want to add a second tape deck, a CD player, a signal processor, or one or more video sources. A single “auxiliary” input may not be enough for your needs.

External signal processors can usually be connected into a receiver's tape-monitor loop, but perhaps an even more convenient option is separate *preamplifier-out/main-amplifier-in jacks* joined by a jumper or a switch. Not many receivers have them, but one that does will let you connect, say, a surround-sound decoder and use the receiver's main volume control to adjust front and rear speakers equally at the same time.

*Dubbing and switching circuits* for both audio and video recorders can be very convenient if you make or duplicate your own tapes. Some setups even let you listen to one program while recording another.

*Tone controls* vary from simple bass and treble adjustments to built-in five-band graphic equalizers. Flexibility in this area is partly a matter of taste, although an equalizer can help make fine adjustments in the tonal quality of program material and tailor the sound to the acoustics of your listening room. With the more elaborate tone controls, look for a tone-control (or equalizer) *defeat* switch so you can easily restore flat response to check whether your adjustments are really helping.

*Loudness compensation* is a controversial area. Such a control can be helpful if you like to play music softly, but the effectiveness of the circuit designs varies. With any type of tone controls, experiment to hear whether the adjustments have the effects you want.

The latest trend is for *computer-controlled pushbuttons* for everything. Built-in microprocessors enable receivers to memorize various control settings for volume, balance, tone, loudness, input selection, and so on. Some models can store as many as ten different settings for different types of listening.

There are a few problems with all-pushbutton controls, however. Pushbuttons for volume, tone, and balance operate in discrete steps, so it may be hard to make minute adjustments the way you can with knobs or sliders. Many audiophiles cringe at the thought of volume



*Sansui's 80-watt S-XV1000 audio/video receiver can switch and process signals from three VCR's. It includes an audio fader, a sub-harmonic synthesizer, a joy stick for color balance, and a wireless remote. \$599.*



*The NAD 7130 digital-synthesis AM/FM receiver is rated for 30 watts per channel into 8 ohms—but with 3 dB dynamic headroom. It also features the NAD Soft Clipping circuit to reduce clipping distortion. \$378.*



*Denon's DRA-755 is a full-featured audio/video AM/FM receiver. It has video and audio inputs for a VCR and a videodisc player as well as audio inputs for a CD player, turntable, and two tape decks. \$550.*



*Solid is the word for the McIntosh MAC 4200, a 50-pound, 75-watt AM/FM receiver with a sophisticated analog tuner, a digital display, twelve presets, and five tone controls with center defeats. \$2,890.*





and tone pushbuttons because they feel these can affect sound quality. Again, try out the controls and see how you like their feel and effects.

### Other Options

A feature that's becoming common on receivers is a *stereo-synthesis* circuit to enhance mono sources, usually video. While manipulating a mono signal to create a variation between the two channels does work to some degree, it can never approach true stereo sound. So don't expect miracles.

A handful of audio receivers include tuning facilities for stereo TV sound, and you may find this feature useful if your TV set or VCR is not equipped to decode stereo broadcasts. If you plan to route mono TV sound through your stereo system, it's nice to have DNR (Dynamic Noise Reduction), which is found on some receivers, to clean up noisy signals.

Most receivers have one or more a.c. *convenience outlets* on the rear for connecting other components. Believe it or not, these really can be convenient; sometimes you can power your entire system from the receiver, eliminating a lot of power-cord tangle at the wall outlet. So the more convenience outlets the better, but be sure to check how much of a total load they can handle. A rating of 300 to 600 watts (which represents power *consumption*, not power output) is adequate for most purposes. To prevent damage from overloaded outlets, compute the total power consumption of all the units you intend to plug into the back of the receiver, and be sure that that number is lower than the total load rating of the convenience outlets.

Note that some convenience outlets are *switched*, others *unswitched*. A switched outlet is powered only when the receiver itself is turned on; an unswitched outlet is always on. Some components need standby

(Continued on page 123)

*Hitachi's HTA-55F has a 55-watt amplifier section, a five-band graphic equalizer, presets for ten AM and ten FM stations, and many other features. \$400.*



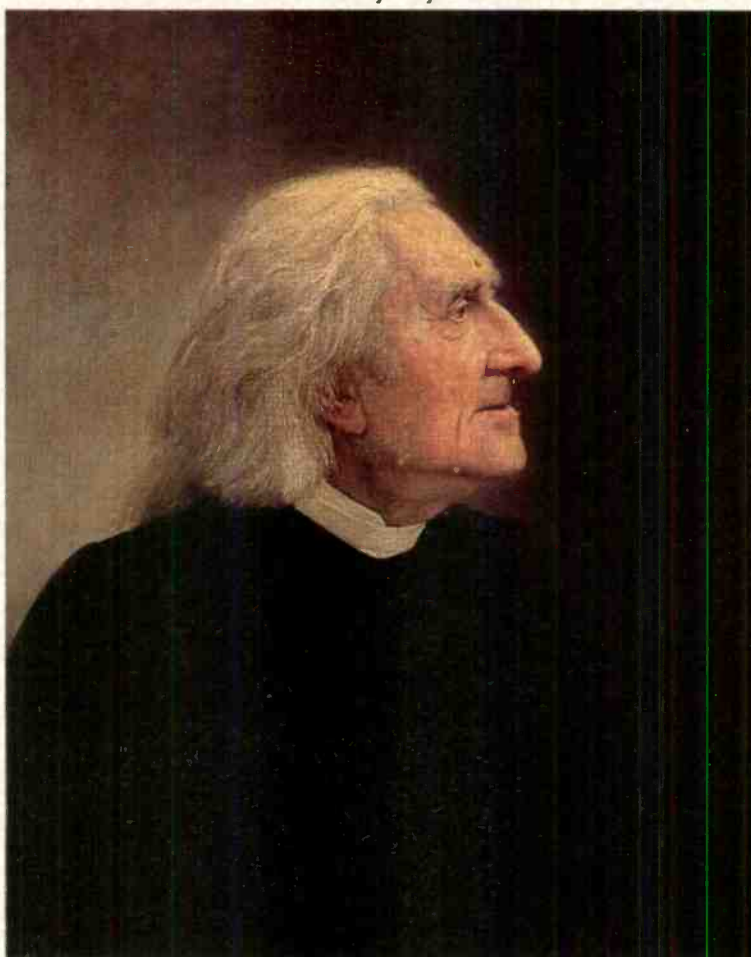
*The Carver 2000 receives stereo broadcasts on both the AM and FM bands. The receiver features Carver's proprietary Sonic Holography circuit, Asymmetric Charge-Coupled Detector for FM noise reduction, and Magnetic Field amplifier. The amplifier section is rated for 200 watts per channel. \$1,499.*



*Proton's D940 AM/FM receiver has a tuner section designed by Larry Schotz and a Dynamic Power on Demand amplifier section rated for 40 watts continuous or 160 watts dynamic power output into 8 ohms. Like the Carver 2000, it has inputs for moving-coil and moving-magnet cartridges. \$450.*

# LISZT ON RECORDS

A centennial survey by Richard Freed



Franz Liszt (October 22, 1811 - July 31, 1886)

**C**AMILLE SAINT-SAËNS once reported on a concert made up of "the orchestral works of Franz Liszt, whom the world calls a great pianist in order to avoid acknowledging him as one of the greatest composers of our time."

Even today, a hundred years after Liszt's death, that acknowledgement is hardly widespread. Old myths die hard, and the image of Liszt that has persisted in most people's minds is that of the barnstorming virtuoso, a musical stuntman who concocted display pieces for his own use but left little or nothing of "high artistic value" among his hundreds of compositions. There have always been musicians and scholars who knew better, but the public has cherished the old image and has

*Portrait of Franz Liszt by B. Tanig from the Curtis Institute of Music in Philadelphia. Photograph by Laird Bendrim/The Shooters, courtesy of London Records.*

been slow to come around to acknowledging Liszt's true stature as a creative genius and musical prophet.

Recent biographies make it clear that no man's life was ever in less need of fictionalizing to make it interesting, and in this centennial year musicological conferences and symposia have pointed up the profound influence of Liszt as creator, which has been felt throughout the last hundred years perhaps as strongly as in his own time. There are also, of course, more recordings than ever. Offered here is a brief list of "basic" works of Liszt on records, works chosen not because of their popularity but for being representative of this remarkable composer's innovative and stimulating contributions to several categories of music.

If you think you have to be a piano nut to be interested in Liszt, take another look at what Saint-Saëns said and remember that Liszt is generally credited with having "invented" the symphonic poem. There is a



## LISZT ON RECORDS

fine selection of some of his strongest pieces in this form—*Les Préludes*, *Orpheus*, *Tasso*, and *Ma-zepa*—played by the Leipzig Gewandhaus Orchestra under Kurt Masur, on a single economical LP in the Angel Master Series (AM-34745). Performances and sound quality are both splendid. Other performances of three of these four titles are available on Compact Disc but in nothing like so attractive a package as Masur's.

Regrettably, Angel has not made Masur's recording of *A Faust Symphony*, Liszt's most ambitious work for orchestra, available in the United States, but we do have an outstanding one by the late János Ferencsik, with the Hungarian State Orchestra, the tenor György Korondy, and the Hungarian Army Chorus. The appropriate filler in this two-disc Hungaroton set

(SLPX-12022/23) is Liszt's music for a different poetic treatment of the same legend, *The Nocturnal Procession* and *Mephisto Waltz* that constitute his *Two Episodes from Lenau's "Faust."* James Conlon, conducting the Rotterdam Philharmonic Orchestra and the Slovak Philharmonic Chorus, with tenor John Aler, does almost as well and has the same filler on his Erato LP's and cassettes. Without the filler, Conlon's performance fits snugly on a single CD (ECD-88068), and it is in that format that I recommend it. However, if Angel were to put Riccardo Muti's *Faust Symphony* with the Philadelphia Orchestra, Gösta Winbergh, and the men of the Westminster Choir on a single CD, I'd prefer it to Conlon's.

The choral section at the end of *A Faust Symphony* is so brief that Liszt made it optional—though the

Symphony Orchestra and the Hungarian Radio Chorus conducted by György Lehel (Hungaroton SLPD-12148, or HCD-12148 on Compact Disc) is more richly recorded.

Liszt's more intimately scaled vocal works, his songs, are among the very least-known of all his compositions. Dietrich Fischer-Dieskau and Daniel Barenboim have recorded all of them in a four-disc set for DG (2740 254), and the Swedish mezzo-soprano Sylvia Lindenstrand, ably accompanied by János Sólyom, offers a good representative selection of nine songs on a single economical Turnabout LP (TV 34785).

Liszt is even less likely to be associated with the realm of chamber music than he is with that of song, but he did compose a number of highly individual works in this category. Five somber but fascinating late works are conveniently collected on a Philips disc (411 117-1). They are *La lugubre gondola* for cello and piano; *Élégie I* for cello, piano, harp, and harmonium; *Élégie II* and *La notte* for violin and piano; and the *Romance oubliée* for viola and piano, all in sympathetic performances by Reinbert de Leeuw (piano), Vera Beths (violin, viola), Anner Byjlsma (cello), Gerda Ockers (harp), and Bob Zimmerman (harmonium).

The big Piano Sonata in B Minor, the *Années de pèlerinage*, and the *Transcendental Etudes* would be my own first thoughts among Liszt's keyboard works, and Jorge Bolet or the younger American Lisztian Jerome Rose would be my first choice to play them—though Rose has yet to record the sonata and Bolet has yet to complete the *Années* for London/Decca. In the last few years there seem to have been more recordings of the sonata than even of Vivaldi's *Four Seasons*, and so many outstanding pianists have recorded it that it would be hard to go wrong. With the likes of Bolet, Claudio Arrau, Vladimir Horowitz, and Alfred Brendel represented, one might almost let the matter of coupling decide one's choice. Arrau, who studied with one of Liszt's own pupils, has made dozens of Liszt recordings for Philips, and all of them carry great authority and conviction. His seven-LP set (6768 355) is a very handy way to enjoy the *Transcendental Etudes*, a good deal

WILLIAM E. BROWN



*Pianist Jerome Rose is a young American specialist in Liszt's keyboard works. His recordings include a fine account of Liszt's cycle "Années de pèlerinage" and an impressive performance of the "Transcendental Etudes."*

work is far less striking without it. For an impressive example of his full-scale choral writing, try the *Hungarian Coronation Mass*, composed for the coronation of the Emperor Franz Josef I as King of Hungary in 1867. It is not as elaborate as some of his other works in this form, but its conciseness and individuality make it especially interesting. Of the two current recordings, both made in Budapest, Ferencsik's, taped in the Coronation Church itself (Deutsche Grammophon 2543 802), is slightly more persuasive musically. The one by the Budapest



## LISZT ON RECORDS

of material from the *Années*, the sonata, a number of Verdi paraphrases, and still more—but there may be equally appealing, or even more appealing, recordings of some of the individual works.

I like Cécile Ousset's performance of the sonata on Angel (DS-38259), and the *Grandes études de Paganini* on the other side make the disc indispensable, regardless of duplication. On CD, Brendel's recent remake of the sonata is enhanced by its own companion works, the two *St. Francis Legends* and the two solo versions of *La lugubre gondola* (Philips 410 040-2). Bolet's performance of the sonata may be the most winning: it comes with the *Liebestrümme*, the *Grand galop chromatique*, and the *Valse impromptu* on London (410 115-1, or on CD 410 115-2).

Of the *Années de pèlerinage*, Bolet's superb performance of the *Première Année: Suisse* is on a London CD (410 160-2), as is the *Deuxième Année: Italie* (410 161-2); his recording of the third "year" has yet to appear. Jerome Rose's fine account of the entire cycle is well recorded and economical on a set of three Vox LP's (SVBX-5454), and his similarly impressive and more vividly recorded *Transcendental Etudes* have just been issued in a two-LP Vox Cum Laude set (2D-VCL 9082) along with four waltzes—the *Valse oubliée* No. 1, *Valse impromptu*, *Valse mélancolique*, and *Grande valse di bravura*—on side four. Bolet's recording of the *Transcendental Etudes*, formerly on RCA, is on an Ensayo CD now (CD-3401), and Philips has put Arrau's performance on CD (416 458-2).

The fantasies, paraphrases, and "reminiscences" of music from operas by various composers constitute a sizable and unusually interesting segment of Liszt's catalog of works. The brilliant selection played by Bolet, formerly on RCA, is back now, on CD only, on Ensayo (ENY-CD-3406).

For the two piano concertos, Brendel's Philips recording, with Bernard Haitink conducting (6500 374), is still at the top of my list. I deplore the side-break in the First Concerto, but the record does include the *Totentanz*, arguably a stronger work than either of the concertos. This would make a well-filled CD, too. In the meantime,



*The Cuban-born U.S.-trained giant of the keyboard Jorge Bolet has recorded what may be the most winning performance of Liszt's great Sonata in B Minor.*

Sviatoslav Richter's formidable account of the concertos alone, with Kiril Kondrashin conducting, has been reissued on CD by Philips (412 006-2).

If you pass up the concertos played by Brendel, be sure you do not pass up Bolet's recent recording of the *Totentanz* packaged with the *Hungarian Fantasia* and the seldom-heard *Malédiction* for piano and strings—all with the London Symphony under Iván Fischer on a London LP (414 079-1) or CD (414 079-2). Jerome Rose, with the Philharmonic Hungarica under Richard Kapp, offers an intriguing assortment of piano-and-orchestra arrangements of music by other composers—Schubert's *Wanderer Fantasy*, Weber's *Polonaise brillante*, and the ingratiating *Fantasia* on Beethoven's *Ruins of Athens*—on a Turnabout LP (QTV 34708).

No Hungarian Rhapsodies? Well, there are lots of smaller pieces that are worth having but might not make this particular list. If you must have some of the Rhapsodies, I'd suggest Alfred Brendel's 1968 Vanguard LP, with Nos. 2, 3, 8, 13, 15 (the *Rakóczy March*), and 17, along with the *Csárdás obstiné* (VCS-10035). Brendel's annotation for the Vanguard album is a valuable essay on Liszt in general, and on the background of the rhapsodies in particular.

And if you'd like to read more than what is on record jackets, pick up some of the fascinating recent

biographies in circulation now. At the head of the list, surely, is Volume I of the projected three-volume *Franz Liszt* by Alan Walker. It carries the subtitle, *The Virtuoso Years, 1811-1847*, and is published by Knopf (which will eventually issue Volume II, *The Weimar Years*, and Volume III, *The Final Years*). Worthwhile, too, is Eleanor Perényi's single-volume *Liszt: The Artist as Romantic Hero*, published a dozen years ago by Atlantic-Little, Brown. Perényi is highly opinionated, and even a little truculent, perhaps, both in defending her hero and in her attitude toward his other biographers, but she makes a strong case for Liszt as artist and paints a very sympathetic human portrait. And for remarkable wealth of detail on a seldom-explored facet of Liszt's life, try *Liszt and His Country, 1869-1873* by Dezső Legány (English translation by Gyula Gul'yás, revised by Bertha Gaster), which is published by Corvina Kiadó, Budapest.

These writers' painstaking and illuminating clarifications must make us wonder why anyone would have bothered to invent stories about Liszt when the real story was so much more fascinating than any of the fictions about him. At the same time, their books make it clear that such fictions were inevitable. Liszt was indeed, as Walker puts it, "a natural phenomenon," and he passed into folklore before he was out of his teens. □



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When you are at rest, so is your heart. A low resting heart rate usually means you're in good condition. Have you checked yours?



When you exercise, you should reach your heart's target zone. But, have I reached my exercise target zone, or just had too much coffee?

# Heart Window

**Now you can exercise, rest, swim or go out to dinner wearing the latest in computer pulse takers on your wrist. Plus, it's a talented sports watch and a formal dress watch too.**

By Drew Kaplan

It's a fact. You can tell a lot about yourself from your heart rate. You can evaluate the condition you are in, how much stress you are under, and how hard you should be exercising.

Think about it. How fast does your heart beat when you climb a flight of stairs? And how long does it take for your heart rate to return to normal?

Well, if you're at all like me, you may be a little out of shape. While I'm only 37, several friends of my own age have recently had heart attacks. And frankly, I'm getting just a bit worried.

You see, I am getting past the point where I can simply say, "I'll get back into shape next year."

So, whether you're a long distance runner (this is the ultimate jogging companion), or just a few pounds overweight like I am, your heart rate will give you a picture of your heart and body's condition.

Now you can take your heart rate anytime, anywhere with the newest in sophisticated electronic pulse takers.

And best of all, this heart computer is contained in a beautiful 24 hour alarm, 24 hour chronograph, LCD watch, that you will be as proud to wear with a coat and tie as you are when you're running.



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Your heart, just like any other muscle in your body, requires exercise. Unfortunately, unlike your arms, you can't see your heart's condition just by looking.

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Simply subtract your age from 220 beats per minute. So, for me at 37, my maximum heart rate is (220-37) or 183.

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heart rate up to at least (183 X 60%) or 110 beats per minute, and no higher than (184 X 80%) or 146 beats per minute.

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Note: The Heart Window is designed to indicate your pulse rate and aid your exercise, not to make medical diagnoses. **BUT ISN'T EVERYONE DIFFERENT?**

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So the Heart Window is safe for the beginner or the athlete. And, you'll really see your improvement as you exercise.

But you don't have to exercise. Just wearing the Heart Window and using it at the office when you're under stress, after you've walked up some stairs or around the block, will make and keep you aware of your body's physical condition.

And look at this. Sit down at your desk and take your pulse. Then drink a couple of cups of coffee and take your pulse again. You'll see just what your morning 'pickup' actually picks up, and if, God forbid, you smoke, take your pulse before and after a cigarette. Wow!

## ALL ELECTRONIC

With Innovative's new Pulsemeter watch, you'll have supreme accuracy. It's like a direct electronic line to your heart.

You see, unlike other pulseimeters that use a light shining through your finger, or a microphone to take your pulse, this instrument actually measures the electrical impulses that cause your heart to beat.

The back of the watch is one receptor, and the metal touch sensor on the front of the watch acts as the other sensor. Just touch the sensor, and you'll see your pulse on the large LCD Display.

**IS IT A DRESS OR SPORTS WATCH?** Innovative Time thinks that everyone interested in their pulse must be a pro-

fessional athlete. So, they've built this watch with all the athletic extras.

It's not only water resistant, it's guaranteed to 60 feet (although you can't actually take your pulse underwater). It has a stopwatch, a lap timer, and dual finish mode. Its band is made of very tough polymers. So, it's a sports watch.

But wait, I don't like black watches for dress. So, I've gotten Innovative to add a deluxe matching stainless bracelet to the watch. It's rendered in stainless and black and is a perfect high fashion choice. So, it's a dress watch.

Plus, there's a 24 hour alarm and an hourly chirp. The stainless band is great for sports or dress. So, you'll get the watch with the black band on it and the high fashion band packed with it, compliments of Innovative Time's superb engineering and DAK's good taste.

The Heart Window is backed by Innovative Time's 1 year limited warranty and comes with a 1 year battery in place.

## TRY THE HEART WINDOW RISK FREE

Now you can look at your heart as easily as the time. You'll see how you react to stress, foods and exercise. Don't let DAK's low price confuse you. Take this pulse watch to your own doctor and have him test it.

Try the Heart Window risk free. Try exercising and then check your cardiac recovery rate. If you don't like what you see, you'd better keep the watch. But if you just don't like the pulse watch, simply return it within 30 days in its original box for a courteous refund.

To order your Heart Window, Pulse Sports/Fashion Watch, complete with 2 bands risk free with your credit card, call toll free or send your check for just \$49.50 plus \$3 for postage and handling to DAK. Order No. 9844. CA res add sales tax.

In the gym, at the track or at the office, you'll have a direct connection to the condition of your heart.



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## BEST OF THE MONTH

*Stereo Review's critics choose the outstanding current releases*

### REBA MCENTIRE: COUNTRY'S WOMAN OF THE YEAR

**I**N her new album, "Whoever's in New England," Reba McEntire revives the "woman-to-woman" song genre that Kitty Wells established and Tammy Wynette made so famous in the late Sixties—a woman singing from a woman's point of view to other women, usually about the men in their lives. Often McEntire appears to be singing the song directly to her man, as in the title song, about a husband who has an extra dalliance on his business trips to Boston. But she's really singing the song for another woman—a woman who can offer sympathy and, more important, who can identify with the situation.

Not all the songs in this album are downers. *Can't Stop Me Now* celebrates the euphoric stage of love, and *Little Rock*, which refers to a wedding ring and not a town, packs the raunchy rush of a good ol' gal about to cheat on her inattentive spouse.

But there aren't many women singers in country music today who can infuse a song with as much convincing heartache as McEntire. On *I've Seen Better Days*, for example, where her husband has gone and taken the kids, listen to the sheer grief in her voice when she says, "Oh, Lord, I miss 'em." And yes, there's a hint of Tammy Wynette in her tone. Except that Wynette never could have sold this song this well.

One of the great surprises about McEntire is that on first listening to one of her records, you miss about half of what she's doing because there's so much quality stuff happening. On this one, co-produced by Jimmy Bowen and McEntire herself, the tunes are meaty and honest-sounding, and the production is uncluttered yet sparkling, without



*McEntire: honest-sounding songs infused with heartache*

much of the formula picking that often comes out of Nashville. Then there's that strong Oklahoma accent of hers that momentarily distracts you from the business at hand. But about the third time around, it starts to hit you just how first-rate McEntire's approach is.

With "Whoever's in New England," her fourth album for MCA, it's certain that McEntire, the Country Music Association's Female Vocalist of the Year for two years running, has not only revived the woman-to-woman genre, but that she has confirmed her place alongside Wynette and Wells as one of the foremost woman singers in the history of country music. Don't miss her.

*Alanna Nash*

**REBA MCENTIRE: *Whoever's in New England*.** Reba McEntire (vocals); vocal and instrumental accompaniment. *Can't Stop Me Now; You Can Take the Wings off Me; Whoever's in New England; I'll Believe It When I Feel It; I've Seen Better Days; Little Rock; If You Only Knew; One Thin Dime; Don't Touch Me There; To Make That Same Mistake Again.* MCA MCA-5691 \$8.98. © MCAC-5691 \$8.98.

### BARENBOIM'S ELEGANT MOZART

**T**HE music of Mozart has figured prominently in Daniel Barenboim's discography from the beginning. But although Barenboim recorded some of the piano sonatas for Westmin-

ster back in the mid-Sixties, he has waited until now to give us a complete set. Renewing his ties with EMI, he recorded the sonatas in Paris between December 1984 and August 1985, and Angel has released them in two volumes of three discs each on LP as well as in one six-CD set.

Barenboim's elegant, deeply felt response to the music is generally more persuasive in the later sonatas than in the earlier ones. In part, this is because the mature sobriety of his approach, which enhances the substance of Sonata No. 17 (K. 576), and even No. 15 (K. 545), tends to work against the natural buoyancy of the youthful sonatas. "Work against" may be an overstatement, for the early pieces, too, reveal greater substance in Barenboim's hands than we usually find in them. An occasional choppiness or mincing quality in the phrasing suggests that he may have been attempting to approximate Mozart's instruments on his modern concert grand. In any event, there is none of this in the performances of the later works.

If the famous *Rondo alla turca* that ends No. 11 (K. 331) seems rather unsmiling—well, perhaps it's worth the effort to forget prior notions, or "tradition," and listen with something like the freshness and seriousness Barenboim brings to the music. The three sonatas in minor keys, all later works, are exceptionally compelling. The A Minor Sonata (No. 8, K. 310) exudes a stark grandeur and tightly controlled drama perhaps even beyond what Vladimir Ashkenazy and Alfred Bren-



# BEST OF THE MONTH

del have brought out in it. Unlike Brendel, Barenboim not only feels that the C Minor Fantasy (K. 475) and Sonata (K. 457) do belong together, but he plays them in sequence without a pause. He is generous with repeats, by the way, throughout the cycle.

In general, I find Barenboim's sobriety more convincing than the studied simplicity of Mitsuko Uchida's not-yet-completed Mozart cycle on Philips. Perhaps it is András Schiff, on London, who strikes the happiest balance between brightness and profundity, elegance and effervescence, but Barenboim has reached very deep inside these sonatas, and the artistic level is consistently high throughout the entire set. The sound is exceptionally realistic on LP (on which this review is based), with the emphasis more on warmth than brightness, and the DMM pressings are good enough to compete point-for-point with any Compact Disc. *Richard Freed*

**MOZART: Piano Sonatas (complete).** Daniel Barenboim (piano). ANGEL ● DSC-3987/3988 two sets of three discs \$35.98 each, © CDCF-47336 six CD's no list price.

## STAN RIDGWAY: BIZARRE BUT COMPELLING

**S**TAN RIDGWAY is equal parts Raymond Chandler and John Huston, Pete Seeger and Thomas Dolby. Cynical, hard-boiled, with an eye for the grisly details of life at the bottom of the social ladder, Ridgway's first full-length solo album (he was founder and lead vocalist of Wall of Voodoo, an L.A. post-punk band) is a small masterpiece of short-storytelling and a weird hybrid of electronic, ethnic, and country music.

In "The Big Heat" Ridgway covers a lot of the same territory that Tom Waits does—strippers, cab drivers, jilted lovers, fugitives, Vietnam War vets—but the songs are less narratives than impressions and snippets of conversation, and Ridgway is much less apt than Waits is to sentimentalize his sub-



PER B. ADOLPHSON/EMI MUSIC

*Barenboim: Mozart viewed with mature sobriety*

jects. In *Can't Stop the Show*, for instance, Ridgway sings, "Betsy's in her birthday suit, spinnin' her baton," then adds, almost as an aside, "She did it better last year, before her boy friend broke her arm."

Critics have pointed to Ridgway's almost cinematic songwriting technique. Nowhere is this more evident than in *Walkin' Home Alone*, which catalogs an incredible variety of small details—last Sunday's crumpled newspaper, a wad of gum, a skinny dog, a dead telephone, an itching arm cast—that add up to a pretty comprehensive picture of a guy on the way to rock bottom. Ridgway's characters include a derelict, a salesman, a taxi driver who unwittingly becomes the getaway man for a beautiful thief, and a soldier who's saved from a Viet Cong ambush by a ghostly marine—not

*Ridgway: cinematic songwriting*



FRANK DELIA/I.R.S.

unlike a wartime version of Red Sovine's country-western classic *Big Joe and the Phantom 209*.

Ridgway's music is even stranger than his characters, grafting Dust Bowl folk singing onto high-tech synthesizer rhythms. On the title track, snaking synthesized bass and jittery percussion dog Ridgway's somewhat spooked vocal. The song deals with a manhunt in some post-apocalyptic future, and Ridgway tosses in errant bits of violin and harmonica that stand out against the synthesized background like the musical equivalent of clues planted to throw the pursuers off track. *Pile Driver* features a Mariachi synth intro that slides into an updating of *John Henry* in which a crew of workmen try to shut off a giant pile driver to the accompaniment of some wickedly menacing fuzz guitar. On *Pick It Up*, synth and banjo march arm-in-arm in a lockstep beat while Ridgway sings of a particularly crazed philosophy of self-preservation. A bizarre collision of styles, but it works. And the way it works, together with the fascinating *dramatis personae*, makes "The Big Heat" one of the real finds of 1986. Pick it up. *Mark Peel*

**STAN RIDGWAY: *The Big Heat*.** Stan Ridgway (vocals, keyboards, banjo, harmonica, guitar); instrumental accompaniment. *The Big Heat: Pick It Up (And Put It in Your Pocket); Can't Stop the Show; Pile Driver; Walkin' Home Alone; Drive, She Said; Salesman; Twisted; Camouflage.* I.R.S. IRS 5637 \$8.98, © IRSC 5637 \$8.98.





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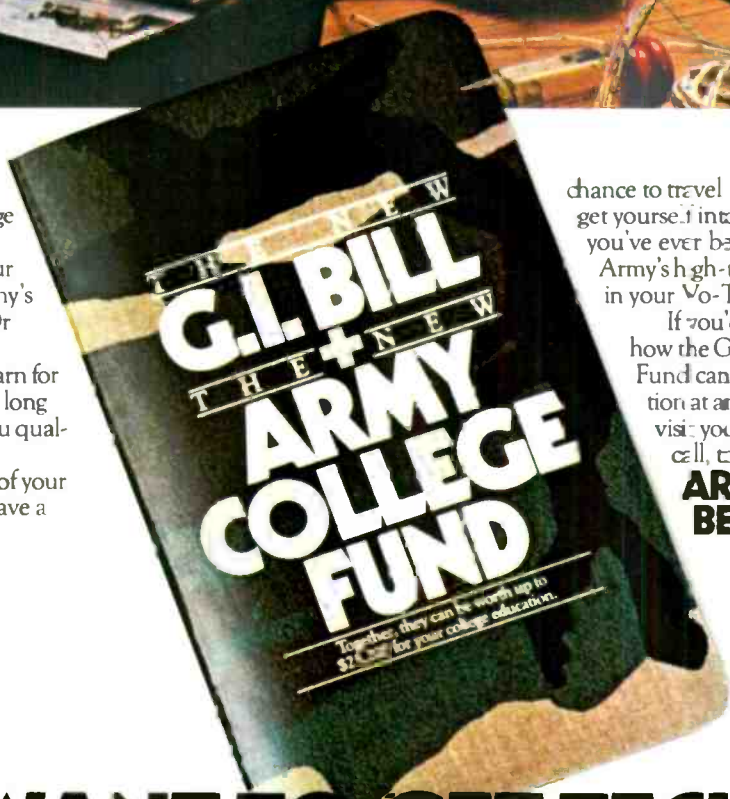
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**C**LAUDIO ABBADO'S first major recording project in his capacity as music director of the London Symphony Orchestra is a substantial Mendelssohn package for Deutsche Grammophon. It contains all five of the symphonies as well as three overtures, two of them well known (*The Hebrides* and *A Midsummer Night's Dream*) and the third less familiar (*The Fair Melusine*). The performances are very good indeed, and the sound is generally excellent.

The Symphony No. 1, from 1824, was Mendelssohn's first major work for full orchestra, following a dozen string symphonies he composed between 1821 and 1823 (they were published posthumously). It shows the influence of Weber in the end movements, and of Mozart's G Minor Symphony in the menuetto. For a London performance in 1829 Mendelssohn substituted for the menuetto an orchestral version of the scherzo from his 1825 Octet for Strings, and in the present recording this movement immediately follows the symphony. Both get neatly turned performances.

The so-called Symphony No. 2, or *Hymn of Praise*, for soloists, chorus, and orchestra, was more accurately described by Mendelssohn himself as a symphony-cantata. Composed in 1840 to honor the 400th anniversary of Gutenberg's invention of printing from movable type, it is properly ceremonious but contains passages of prime music. The basic idiom of the vocal movements, which constitute about two-thirds of the whole, has much in common with that of Mendelssohn's oratorio *Elijah*. In the hands of a conductor less skillful and sensitive than Abbado, it can become cloying or sanctimonious, but there are certainly no dead spots here.

The second work that Mendelssohn actually called a symphony was the *Reformation*, now called the Symphony No. 5 despite its early date of composition (1832). Abbado takes a fairly grave view of its open-

ing movement, to impressive effect, and the scherzo is sheer delight, with the London Symphony winds in peak form. The finale, based on the tune of *Ein feste Burg*, comes off brilliantly.

The dreamily romantic elements of the Third Symphony, the *Scottish*, loom large in Abbado's new reading, most impressively so in the slow movement. He captures nicely the windswept, outdoors feeling of the scherzo, and the finale has a properly martial urgency.

The *Italian* Symphony (No. 4) is played here with great elegance and attention to detail. The second-movement Pilgrims' Procession moves at a somewhat smarter pace than usual, and the *saltarello* movement goes at a tremendous clip, but the orchestra is with Abbado every bar of the way. Both the *Italian* and *Scottish* Symphonies are characterized by superb solo wind playing.

Abbado's readings of the much-recorded *Midsummer Night's Dream* and *Hebrides* Overtures are good though not outstanding (I prefer Karajan in *The Hebrides*, for example), and the overture to *The Fair Melusine* is a cut below its companions in musical interest. The recordings of the First Symphony and *The Hebrides* may have been miked differently from the rest; the sound is a bit dry. The *Hymn of Praise* and the *Scottish* and *Reformation* Symphonies, however, profit from a spacious acoustic surround. *David Hall*

**MENDELSSOHN: Symphonies Nos. 1-5. Overtures: A Midsummer Night's Dream; The Hebrides; The Fair Melusine.** London Symphony Chorus and Orchestra, Claudio Abbado cond. DEUTSCHE GRAMMOPHON 415 353-1 four discs \$39.92, ©415 353-4 three cassettes \$39.92, ©415 353-2 four CD's no list price.

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- **BERNSTEIN: *Symphonies Nos. 1 and 2*.** Bernstein. DG 415 964-2. "Startlingly inventive, virile works (November 1978).
- **ELGAR: *Cello Concerto*.** Du Pré, Barbirolli. *Sea Pictures*. Baker, Barbirolli. ANGEL CDC 47329 (new coupling for CD). Du Pré—"Eloquent" (May 1967); Baker—"Impeccable" (March 1972).
- **MAHLER: *Symphony No. 9*.** Haitink. PHILIPS 416 466-2. "Splendid" (Best of Month, July 1971).
- **PUCCINI: *Tosca*.** Price, Mehta. RCA RCD2-0105 (two CD's). "A tempestuous Tosca" (Best of Month, February 1974).

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Discs and tapes  
reviewed by  
Robert Ackart  
Richard Freed  
David Hall  
Stoddard Lincoln

**BACH** (arr. Dorsey): *Italian Concerto; Two- and Three-Part Inventions; Diverse Canons (BWV 1087); Toccata and Fugue in D Minor; Jesu, Joy of Man's Desiring*. Don Dorsey (synthesizers). TELARC ● DG-10123 \$12.98, © CS-123 \$12.98, © CD-80123 no list price.

Performance: *A travesty*  
Recording: *Fine*

Don Dorsey's synthesized performance of Bach's *Italian Concerto* has a basic sound very close to that of a bad harpsichord to which various extra sound effects are gradually introduced. After hearing his efforts, I had to wonder, "Why bother?" Although I have frequently said that Bach is indestructible, Dorsey's album, titled "Bachbusters," forces me to withdraw that statement. Dorsey has, indeed, managed to destroy Bach—or, more accurately, to undermine Bach's music with an all-encompassing vulgarity. That is, I suppose, an achievement of sorts. S.L.

**BACH: Concertos for Multiple Keyboards and Strings in A Minor (BWV 1065), C Major (BWV 1061), C Minor (BWV 1060), and D Minor (BWV 1063)**. Christoph Eschenbach, Justus Frantz, Gerhard Oppitz, Helmut Schmidt (piano); Hamburg Philharmonic, Christoph Eschenbach cond. DEUTSCHE GRAMMOPHON ● 415 655-1 \$10.98, © 415 655-4 \$10.98, © 415 655-2 no list price.

Performance: *Glittering*  
Recording: *Splendid*

Bach's concertos for two, three, or four keyboard instruments and string orchestra work splendidly played on modern pianos. In fact, in performances as sensitive as those here, the music sounds better than it does on harpsichords. Admittedly, two or more harpsichords playing together create a sort of intriguing jangle that can be pleasing to the ear, but on pianos one can do much more than jangle. The balances can be adjusted better, the variations in touch can be greater, and the opportunities for

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## HOROWITZ!

**V**LADIMIR HOROWITZ's first album for Deutsche Grammophon consists of performances recorded in his Manhattan apartment last year for a film called *Vladimir Horowitz—The Last Romantic*. The program, some sixty-five minutes of mostly brief pieces, is representative of the pianist's enthusiasms as well as illustrative of his style. Having noted that much, it would seem almost impertinent to comment further on the tasteful brilliance, the manifold subtleties, the incredible tone production, or any of the other elements that have contributed toward making that style into a mystique.

It need hardly be said that, no matter how many times Horowitz may have played or recorded this or that piece, its individual character shines here with the freshness of discovery—or rediscovery—and with the unselfconscious fastidiousness he has made spontaneity's handmaiden rather than its impediment. There is a fine balance of brightness and warmth in the vivid sound captured by John Pfeiffer, Horowitz's longtime producer at RCA, who served as audio producer for the film. Pfeiffer also gives some illuminating close-ups of Horowitz at eighty-one in his notes on the filming, which constitute the annotation for this release.

Richard Freed

**Vladimir Horowitz**. **Bach** (arr. Busoni): *Chorale-Prelude, Nun komm' der Heiden Heiland*. **Mozart**: *Piano Sonata in C Major (K. 330)*. **Chopin**: *Mazurka in A Minor, Op. 17, No. 4; Scherzo No. 1, in B Minor, Op. 20;*

dynamic expression add a new dimension. I am not belittling the usual settings of these works for harpsichords. I only wish to defend the performance of piano versions against those purists who insist on putting historical accuracy before musicality. S.L.

**BEETHOVEN: Symphonies Nos. 1-9. Overtures: Leonore No. 3; Fidelio; Coriolan; Egmont**. Anna Tomova-Sintova (soprano); Annelies Burmeister (contralto); Peter Schreier (tenor); Theo Adam (bass); Radio Chorus, Leipzig; Radio Chorus, Berlin; Dresden Philharmonic Children's Chorus; Gewandhaus Orchestra, Leipzig, Kurt Masur cond. PHILIPS ● 416 274-1 six discs \$59.88, © 416 274-4 six cassettes \$59.88, © 416 274-2 six CD's no list price.

Performance: *Good to excellent*  
Recording: *Very good*

These performances of the nine Beethoven symphonies and four of the



*Polonaise No. 6, in A-flat Major, Op. 53. Schubert: Impromptu in A-flat Major, Op. 90, No. 4. Liszt: Consolation No. 3, in D-flat Major. Schumann: Novellette in F Major, Op. 21, No. 1. Rachmaninoff: Prelude in G-sharp Minor, Op. 32, No. 12. Scriabin: Etude in C-sharp Minor, Op. 2, No. 1. Moszkowski: Etude in F Major, Op. 72, No. 6. Vladimir Horowitz (piano). DEUTSCHE GRAMMOPHON ● 419 045-1 \$10.98, © 419 045-4 \$10.98, © 419 045-2 no list price.*

HENRY JOHN CORRA/DC

overtures were recorded by Kurt Masur and the Leipzig Gewandhaus Orchestra on analog tape between 1972 and 1974. Digitally remastered, they are just now being released in the U.S., following recent digital cycles by three other East German conductors (Kurt Sanderling, Otmar Suitner, and Herbert Kegel). On CD, the sound is virtually indistinguishable from that of a digital original, except for a slight lack of tonal body in Symphonies Nos. 1 and 2 and an occasional blurring of transients at the low end of the spectrum. And in the Ninth Symphony the overall sonics and the choral-orchestral balance verge on the spectacular.

Masur's approach to Beethoven is in the classic, Central European tradition. His readings of the first two symphonies are refined almost to the point of being bland, but he hits his full stride in the *Eroica* with a massive opening movement, an eloquent funeral march, a finely honed scherzo, and a brilliant





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finale. That least appreciated of the nine, the Symphony No. 4, comes off even more effectively. There is a wonderful fullness and vigor in the fast movements and, for once, a slow movement with genuine line and tension.

The Fifth Symphony is granitic and majestic here, with a thrilling crescendo leading from the scherzo to the finale. The Sixth, the *Pastoral*, has the same warmth and largeness of spirit as the Fourth. The peasant dancers seem a bit on the beefy side, but they are convincing, and Masur brews up a splendid storm scene.

The introduction to Symphony No. 7 is a bit too brisk, and I don't find much urgency in the allegro, but everything is just fine thereafter, with the scherzo done brilliantly in a manner that recalls Toscanini. In No. 8, the easy gait of the "metronome" movement and the fairly quick pace of the *Tempo di menuetto* make for a welcome contrast.

Masur's version of the Ninth Symphony is a decidedly mixed bag. He takes the same granitic approach to the opening movement as he did in the *Eroica* and the Fifth Symphony, but I miss the urgency others have brought out in this music. The scherzo goes at a more moderate pace than usual, with a generous number of repeats, and the slow movement, at a very even tempo throughout, is convincingly eloquent.

I am less satisfied with the finale. The opening recitative by the double-bass seems tame, and when Theo Adam enters with its vocal counterpart, not only is his voice quality unlovely, but the "O Freunde" lacks the grace note that gives life to the whole phrase. The vocal soloists do well otherwise, and tenor Peter Schreier is particularly fine in the march passage. What is truly impressive about the finale in this performance, however, is the massive power of the well-trained choruses.

Although Masur recorded all of the Beethoven overtures along with the symphonies, the present release gives us only four, but they are well worth having. The *Leonore* No. 3 is tautly dramatic, and the *Fidelio* Overture has such verve and brilliance as to seem much more than a perfunctory curtain-raiser. The *Egmont* and *Coriolan* Overtures evoke memories of Wilhelm Mengelberg in his prime. As in the symphonies, the Gewandhaus Orchestra is splendidly alert and responsive to Masur's direction. Like most Austro-German orchestras with a long and illustrious tradition, they seem to have this music in their bones. *D.H.*

**BERNSTEIN: *Trouble in Tahiti.*** Beverly Wolff (mezzo-soprano), Dinah; David Atkinson (baritone), Sam; others. MGM Orchestra, Arthur Winograd cond. POLYDOR 827 845-1 \$9.98, 827 845-4 \$9.98.

Performance: *Good*

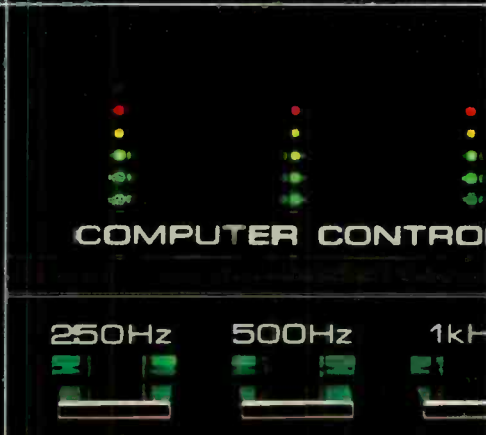
Recording: *Good remastering*

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been in the minority that puts it high on the list of Leonard Bernstein's creations. Generally, it has been dismissed as too pop-music oriented, and even Bernstein himself has called it "a lightweight piece [whose] roots are in musical comedy." But it still packs a tremendous wallop in its witty yet trenchant view of contemporary relationships, and I'm beginning to think that it has more to say musically to audiences today than Bernstein's more portentously serious *The Age of Anxiety* (Symphony No. 2) of two years earlier.

Ironically, this reissue of the opera's original recording from the mid-Fifties comes just two years after Bernstein sought to give it more theatrical and musical clout by teaming it with a newly composed sequel, *A Quiet Place*, in a production that got critically clobbered in both Texas and Milan. The truth is that *Trouble in Tahiti* holds up well enough on its own. So does this recording of it.

Frankly, this version is not as well sung as a 1974 Columbia recording (now deleted) with Nancy Williams and Julian Patrick, and with Bernstein himself conducting, but that version was so unevenly recorded that you can't understand the singers half the time. That's not a problem here. The balance between singers and orchestra is much better, even if the sound is drier and not as resonant overall. That balance is especially crucial for Beverly Wolff's show-stopping aria, from which the opera takes its title.

The Polydor reissue does not include the libretto, which did come with the original MGM release (and Columbia's), but that's not a critical omission in this case, thanks to the clarity of the singers' diction and the splendid digital remastering of the recording itself.

Roy Hemming

**CHOPIN:** *Four Mazurkas, Op. 6; Five Mazurkas, Op. 7; Waltz in E-flat Major, Op. 18; Waltz in A Minor, Op. 34, No. 2; Three Nocturnes, Op. 15; Nocturne in C-sharp Minor; Scherzo No. 1, in B Minor, Op. 20.* Vladimir Ashkenazy (piano). LONDON 411 896-1 \$10.98, © 411 896-4 \$10.98.

Performance: *Superb*  
Recording: *Exemplary*

This collection completes Vladimir Ashkenazy's fifteen-disc coverage of Chopin's works for solo piano. It is doubtful that a similar survey of any composer's total output has been brought off with so high a level of distinction, or such a consistent one. To be sure, Arthur Rubinstein's Chopin, which RCA is reissuing now on both LP and CD, remains treasurable, as does Claudio Arrau's, but performances on this level define their own terms and render comparisons rather pointless. Ashkenazy's final installment, made up of pieces from the years 1830-1832, is beautifully representative of the virtues, both musical and sonic, that have made the entire series the joy it is. R.F.



**KODÁLY: *Missa Brevis*.** VAUGHAN WILLIAMS: *Mass in G Minor*. New York Choral Society, Robert DeCormier dir.; Anthony Newman (organ). VOX CUM LAUDE 9076 \$7.98, © VCL 9076 \$7.98.

Performance: *Sincere, unaffected*  
Recording: *Well-balanced*

There is a no-nonsense quality about the New York Choral Society and its leader, Robert DeCormier, that I have long admired. They give careful attention to the music and turn in sensitive performances. The four different soloists in each work here are in good voice and sing well, but the chorus is the star of the recording. Its well-molded phrasing, fine control, and accurate intonation are the very qualities that make expert choral singing a joy to the ear. Special mention should also be made of Anthony Newman's masterly organ accompaniments. Highly recommended. *R.A.*

**LISZT: *Sonata in B Minor; Deux Légendes; Bénédiction de Dieu dans la solitude*.** François-René Duchable (piano). ERATO/RCA ◉ NUM 75177 \$10.98, © MCE 75177 \$10.98, © ECD 88091 no list price.

Performance: *Brilliant*  
Recording: *Close up*

Recordings of Liszt's big Sonata in B Minor, once considered something of an event, now seem to come at us with almost greater frequency than those of Vivaldi's *Four Seasons*. Some of the very recent ones have been especially worthwhile—particularly Jorge Bolet's on London and Cécile Ousset's on Angel. And Alfred Brendel's slightly earlier Philips release duplicates François-René Duchable's program here except that Brendel plays *La lugubre gondola* Nos. 1 and 2 instead of the *Bénédiction de Dieu dans la solitude* (No. 3 of the *Harmonies poétiques et religieuses*).

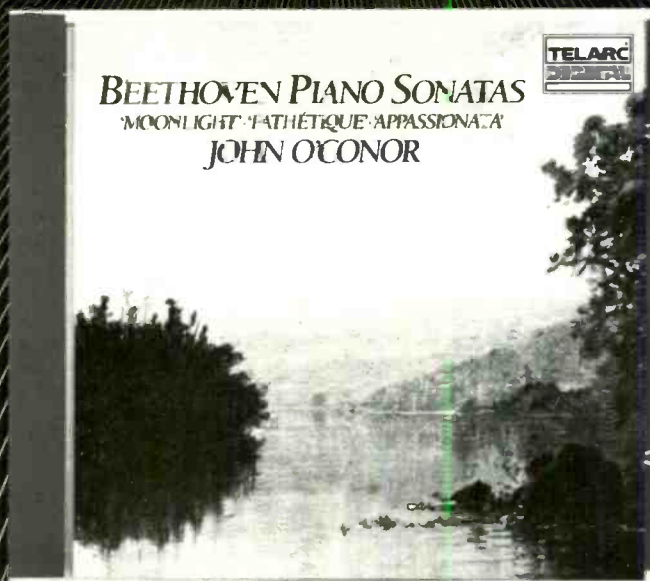
Duchable is a sensitive Lisztian and a wizard keyboard technician, with brilliance and drive that may evoke comparisons with Horowitz. The one disappointment here is Duchable's apparent unwillingness to provide the pianissimo playing Liszt asks for at certain key points in the sonata. He does come through with great subtlety and evocativeness in the three shorter works, which have not been done more persuasively in recent memory. Erato's sound is close up and manages to convey both the warmth and the glitter very effectively. On balance, I'd be a little happier with any of the other three recordings of the sonata I mentioned, but I'll certainly be interested in hearing more Liszt from Duchable. *R.F.*

**MENDELSSOHN: *Symphonies Nos. 1-5; Four Overtures*** (see Best of the Month, page 96)

**MOZART: *Arias. Vado, ma dove? O Dei! (K. 583); Parto, parto, ma tu ben mio (K. 621); Chi sà, chi sà, qual sia***

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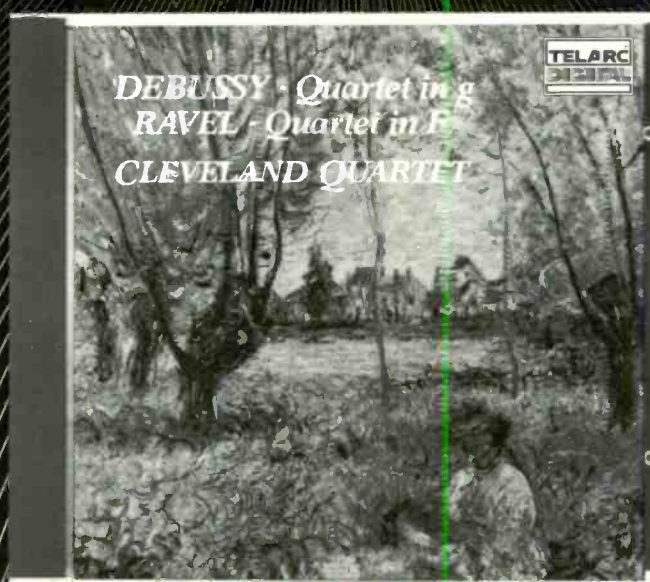
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(K. 582); *Ch'io mi scordi di te?* (K. 505); *Al desio di chi l'adoro* (K. 577); *Un moto di gioia me sento* (K. 579); *Motet, Exsultate, jubilate* (K. 165). Janet Baker (mezzo-soprano); Scottish Chamber Orchestra, Raymond Leppard cond. ERATO/RCA • NUM 75176 \$10.98, © MCE 75176 \$10.98.

Performance: *Superb*  
Recording: *Excellent*

Most of the works in this fascinating Mozart collection, arias and one youthful motet, are not what we would associate with Dame Janet Baker. But, as we have come to expect of this amazing singer, whatever she touches turns to pure gold. She has the range, her coloratura is clean and effortless, and the recitatives are done with an unusual depth of drama. In fact, it is wonderful to hear music usually sung by light voices projected by a fully supported mezzo-soprano with guts.

The Scottish Chamber Orchestra, which has gradually been establishing a reputation equal to its London counterparts, offers fine and sensitive support. Raymond Leppard paces the music in a noble way, and his piano obbligato in "Ch'io mi scordi di te?" is beautifully done. S.L.

**MOZART: Complete Piano Sonatas** (see Best of the Month, page 93)

**PAISIELLO: Il barbiere di Siviglia.** Dénes Gulyás (tenor), Almaviva; Krisztina Laki (soprano), Rosina; József Gregor (bass), Bartolo; István Gáti (baritone), Figaro; Sándor Sólyom-Nagy (baritone), Basilio; others. Hungarian State Orchestra, Ádám Fischer cond. HUNGAROTON • SLPD 12525-27 three discs \$32.94, © MC 12525-27 three cassettes \$32.94, © HCD 12525-26 two CD's no list price.

Performance: *Ingratifying*  
Recording: *Well-balanced, clear*

Both Paisiello's *Barbiere* and that of Rossini, which succeeded it by a few years, follow Beaumarchais's picaresque comedy faithfully. Indeed, there is no "big scene" from the original play or from the famous Rossini opera that does not appear also in Paisiello's version. The Slander Aria, the billeting of the "drunken" soldier, the music lesson, Don Basilio's "fever," even a storm episode for the orchestra to enjoy playing—all are found in Paisiello's graceful score.

The main difference between the two operas, and perhaps the reason why Rossini's became standard fare while Paisiello's is now a museum piece, lies in Rossini's greater comic gift. Paisiello's score is undeniably elegant, melodious, very singable, and good humored. Rossini's, however, is downright funny when it should be and always irrepressibly theatrical. The Slander Aria is a case in point. Paisiello's is a relaxed, tuneful account of the erosive effects of gossip; Rossini's is a musical description that gains in momentum, volume,

and intensity until Basilio's triumphant "come un colpo di canone," which sends Bartolo scuttling across the room.

In this Hungaroton recording, despite some heavy Italian pronunciation, the soloists perform their roles very well indeed, singing on pitch, with ease, and in command of the ornamented lines, which are less pyrotechnical than Rossini's but graced by considerable *fioratura* nonetheless. The recitatives are delightful. Ádám Fischer conducts a lively and crisp performance and elicits a fine sense of ensemble from the singers and the orchestra. R.A.

**STRAVINSKY: Symphony of Psalms; Fireworks, Op. 4; The King of the Stars; The Song of the Nightingale.** Berlin Radio Chorus and Symphony Orchestra, Riccardo Chailly cond. LONDON • 414 078-1 \$10.98, © 414 078-4 \$10.98, © 414 078-2 no list price.

Performance: *So-so*  
Recording: *Warm*

A curious mixture of works here—but why not? The layout sensibly alternates choral and nonchoral items so that there is no confusion over what is part of what, and none of the three less familiar works seems to be otherwise available at the moment. The performance of the very seldom heard *The King of the Stars*, however, is the only one of the four recorded here to which I'd be inclined to return. The other three are disappointing in varying degrees. The *Symphony of Psalms* receives little more than an efficient run-through. *Fireworks* comes off smoothly enough but conveys little in the way of festive enthusiasm, and *The Song of the Nightingale*, for all the lovely playing by the orchestra's various soloists, is chilly and unmoving. Happily, RCA is reissuing the magnificent Reiner/Chicago recording of the latter work for reissue on CD, and Bernstein's CBS record of the *Symphony of Psalms* remains outstanding in every respect. Surely there will be other recordings soon of the two shorter pieces. R.F.

**VAUGHAN WILLIAMS: Mass in G Minor** (See KODÁLY)

**VIVALDI: The Four Seasons.** Canadian Brass. CBS • M 42095, © MT 42095, © MK 42095, no list price.

Performance: *Super*  
Recording: *Fine*

Having reviewed Vivaldi's *Seasons* more than any other work, in versions using everything from original instruments to guitars, I dropped the stylus onto the LP of Arthur Frackenpohl's arrangement for the Canadian Brass with understandable misgivings. Birds and crickets for trumpets, indeed! But much to my surprise, it all works, once again proving the indestructibility of this ubiquitous masterpiece. It is a virtuosic performance, thrilling to the bone. You simply have to hear it to believe it. S.L.

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**WALLY BADAROU:** *Echoes*. Wally Badarou (vocals, piano, guitar, tambourine, synthesizers); other musicians. *Keys; Mambo; Voices; Canyons; Endless Race*; and five others. ISLAND 90495-1 \$8.98, © 90495-4 \$8.98.

Performance: *Colorful*  
 Recording: *Very good*

What a fascinating assortment of musical influences Wally Badarou brings to his work as a composer, producer, pianist, and master of synthesizers. Born in Paris of West African parents, from an early age Badarou absorbed everything from Beethoven to James Brown, Jimmy Smith, and Jimi Hendrix. After playing with various French rock bands, he formed a synthesizer-based Afro-soul group, then played behind Grace Jones before going on to write music for French films. All of these influences are apparent in his first solo album.

Badarou specializes in using synthesizers to simulate the sounds of Caribbean steel bands and African percussion orchestras. He plays with aural textures to evoke moods and mental images, but he never neglects the essential pulse that energizes his music. Sometimes you want to dance to it, but listening is best as he takes you through a *Jungle* or on an *Endless Race*. The most haunting of these synthesized sound pieces is *Canyons*. Admittedly, some of it sounds like film music, but Badarou's creative ruminations are so inventive that no pictures are needed. P.G.

**HÜSKER DÜ:** *Candy Apple Grey*. Hüsker Dü (vocals and instrumentals). *Crystal; Don't Want to Know If You Are Lonely; I Don't Know for Sure; Sorry Somehow; Too Far Down*; and five others. WARNER BROS. 25385-1 \$8.98, © 25385-4 \$8.98.

Performance: *Powerful*  
 Recording: *Improved*

The thinking man's hard-core band makes its major-label debut here, but

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this is *not* one of those high-gloss, smooth-out-all-the-rough-edges-with-a-big-name-producer sell-outs that are currently the rage in the record business. In fact, though "Candy Apple Grey" is noticeably better produced and cleaner sounding than any of the earlier Hüsker albums, it's still so unlike what conventional wisdom dictates is necessary for radio play that I'm surprised Warners had the guts to release it.

Musically the album is close to sensational. The key factor is Bob Mould, whose strangled vocals and massive, architectural guitar work are overwhelming (he's perhaps the first really distinctive instrumentalist to have emerged from the post-punk pack). Moreover, bassist Grant Hart—who seems to have a, shall we say, sunnier disposition—has turned into a first-rate songwriter. The counterpoint between Mould's anthems of confusion (*I Don't Know for Sure*) and Hart's pop tunes (*Don't Want to Know If You Are Lonely*) make for one of the neatest sweet-and-sour experiences since early Lennon and McCartney. An essential purchase. S.S.

**JERMAINE JACKSON:** *Precious Moments*. Jermaine Jackson (vocals); other musicians. *Do You Remember Me?; Lonely Won't Leave Me Alone; Precious Moments; I Think It's Love; Our Love Story*; and five others. ARISTA AL8-8277 \$8.98, © AC8-8277 \$8.98.

Performance: *One of his best*  
 Recording: *Excellent*

Jermaine Jackson's keen musicianship and attention to detail greatly enhance this new album, most of which Jackson wrote with Tom Keane, his co-producer. Both sides are filled with a wealth of melody and rhythmic buoyancy—sophisticated popular music combining the energy of contemporary disco with imaginative charts and unfailingly attractive vocals. Highlights include *I Think It's Love*, which Jackson wrote with Stevie Wonder, and *If You Say My Eyes Are Beautiful*, a duet with Whitney Houston that makes a fitting encore to their previous collaboration. But the greatest delights are the lilting and catchy title tune, *Precious Moments*, and *Words into Action*, which showcases Jackson's seamlessly smooth singing style.

I've often contended that while Michael Jackson may be the most charismatic performer in the talented Jackson family, his brother Jermaine not only possesses more substantial musical gifts but is a better singer. With "Precious Moments" I rest my case. P.G.

**THE JESUS AND MARY CHAIN:** *Psychocandy*. The Jesus and Mary Chain (vocals and instrumentals). *Just Like Honey; The Living End; Taste the*

*Floor; The Hardest Walk; Cut Dead; In a Hole; My Little Underground; Inside Me*; and six others. REPRISE 25383-1 \$8.98, © 25383-4 \$8.98.

Performance: *Pop gothic*  
 Recording: *Cavernous*

A lot of reasonable people have gone off the deep end about the Jesus and Mary Chain, and in principle I can see why: the band's influences are impeccable, or at least politically correct. The basic sound on "Psychocandy" is a synthesis of the fuzz guitars and pop tunefulness of the middle-period Ramones, an approach to rhythm and lyrics that recalls the early Velvet Underground at its most abrasive, and a Wagnerian wall of sound out of Phil Spector. In its peculiarly reductive way, this is actually innovative stuff, but it's also precious as hell and fogged in with that sort of British adolescent *Angst* that has proved so marketable for more pop-oriented acts like Tears for Fears. But perhaps we have a whole new genre a-borning here. Call it Miserabilism. S.S.

**JUDAS PRIEST:** *Turbo*. Judas Priest (vocals and instrumentals). *Turbo Lover; Locked In; Private Property; Parental Guidance; Rock You All Around the World*; and four others. COLUMBIA Ⓛ OC 40158, © OCT 40158, © CK 40158, no list price.

Performance: *Loud*  
 Recording: *Good*

Judas Priest, like acne, is something you outgrow after adolescence. The band understands this as well as you or I. Witness *Parental Guidance*: "You say I waste my life away, but I live it to the full. And how would you know anyway, you're just mister dull. . . ." So the battle lines are clearly drawn. You know where you stand. I know where I stand. But before "Mister Dull" heads out to do a little yard work, I do want to concede Mr. Downing's and Mr. Tipton's rare ability to stimulate the reptilian brain stem with their speaker-splintering Stratocaster attacks. If only there were enough hours in the day for all the good music that's been recorded and for Judas Priest. M.P.

**JOHN LENNON:** *Live in New York City*. John Lennon (vocals, guitar, piano); Yoko Ono (vocals, piano); Elephant's Memory (vocals and instrumentals). *New York City; It's So Hard; Woman Is the Nigger of the World; Well, Well, Well; Instant Karma (We All Shine On); Give Peace a Chance*; and five others. CAPITOL SV-12451 \$9.98, © 4XV-12451 \$9.98.

Performance: *Erratic*  
 Recording: *Okay*

Well, this is considerably more palatable than the recently released video

version of the same 1972 benefit concert (reviewed here in June), if only because you don't have to look at either Yoko Ono or Elephant's Memory. Nevertheless, it's a pretty uneven package. Even the better performances are plagued by an eccentric mixing job and heavy-handed playing by the boys in the band, and some of the songs (especially *Woman Is the Nigger of the World*, which was condescending and offensive in 1972 and is no less so now) do not, to be charitable, represent their creator at the top of his form. There are moments—a heart-rending *Mother*, an authoritative *Come Together*—when things almost click, but mostly this sounds like a period piece from a particularly mediocre period. S.S.

**REBA MCENTIRE:** *Whoever's in New England* (see Best of the Month, page 93)

**THE MODELS:** *Out of Mind Out of Sight*. The Models (vocals and instrumentals). *Out of Mind Out of Sight; Big on Love; Stormy Tonight; Ringing Like a Bell; King of Kings*; and five others. GEFEN GHS-24100 \$8.98, © M5G-24100 \$8.98.

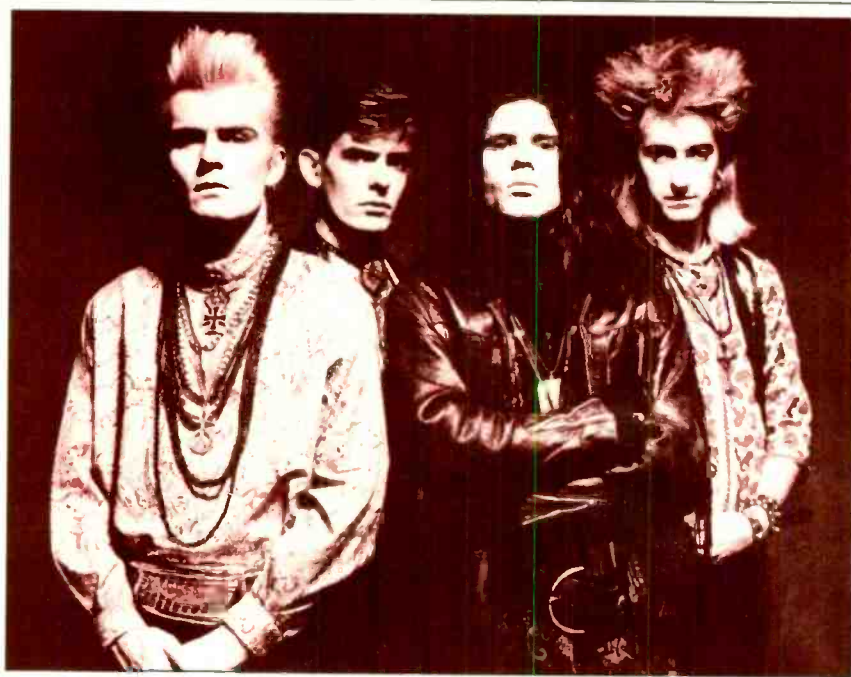
Performance: *Bombastic*  
Recording: *Ditto*

The advertisements for some now-forgotten grade-Z horror movie once advised audiences to say to themselves, "It's only a movie." I would offer similar advice—"It's only a record!"—to those who hear the debut album by a band of photogenic Australians called the Models and take it as a sign of the end of Western civilization. An enormously expensive-sounding mishmash of ideas from sources as dissimilar as the Cars and Queen, this is empty-headed pomp rock of the most banal kind—sniggering, crudely macho (*Big on Love*, indeed), and obviously tailor-made for today's rock radio, where it will probably be a huge hit. Consumer note: The cassette version comes with six extra songs, a packaging practice that in this instance adds insult to injury. S.S.

**THE MOODY BLUES:** *The Other Side of Life*. The Moody Blues (vocals and instrumentals). *Your Wildest Dreams; Talkin' Talkin'; Rock 'n' Roll Over You; I Just Don't Care; Running Out of Love*; and four others. THRESHOLD/POLYGRAM 422-829 179-1 \$8.98, © 422-829 179-4 \$8.98, © 422-829 179-2 no list price.

Performance: *Pop orgy*  
Recording: *Good*

I continue to approach each new Moody Blues album with the meagerest expectations and invariably come away liking the record more than I wanted to. "The Other Side of Life" is no excep-



## LOVE, THE CULT

**T**HE Cult's new album, "Love," reminds us that rock, more than any other type of music, is a genre defined by an instrument: the electric guitar. With apologies to the synth hordes, the great rock albums will always be great guitar albums. "Love" is a great guitar album. Forget about the band's occult trappings—the iron crosses and jeweled talismans, the Druidic haircuts and dark, menacing song titles (these guys used to be called the Southern Death Cult). Everything else recedes before the awesome display of heavy-metal firepower by guitarist William Duffy.

Duffy doesn't score any points for originality; in fact, his sources are so ill-disguised, much of "Love" sounds like homage. But what sources! Hendrix. Jimmy Page. Richie Blackmore. The Edge. Duffy's guitar growls, screams, cajoles, and thunders. On the epic title cut, Duffy puts together astonishing ten-ton power chords and a wildly dis-

torted lead part conjured up in a Purple Haze of wah-wah ornamentation. He reprises the technique in *Phoenix*, this time even more spectacularly out-Hendrixing himself. Even when he slows down, Duffy never relaxes. On *Brother Wolf*, *Sister Moon*, he spins an ornate line that twines itself around Ian Astbury's vocal like a pearl necklace.

Duffy's playing makes everything else on "Love" sound good too. Astbury's remote, intense vocals and the uncomplicated but insistent rhythm section come on here like the resurrection of heavy-metal—or like U2 in a fiercely angry mood. This one belongs in your guitar collection. *Mark Peel*

**THE CULT:** *Love*. The Cult (vocals and instrumentals). *Nirvana; Big Neon Glitter; Love; Brother Wolf; Sister Moon; Rain; Phoenix; Hollow Man; Revolution; She Sells Sanctuary; Black Angel*. SIRE 25359-1 \$8.98, © 25359-4 \$8.98.

tion. There's very little here that's original, clever, or moving, but it's hard to fight the simple, unashamedly gushy melodies, choirboy harmonies, sweeping, space-age synth textures, and rubber-band rhythms. Although "The Other Side" begins with what could be considered textbook Moody Blues, a cosmic love song called *Your Wildest Dreams* (give Justin Hayward and John Lodge credit—it takes guts to write music and lyrics this wimpy), the album quickly shifts gears into a kind of extravagant, candy-coated pop orgy in

which the Moodies pull out every cheap trick in the book. And they all work.

As soon as I heard the frantic, bouncing-off-the-walls beat and Hallelujah Chorus harmony of *Talkin' Talkin'*, it sounded so much like ELO I tore through the packaging thinking I'd missed Jeff Lynne's name in the credits. It wasn't there. When I heard the Moodies sing, "Like a rock, I'm gonna roll over you," I called their record company. No. Jeff Lynne hasn't joined the band. The shimmering, synthesized guitar and leg-kicking, chorus-line



chorus of *Running Out of Love* were the last straw. I called *Lynne's* record company. Still no.

The band comes back to earth—or, more accurately, returns to space—on side two, with somewhat disappointing results. They sound more like the old Moody Blues—like a band with a mission. Even here, though, there are enough perks—the walking-bass beat of *Slings and Arrows*, the fierce closing guitar solo of *It May Be a Fire*—to keep things interesting. "The Other Side of Life" continues the amazing second life of the Moody Blues. There ought to be a label warning about the mushbrain lyrics, but it's fun. *M.P.*

**NIGHTHAWKS: *Hard Living*.** Night-hawks (vocals and instrumentals); instrumental accompaniment. *Hard Living; High Ball; Yeah Man; I Don't Want to Be in Love; Price of Love; If You Don't Come Back; Memphis Beat; Louise*; and two others. VARRICK VR-022 \$8.98, © CVR-022 \$8.98.

Performance: *Exquisitely raunchy*  
Recording: *Excellent*

Nobody needs to own every Night-hawks album, but everyone should own at least one. If you don't have any, "Hard Living" will do nicely. These cruiserweights have been pounding out the same kind of big, mean, low-down

electric blues for better than fifteen years. If they hadn't had their music to keep them busy, they'd probably be breaking rocks at Leavenworth.

"Hard Living" is a chest-thumping blues assault—Jim Thackery's growling leads, Mark Wenner's raunchy harp, and a twenty-ton-test back-beat gang up to give your ticker a real going over. If you can't party to this, something somewhere important ain't hooked up right. But the best thing about the Night-hawks' blues is that the music doesn't bypass your brain on its way to your feet. "Hard Living" is loaded with the wisdom of experience peculiar to all good blues. Put on the Nighthawks and see what happens. But if you wake up the next afternoon with a tattoo you didn't have before, I disavow any responsibility. *M.P.*

**THE RAVE-UPS: *Town & Country*.** The Rave-Ups (vocals and instrumentals). *Positively Lost Me; Better World; In My Gremlin; Radio; By the Way; Rave-Up/Shut-Up*; and four others. FUN STUFF RU-103 \$8.98, © RU-103 \$8.98 (from Fun Stuff Records, P.O. Box 1814, Beverly Hills, CA 90213).

Performance: *Goin' for broke*  
Recording: *Appropriate*

If you can imagine the kind of music a band made up of Pete Townshend,

John Lennon, Bob Dylan, Tom Petty, Brian Wilson, Johnny Cash, and Carl Perkins might make, then you have an idea of what to expect from the Rave-Ups. Of all the synth-pop, cowpunk, and punkabilly bands to come along in the last few years, the Rave-Ups are the most accessible, with roots and influences hung out in the open for all to recall and enjoy. While too many of these bands drown with the weight of their own seriousness, the Rave-Ups—and particularly lead singer Jimmer (*sic*) Podrasky—write with wit, charm, and originality, even when they turn sarcastic and address themes of alienation and suburban brooding. Taken on the surface, good-time level or on an emotional, lyrical plateau, this one won't disappoint you. *A.N.*

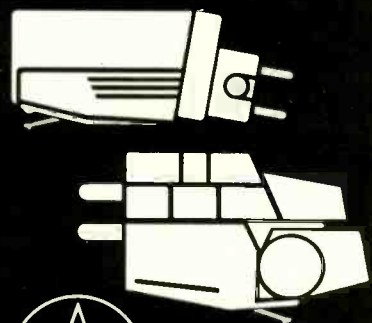
**STAN RIDGWAY: *The Big Heat*** (see Best of the Month, page 94)

**RUBBER RODEO: *Heartbreak Highway*.** Rubber Rodeo (vocals and instrumentals). *Heartbreak Highway; If You're Ever Alone; Souvenir; Deadtown*; and five others. MERCURY 826 886-1 \$8.98, © 826 886-4 \$8.98.

Performance: *Rubbery*  
Recording: *Very good*

Rubber Rodeo's new album comes down squarely on the "rubber" and not

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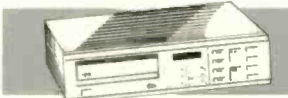
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## CLEANED-UP STONES



**I**F nothing else, "Dirty Work," the latest album from the entertainment conglomerate known as the Rolling Stones, is the cleanest-sounding record of their career. Given the published reports of internal bickering during the recording sessions, that is somewhat surprising. What is less surprising is that the album, to paraphrase Randy Newman, seems to have little reason to live. It's the first Rolling Stones album in memory that more or less goes in one ear and out the other.

Not that there aren't things to admire about it. The production is close to exemplary, Mick Jagger's vocals are less mannered than usual, the guitars ring out like U2, Charlie Watts's drums (apparently computer-enhanced) sound bigger than life, and the various supporting players (Jimmy Page, Don Covay, Tom Waits) are kept discreetly in the background. Granted, you miss the kind of glorious clutter and illusion of spontaneity that even informed the band's more mediocre earlier work, but at least in the abstract "Dirty Work" sounds like a great Stones record.

The songs, however, are almost uniformly forgettable. *Harlem Shuffle*, the obscure early Sixties soul song that is the album's centerpiece, is a likable bit of minstrelsy, but it has none of the impact of the band's early r-&-b renovations (compare the "Out of Our Heads" version of *Cry to Me* and you'll

see what I mean). It seems more a throwaway than anything else.

The remaining tracks are strictly pro forma. Jagger waxes angry (on the title song, *Back to Zero*, and *Winning Ugly*) about everything from the dangers of nuclear war to the difficulty of getting good help these days, and Keith Richards riffs up the usual storm behind him, but the overall effect is like Chinese food. You'll want to hear something else half an hour after you've finished listening.

There are two small exceptions. On the plus side, *Had It with You* is a wonderfully scuzzy blues honk of the sort only this band can pull off. On the other hand, *Sleep Tonight* is a real disaster, one of Richards's trademark sensitive-tough-guy ballads, and the first to cross the line into colossal self-parody.

As a lapsed Stones fan who really wanted this album to make me care about the band again, it pains me to say it, but "Dirty Work" sounds more like temp work.

Louis Meredith

**THE ROLLING STONES:** *Dirty Work*. The Rolling Stones (vocals and instrumentals); other musicians. *One Hit (to the Body)*; *Fight*; *Harlem Shuffle*; *Hold Back*; *Too Rude*; *Winning Ugly*; *Back to Zero*; *Dirty Work*; *Had It with You*; *Sleep Tonight*. COLUMBIA OC 40250, © OCT 40250, © CK 40250, no list price.

the "rodeo" side of the group's techno-country sound. In what the promotion material calls "a semi-autobiographical story of a man and a woman's relationship," lead singers Trish Milliken and Bob Holmes move through a sequence of songs that don't mean much apart but together form an engaging theme album of romantic disillusionment and renewal. Where I come from, though, this will hardly be the hit of the trailer park.

A.N.

**THE SWIMMING POOL Q'S:** *Blue Tomorrow*. Jeff Calder (vocals, guitar); Anne Richmond Boston (vocals); Bob Elsey (lead guitar); Billy Burton (drums, percussion); J. E. Garnett (bass). *Now I'm Talking About Now*; *She's Lookin' Real Good (When She's Lookin')*; *Pretty on the Inside*; *Laredo Radio*; and six others. A&M SP 5107 \$8.98, © CS 5107 \$8.98, © CD 5107 no list price.

Performance: *New Age folk rock*  
Recording: *Good*

"Blue Tomorrow" could almost be the work of two different bands—one a serious group of folk-rock revivalists, the other a sardonic, c-&-w reincarnation of Dan Hicks and His Hot Licks. Anne Richmond Boston leads the first group, and her songs—*Now I'm Talking About Now*, *Pretty on the Inside*, *Wreck Around*—are pretty, tuneful, and conventionally structured, with rich vocal harmonies and identifiable beginnings, middles, and ends. Boston sings about the heart in lyrics that are oblique but sober-minded.

The second group is led by Jeff Calder. His songs are acerbic and witty (although at times his cynicism is given a bit too much rein, as on the ugly, Ozzy Osbourne *Corruption*). They're also chaotically arranged and a lot more fun than Boston's. Calder can flat out set a lyric to a tune. The automotive rhythms in *She's Lookin' Real Good* are just the thing to drive Calder's macho narrator as he checks out a passing siren, and the huffing, grinding guitar of *Big Fat Tractor* rolls over you like a three-inch-deep tire tread. Calder's snarling wise-guy vocals on *Laredo Radio* deliver a crushing blow to the desperate talk-radio caller who's pre-empted before he can get an answer.

Fortunately for both bands, they have lead guitarist Bob Elsey and bassist J. E. Garnett working for them, because these two provide the album's best moments. Garnett creates a percolating back beat that he can play straight or for laughs, and Elsey has an unerring feel for the right guitar sound, which can range from the droning, fuzz lead of *Now I'm Talking About Now* to the wobbly, peripatetic slide guitar of *She's Lookin' Real Good*. Elsey and Garnett's savvy feel for Eighties pop rhythms and electronic effects, combined with an old-fashioned acoustic sensibility and applied to material that evokes bands like the Byrds, the old Jefferson Airplane, and even Peter, Paul and Mary, make the Swimming Pool Q's one of the

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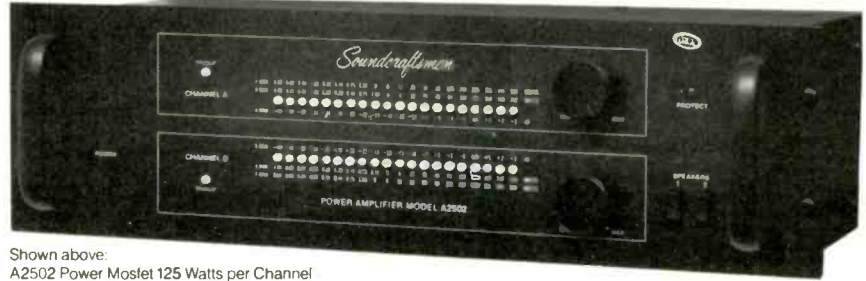
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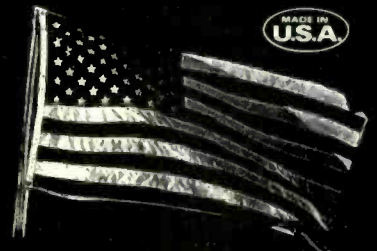


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most original bands in pop. Or perhaps two of the most original. *M.P.*

**TANYA TUCKER:** *Girls Like Me.* Tanya Tucker (vocals); vocal and instrumental accompaniment. *One Love at a Time; I'll Come Back as Another Woman; Fool, Fool Heart; Somebody to Care;* and six others. CAPITOL ST-12474 \$8.98, © 4XT-12474 \$8.98.

Performance: *Half-throttle*  
Recording: *Good*

After a three-year hiatus from recording, Tanya Tucker is back with a new label and her old producer, Jerry Crutchfield. Now twenty-six years old, Tucker has been making records for exactly half her life, and her new album reflects her hard-won maturity. In contrast to the sexy country-rockers that kept her at the top of the charts in the last decade, "Girls Like Me" is made up mostly of mid-tempo songs (the single *One Love at a Time*) and ballads, usually of the woman-in-pain variety.

Tucker's voice, with its little Connie Smith catch at the end of the phrase, is still compelling, but the album has its problems. The production is competent but bland, and with the exception of three or four cuts—especially the title song and *Still Hold On*—Tucker doesn't really seem to have her heart in her work, probably because the material is not that strong overall. In the end, it's not a bad album, but it's certainly not Tanya Tucker's equivalent of "Private Dancer." Give her time, though. There's a lot more grit where this came from. *A.N.*

**VIOLENT FEMMES:** *The Blind Leading the Naked.* The Violent Femmes (vocals and instruments); Jerry Harrison (keyboards); Leo Kottke (guitar); other musicians. *Old Mother Reagan; Breakin' Hearts; Special; Candlelight Song; Children of the Revolution; Cold Canyon; Heartache;* and six others. SLASH/WARNER BROS. 25340-1 \$8.98, © 25340-4 \$8.98.

Performance: *Smart*  
Recording: *Very good*

Here's a sharp little record by a consistently fascinating little neo-acoustic band. Gordon Gano, who does the bulk of the songwriting and singing, is one of those pop eclectics who seems equally at home with modified folk music, old-timey blues, the Velvet Underground, and even Seventies glam rock. You can hear echoes of all these, and a lot more, on this album, nicely produced by the Talking Heads' Jerry Harrison. You also get the feeling of a sort of outsiders' sensibility that seems peculiar to the brighter young pop musicians and links such seemingly dissimilar types as the Replacements and the SST hard-core bands. Pick to click: an astonishingly poignant version of T. Rex's *Children of the Revolution*, which is a song that I had never previously considered anything more than borderline camp. Check this one out. *S.S.*



*Yoakam: wowing 'em in L.A.*

**DWIGHT YOAKAM:** *Guitars, Cadillacs, Etc., Etc.* Dwight Yoakam (vocals, guitar); vocal and instrumental accompaniment. *Honky Tonk Man; It Won't Hurt; I'll Be Gone; South of Cincinnati; Guitars, Cadillacs;* and five others. REPRISE 25372-1 \$8.98, © 25372-4 \$8.98.

Performance: *Rising star*  
Recording: *Okay*

In one of the most bodacious hype campaigns known to humankind, twenty-nine-year-old Dwight Yoakam has arrived full-blown from the head of Hank Williams to capture both the cornbread-and-beans crowd and the zombie slaves of MTV.

Essentially a revivalist of the traditional hard-country, Fifties honky-tonk sound, Yoakam, a native of Pikeville, Kentucky, has been wowing 'em out in L.A. with his longneck-beer-bottle style since the late Seventies. *L.A.?* you say? Yep, says Yoakam with pride, "My music was too country for Nashville."

But Yoakam, with his smooth face, his snake hips, and his trim thighs, may also have been too cool for Nashville in the late Seventies, so now he's come through the same door that Emmylou Harris did a decade ago—winning the hip, pop California audience with a music of intense, hardscrabble purity. Of course, cutting a duet with Lone Justice's Maria McKee (*Bury Me*) and possessing a "knowing" attitude and the proper pointy-toed boots helps too. And Yoakam has all that, plus his rural Kentucky pedigree and a name too hick to possibly be made up.

But is Yoakam as good as they say? Well, he is very, very good. He has a chicken-pickin', four-piece band with an unerring sense of where to solo—and where to hold back. He has a good feel for choosing the right cover tunes and knows how to breathe new fire into them. And he writes affecting songs

with all the requisite hillbilly themes: prison, coal mining, a woman that time and whiskey won't erase, a "fanatical worship of all things dead and miserable," as one writer put it, and, of course, Mother—in this case, presumably, an authentic Mammy Yoakam.

Where I have difficulty with Yoakam is in his vocal nuances—exactly what some critics find most winning about him. Yes, he can moan and twang and sing through his nose and convey the kind of pain only a barstool weeper can know. But the mannered breaks and catches in his vocals come across as more acquired than natural, and far too imitative of Hank Williams.

For all its emphasis on tradition, the album carries its own peculiar mark of Hollywood, romanticizing not only the land of black lung and white lightning but also the happy neon hunting grounds where strangers—and neotraditionalist country bands with videos on MTV—go bump and hump in the night. Still, I think you'll find it's a pretty terrific album. *A.N.*

## Collection

**COVER ME—Songs by Bruce Springsteen.** Dave Edmunds: *From Small Things (Big Things One Day Come)*. Southside Johnny & the Asbury Jukes: *Talk to Me; Love on the Wrong Side of Town; Fever; Hearts of Stone*. Gary U.S. Bonds: *Club Soul City; This Little Girl*. Patti Smith: *Because the Night*. Johnny Cash: *Johnny 99*. And four others. RHINO RNIN 70700 \$8.98.

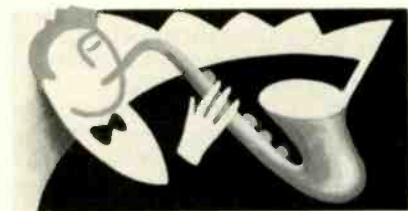
Performance: *Good all around*  
Recording: *Good*

If there was any doubt that 1985 was the Year of Bruce Springsteen, the appearance of "Cover Me" clinches it. That this collection of Springsteen song covers was released by Rhino Records and not K-Tel, however, says a lot about the quality of the performances. Rhino is the rocker's rock label, having released everything from collections reprising the garage-band and psychedelic eras to entire albums devoted exclusively to covers of *Louie Louie*. You won't find here, for example, the Pointer Sisters' version of *Fire*, a cover that made absolutely no biological or sociological sense but did make the Pointers a pile of money. You will find Robert Gordon's vastly superior rendering.

Longtime Springsteen fans (the kind who own every album by Southside Johnny and the revived Gary U.S. Bonds) already know most of these tracks. For everyone else, "Cover Me" is a pointed reminder of how truly great Springsteen is as a romantic songwriter—something that gets overlooked in all the working-class heroism that, for better or worse, he's now associated with. David Leaf's excellent liner notes have some interesting things to say about the songs and about why Springsteen hasn't recorded many of them. A must for the legions who love The Boss. *M.P.*



# JAZZ



**JEANNIE AND JIMMY CHEATHAM: *Midnight Mama*.** Jeannie Cheatham (vocals, piano); Jimmy Cheatham (bass trombone); Snooky Young (trumpet); Eddie "Lockjaw" Davis, Dinky Morris, Jimmie Noone, Curtis Peagler (saxophone); other musicians. *Wrong Direction Blues; Piney Brown; Worried Life Blues; Finance Company Blues*; and five others. CONCORD CJ-297 \$8.98, © CJ-297-C \$8.98.

Performance: *Joyful romp*  
Recording: *Excellent*

That Jeannie and Jimmy Cheatham would have a follow-up album to "Sweet Baby Blues" was inevitable. If nothing else, the whimsical *Meet Me with Your Black Drawers On* simply demanded a further statement. That tune's counterpart on the new album, "Midnight Mama," is a lively original

called *Reel Ya' Deel Ya' Dee Dee Dee*, complete with the Glee Club, as annotators Helen and Stanley Dance call the Cheatham vocal ensemble, but this new release also has a lot more to offer. Best-arrangement honors go to the Cheathams for turning that old blues warhorse *C. C. Rider* into a thing of rare, Ellingtonian beauty. Here, as on two other songs, *How Long Blues* and *Wrong Direction Blues*, clarinetist Jimmie Noone makes eloquent reedy remarks that would have made his father proud, and substantial input also comes from tenor saxophonist Eddie "Lockjaw" Davis.

All in all, this album is a joy from beginning to end, a wonderful reminder of a time when groups like Louis Jordan's Tympany Five and small bands led by the likes of Hot Lips Page and Lionel Hampton stirred a whole lot of fun into a rhythmic jazz blend. *C.A.*

**EASTMAN JAZZ ENSEMBLE: *Live!*** Eastman Jazz Ensemble, Rayburn Wright dir. *Sound Down; Uncle Heavy's Pork Chop Review; Viz Biz; I Never Told You*; and three others. SECOND HEARING NGS © 9002 \$15.98.

Performance: *Skillful*  
Recording: *Excellent remote*

The Eastman Jazz Ensemble and its sub groups, Auricle and Saxology, is made

up of students from the Eastman School of Music. As you'd expect, the Ensemble exhibits impressive skills, but its technical fluency serves a good deal of creative musicianship as well. With one exception—*Moon Germs*, recorded in 1982—this new CD-only release on the Second Hearing label is culled from 1975 and 1976 concert performances originally released on LP by Mark Records. Whether or not you recognize any of the names of the performers in the group is unimportant; the compositions and big-band arrangements are better than a lot of name-brand fare. In fact, this is a thoroughly musical, beautifully executed program of modern big-band and small-group jazz. I strongly recommend it. *C.A.*

**PAULA HATCHER: *Rise and Shine!*** Paula Hatcher Jazz Quartet; Charlie Byrd (guitar). *Sophisticated Lady; Lover Man; Carioca; Jelly Roll; Night Dreamer; Seven Come Eleven*; and five others. NEWPORT CLASSIC © NC 30009 \$10.98.

Performance: *High-grade*  
Recording: *Excellent*

Flutist Paula Hatcher, a Peabody Conservatory graduate and faculty member, has appeared on many concert stages throughout the country, so you just might have heard her play. If not, I

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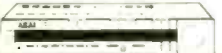
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## JAMES WILLIAMS



**F**OR all the talk one hears about the demise of jazz, there seems to be no dearth of new album releases. Jazz may not be going in an exciting new direction these days, but it is certainly not dead. Of course, much of what passes for jazz is just so much twaddle, diluted strains of the real thing, but there are exceptions. One big one is "Progress Report," into which pianist James Williams has obviously put a lot of thought as well as a wealth of talent.

Talent abounds in this set, though few of the players' names are yet household words. Williams himself is an alumnus of Art Blakey's Jazz Messengers and has five previous albums to his credit as a leader (four on the Concord label, one on Sunnyside). Each successive release reveals his continuing musical maturation, not only as a pianist but also as a composer and arranger. Among his tunes here are *Mr. Day's Dream*, *Affaire d'amour*, and *Progress Report*, three distinctly different works that bring out the salient qualities of this excellent group of musicians. Bill Easley's lovely flute graces *Affaire d'amour*, which is dedicated to the memory of Duke Ellington.

The exceptionally gifted guitarist Kevin Eubanks, whose own albums have not done his artistry full justice, imbues *Mr. Day's Dream* with substance and veritabily sets *Progress Report* on fire with his stunning instrumental technique and fertile musical mind. Throughout these and other tracks there is also the solid work of saxophonist Billy Pierce, a longtime associate of Williams, and a rhythm section propelled with finesse by drummer Tony Reedus and the ever-skillful bassist Rufus Reid.

This is not just another jazz album. We will remember this one long after the fusioners have synthesized their last notes, and I recommend it wholeheartedly. *Chris Albertson*

**JAMES WILLIAMS:** *Progress Report*. James Williams (piano); Bill Easley (alto saxophone, flute, clarinet); Billy Pierce (tenor and soprano saxophones); Kevin Eubanks (guitar); Rufus Reid (bass); Tony Reedus (drums); Jerry Gonzalez (congas). *Progress Report*; *Episode from a Village Dance*; *Affaire d'amour*; *Mr. Day's Dream*; *Unconscious Behavior*; *Renaissance Lovers*. SUNNYSIDE SSC-1012 \$8.98.

strongly urge that you check out "Rise and Shine!," a superb cassette release featuring Hatcher's quartet and guest artist Charlie Byrd recorded live in a 1985 performance at the Brooklyn Conservatory of Music.

I think of Paula Hatcher's music as a "blend" because it has more ingredients than Heinz has varieties. After getting off to a flying start with the old Benny Goodman classic *Seven Come Eleven*, the group bounces effortlessly through works by Duke Ellington, Chick Corea, Wayne Shorter, Jerome Kern, Cole Porter, and Vincent Youmans, with odd stops along the way. The final destination is *Battle Hymn of the Republic*, a weary war horse that, for reasons beyond my comprehension, jazz people seem to be mounting lately, and I have to admit that even it fares well here. Don't miss this one. *C.A.*

**KAZUMI WATANABE:** *Mobo Splash*. Kazumi Watanabe (guitars, guitar synthesizer, keyboards, digital sampler); David Sanborn (alto saxophone); Michael Brecker (tenor saxophone); other musicians. *Afternoon in the Park*; *Crisis III*; *Busiest Night*; *Synapse*; and four others. GRAMAVISION 8602-1 \$9.98, © 8602-4 \$8.98, © 8602-2 no list price.

Performance: *Energetic*  
Recording: *Excellent*

Japanese guitarist Kazumi Watanabe plays high-wattage fusion music that can be quite engaging, but it is also at times too mechanical for my ears. "Mobo Splash," his fourth album for Gramavision, was recorded partly in Tokyo and partly during his first American tour last year. It is slick and precise, it generates rhythmic responses, and it contains surging solos by two American saxophonists, David Sanborn and Michael Brecker. Watanabe himself is both adept and creative, but there is still something cold and metallic about it all. *C.A.*

**MARGARET WHITING:** *The Lady's in Love with You*. Margaret Whiting (vocals); instrumental accompaniment. *Being Alive*; *I Get Along Without You Very Well*; *You Turned the Tables on Me*; *I'll Remember April*; *Boy! What Love Has Done to Me!*; and eight others. AUDIOPHILE (D)AP-207 \$7.98.

Performance: *Still smooth*  
Recording: *Good*

Margaret Whiting has been singing tender ballads and whimsical ditties since the early days of Capitol Records, a label she helped establish. "The Lady's in Love with You" was recorded last year, and the voice is nearly intact. Sure, there are faint signs of wear here and there, but Whiting—herself a songwriter and the daughter of Richard Whiting—knows how to handle a lyric. Without that ability even the greatest voice is useless. You will also enjoy the program, a mixture of familiar and unusual songs, as well as the liner notes by Mel Tormé. *C.A.*



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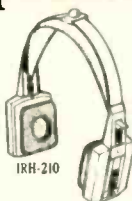
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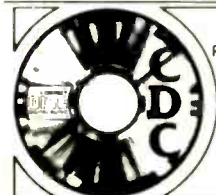
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## HOW TO BUY A RECEIVER

*Continued from page 88*

power and should thus be connected only to an unswitched outlet.

Headphone jacks are another important option to consider. While most receivers contain at least one jack, which may be sufficient for you, some users require extra jacks for a variety of purposes. Some receivers even offer a separate, built-in headphone amplifier and volume control; this allows one person to listen to the program source through the system's speakers at one volume while another person listens through headphones at a different volume. Other receivers offer the built-in circuits needed to power electrostatic headphones. All in all, if you live in a thin-walled condo or apartment, or just enjoy using headphones, make sure the receiver you buy meets your headphone needs.

### Showroom Strategy

When you go out shopping for a receiver, you should have a clear idea of your needs and your budget. If you don't know exactly what you want and how much you can afford to spend, a persuasive salesperson could easily talk you into a "better" model that costs too much and has features or capabilities you don't really need. Remember, price does not necessarily indicate quality. A \$2,000 receiver with every conceivable feature may not perform any better in your particular situation than one that costs, say, \$500.

Walk out of any store that does not have the advertised sale product you came in to see; the store is using "bait and switch" tactics to get you to buy something more expensive. Also, be wary of salespeople who don't understand audio terms.

Always take some of your own records, tapes, or CD's with you to audition a receiver. That way you'll have a familiar reference for how the music should sound. Similarly, try the tuner section on the stations you listen to, not the salesperson's favorites.

Do not, under any circumstances, buy the first receiver you try out. Examine all the features, sit down, relax, and listen to one model, and then try another. Then go to another store and audition a few more. Once you get the hard work of setting priorities and budgeting out of the way, shopping for hi-fi equipment can be fun. And if you're careful in making a selection, you can take the fun home with you. □



## NEW PRODUCTS



### Sony

The 100-watt TA-F444ESII (shown) and the 80-watt TA-F222ES integrated amplifiers from Sony have inputs for two video sources, two tape sources, a tuner, a turntable, and a Compact Disc player. For increased channel separation and decreased noise and distortion, the amplifiers use Audio Current Transfer circuitry and a Super Legato Linear nonswitching d.c. power stage. Features include a linear-gain volume control, bass-boost and tone-defeat controls,

speaker switching, and an infrasonic filter. Both models can be used with either moving-magnet or moving-coil cartridges.

The TA-F444ESII is rated for 100 watts per channel minimum rms output into 8 ohms with no more than 0.0004 percent total harmonic distortion (THD). Price: \$450. The TA-F222ES is similarly rated for 80 watts into 8 ohms with no more than 0.0006 percent THD. Price: \$350. Sony, Dept. SR, Sony Drive, Park Ridge, NJ 07656.

**Circle 123 on reader service card**



### Threshold

Threshold's S/200 stereo power amplifier, rated at 100 watts per channel, is said to maintain low distortion into any speaker regardless of its impedance or reactance. The Stasis output stage of the amplifier uses a tandem topology: the pure Class A voltage amplifier is connected directly to the speaker load to determine signal accuracy, and the power is provided by a "current-mirror bootstrap" amplifier stage. This design

is said to eliminate the need for any global feedback correction. The amplifier can produce a continuous 8 amperes of current per channel, and as much as 20 amperes for short periods of time, for an output of 600 watts per channel into 2 ohms. The S/200 is 19 inches wide, 9½ inches high, and 9¼ inches deep. It weighs 44 pounds. Price: \$1,590. Threshold, Dept. SR, 1832 Tribute Rd., Suite E, Sacramento, CA 95815.

**Circle 124 on reader service card**

### AR

The AR Powered Partners are small speakers with an equalized amplifier in each enclosure driving a 4-inch woofer and a 1-inch cone tweeter. The speakers can be used with a portable CD player, pocket stereo, or any other source component that has a miniplug headphone jack. They can be powered either from an ordinary a.c. outlet or through a car's cigarette-lighter jack.

The speakers' five-sided triangular enclosures allow them to be mounted in room corners or anywhere that a wall meets the ceiling or floor. Removable caps on their backs allow them to be mounted on 1¼-inch poles. Optional clamps are available for mounting on walls or on tables, shelves, and other horizontal surfaces. Built-in handles make the speakers easy to move around. Each speaker has volume and



tone controls and a power switch. The drivers are shielded to prevent picture distortion if the speakers are used near a video screen.

Frequency response of the AR Powered Partners is rated as 60 to 25,000 Hz +0, -3 dB. They are said to produce a peak sound-pressure level of 106 dB. The speakers measure 6 x 10½ inches on the front side, with a depth of 7½ inches. Price: \$339.95 per pair; optional wall clamps, \$20 per pair; table/shelf clamps, \$45 per pair. Acoustic Research, Dept. SR, 330 Turnpike St., Canton, MA 02021-2003.

**Circle 125 on reader service card**



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## Introducing DPD™ from Proton

If you're running that terrific new CD player off an amplifier or receiver that's three to five years old, you're missing out on a great deal of clean, uncompromising sound. Most amps of that vintage just can't create the extra headroom that's necessary for accurate digital reproduction. Every time the music hits a peak, your amp will be gasping for breath. And you'll definitely hear about it. Unless you have a Proton 40 Series amplifier or receiver with our exclusive, patented DPD circuitry.

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## NEW PRODUCTS

### Nady Systems

Nady's powered wireless speakers receive signals broadcast from a small FM transmitter (not shown) that can be attached to a stereo system. The speakers can be placed as far as 100 feet from the transmitter and can be set so that one receives the left channel and the other the right channel. Each speaker has a 6½-inch woofer and a 1¼-inch cone tweeter, with knob controls for power on/off, volume, tone, and noise squelch. The speakers can be powered

using the supplied a.c./d.c. adaptor or by eight D-cell batteries.

The built-in amplifiers are rated at 15 watts into 4 ohms with 1 percent total harmonic distortion. Frequency response is said to be 40 to 15,000 Hz  $\pm$  3 dB, signal-to-noise ratio as more than 60 dB. Price: \$199.95 for one speaker, the transmitter, and a microphone for PA applications (WTS-1); \$99.95 for each additional speaker (WS-2). Nady Systems, Dept. SR, 1145 65th St., Oakland, CA 94608.

**Circle 126 on reader service card**



### Cabasse

The Galiote from Cabasse, a French speaker manufacturer, is a two-way system with a 6½-inch dome woofer and a 1-inch tweeter. The woofer diaphragm is made from a honeycomb material that is placed between two thin facings and molded into a dome, which is said to be rigid and highly resistant to deformation. An optional signal processor called the Active Compensator allows the user to adapt the Galiote speaker system to a particular listening room's acoustics.

The Galiote's rated frequency response is 70 to 20,000 Hz  $\pm$  4 dB. The crossover frequency is 4,000 Hz. With an input of 1 watt, it will produce a sound-pressure level of 93.5 dB at 1 meter distance. Peak power-handling capability is said to be 700 watts. The speaker is finished in walnut veneer and measures approximately 8 inches square at the base and 12 inches high. Price: \$900 per pair; Active Compensator, \$185. Distributed by Madrigal Ltd., Dept. SR, P.O. Box 781, Middletown, CT 06457.

**Circle 127 on reader service card**



### Cooustic

The Cooustic EQ-1030 car stereo equalizer/analyzer/preamplifier has a remote control and a detachable active crossover. A pink-noise generator and calibrated microphone allow real-time spectrum analysis from any listening position in the car, with levels displayed on the remote unit. The seven equalizer bands, each covering two and a half octaves, are centered at 60, 150, 400, 1,000, 2,400, 6,000, and 15,000 Hz. Response in each band can be boosted or cut by 12 dB. Four EQ curves can be put into memory.

Using an 18-foot DIN cable as a temporary connection, the crossover can be adjusted from inside the car while listening to the results. The low- and high-pass frequencies can be set at 40, 80, 160, or 320 Hz, and the input sensitivity and subwoofer output level can be adjusted (the latter up to +12 dB). Crossover slopes are 12 dB per octave. The EQ-1030 has front and rear preamp-out jacks and a CD player input jack. Circuitry for dbx noise reduction is also included. Price: \$299.95. Cooustic, Dept. SR, 4260 Charter St., Vernon, CA 90058-2596.

**Circle 128 on reader service card**

# If you can't afford it, spare yourself the heartache of listening to it.

We are all aware that money aside, it is an easy matter to upscale our quality of life, but difficult to lower it. In this regard, ignorance is bliss and strict abstinence is sometimes better than a taste of something finer that we can't have. So it is with Concord high-fidelity, high performance car audio. One listen, one taste, will significantly alter your demands for mobile high-fidelity.

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A few of the features found in the HPL 540 shown here are: Dolby B and C noise reduction systems, tuner/tape switch, tape search, and the smooth convenience of full logic tape controls. The ergonomic design insures easy operation of all functions.

One listen to all of this and you will be exhilarated, and if you've read this far you are no longer blissfully unaware. Your taste has been improved. If you can't afford it, you already *deserve*, and probably *demand* the best in design, engineering and of course—uncompromising performance.



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## Infinity

Infinity's RS series of speaker systems consists of the three-way RS4000 (shown) and three two-way systems, the RS300, RS200, and RS1000. All four models have polypropylene woofers, 6-ohm impedances, and simulated-oak vinyl-finished cabinets designed for minimal diffraction.

The RS4000 has an 8-inch woofer, a 3½-inch polypropylene midrange, and an EMIT tweeter with adjustable level. Frequency response is rated as 44 to 32,000 Hz  $\pm$  3 dB. The system can be used with amplifiers rated from 20 to 125 watts per channel. The RS3000 has an 8-inch woofer and a 1-inch Polycell tweeter; the RS2000, with a 6½-inch woofer, and the RS1000, with a 4½-inch woofer, have 1¾-inch Polycell tweeters. Prices per pair: RS4000, \$458; RS3000, \$298; RS2000, \$198; RS1000, \$138. Infinity Systems, Dept. SR, 9409 Owensmouth Ave., Chatsworth, CA 91311.

Circle 129 on reader service card



## Genesis

The Model 66, a three-way design with an unusual cabinet, is the top-of-the-line speaker from Genesis. The cabinet corners are faceted at a 45-degree angle for better dispersion, less diffraction, and less distortion than conventional cabinets with 90-degree corners. The sides are nonparallel to reduce internal standing waves. To reduce standing waves in the listening room, the front of the speaker is angled backward 8 degrees from the vertical.

The ¾-inch dome tweeter is double-inverted, and the 3-inch midrange is a convex dome. Two 8-inch woofers radiate forward, with rear radiation escaping through a vent in the fourth-order cabinet. Use with amplifiers producing between 30 to 350 watts per channel is recommended. Frequency response is given as 28 to 22,000 Hz  $\pm$  3 dB. The Genesis 66 is veneered in oak or other woods. It measures 44 x 18 x 12 inches and weighs 81 pounds. Price: approximately \$1,500 per pair. Genesis Physics, Dept. SR, 225 Heritage Ave., Portsmouth, NH 03801.

Circle 131 on reader service card

## dbx

The Soundfield 1A is an improved version of dbx's first speaker. Designed to create a realistic soundstage from every location in the listening room, each speaker produces an egg-shaped radiation pattern with the greatest amplitude directed toward the opposite speaker. To accomplish this, the drivers in each phased array receive signals that have been individually altered in frequency and phase response by the crossover networks. Each speaker has fourteen drivers: four 10-inch cone woofers (said to be more rugged than the woofers in the Soundfield One), four 4-inch cone midranges, and six ½-inch dome tweeters. To compensate for placement near reflecting walls, the new Soundfield Controller (not shown) includes a switch that tailors the equalization of the signal. Frequency response is rated as 20 to 20,000 Hz  $\pm$  3 dB. Price: \$2,950 per pair, including the controller. dbx, Dept. SR, 71 Chapel St., Newton, MA 02195.

Circle 130 on reader service card



## Bolit

Bolit 707 is an acrylic polishing compound that is said to remove fingerprints, dirt, and scratches from Compact Discs. To eliminate scratches, the polish removes a minute amount of the damaged disc surface and fills in where the plastic has been scratched away. A protective coating remains on the disc

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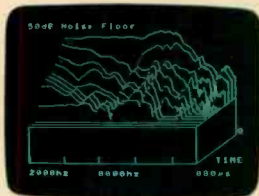
THE NOISE.

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drivers that stop producing sound almost immediately after the signal from the amplifier ends. The benefits are distortion-free sound from solo instruments, and superb detail and a sense of separation from groups of instruments.

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The Pioneer® SD-P40 is not a projection television. It is a projection *monitor*. The first of its kind.

And in one masterstroke, all—not some, but *all*—of the compromises associated with projection television have been eliminated.

In fact, the SD-P40 is not merely far

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# PIONEER INTRODUCES THE WORLD'S FIRST PROJECTION MONITOR.

superior to *any* other conventional projection system, it is also superior to all but a few direct-view monitors.

## 450 LINES. AND THAT'S THE BEGINNING.

The horizontal resolution on the SD-P40 is more than 450 lines.

The brightness is more than 300 footlamberts. It is actually brighter than any direct-view system.

The contrast has a dynamic range more than twice that of conventional projection systems.

## THE END OF BIG-SCREEN COMPROMISE.

Ambient light, one of the great problems in projection video, is no problem at all. In fact, there is less deterioration in contrast due to ambient light than in direct-view systems.

Focus, so much a problem in conventional projection systems, is sharp to the edges of the screen. Further, the picture is equally bright regardless of what angle you are viewing it from.

Blacks, so often grey on conventional systems, are rich while holding detail.

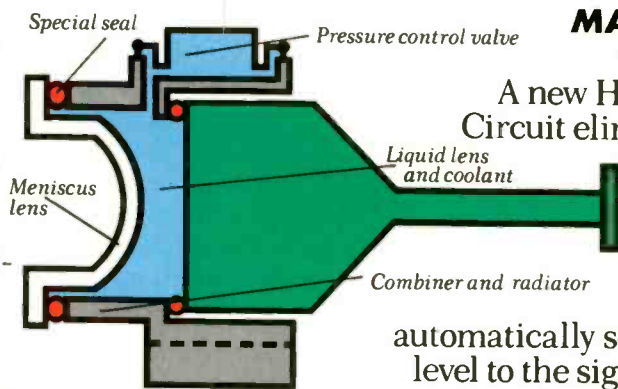
The fuzziness you're so used to seeing around white lettering and objects at high brightness, known as "blooming," is eliminated.

Color values are exceptionally accurate.

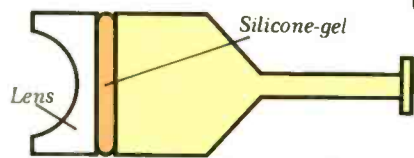
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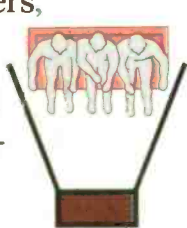
And new High-Focus CRTs utilize not one but three electron lenses. These, combined with a newly developed Linear Tracking Focus System, result in a focal performance superior to conventional CRTs.

## THE HEART OF A SOPHISTICATED AUDIO/VIDEO SYSTEM.

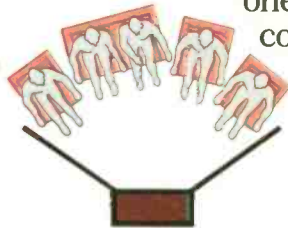
Inputs are provided for a LaserVision player

and two videocassette recorders, in addition to 139 cable-capable channels with 10-key direct access. There's an MTS decoder for stereo/SAP broadcasts, and a simulated-stereo processor. There's a built-in high-powered 12W + 12W amplifier, with two built-in 6<sup>5</sup>/<sub>16</sub>-inch speakers. There's a monitor output, and a TV output. There's even a variable audio output that lets you control volume through your hi-fi system by remote control.

In fact, the entire system is controlled by



**Conventional seating**



**Our seating**

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one 54-function System Remote control (which will also control Pioneer LaserDisc™ and VCRs bearing the SR symbol).

We could go on and on.

Suffice it to say, all you have to do is see the Pioneer SD-P40 once, and you will suddenly understand the difference

between the world of projection televisions and the only projection monitor in the world.

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PIONEER

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by Christie Barter  
& Steve Simels

**G**ETTING us off to a classy start, we find jazz great Miles Davis, caught during a recent appearance at the Bea-



EBET ROBERTS

Davis: blues with B.B.

con Theater in New York. The legendary Man with a Horn was participating in one of the least likely concert double-bills of recent memory, co-headlining with blues honcho B.B. King. Perhaps as a tribute, Miles featured a long, languorous, and moving slow blues as part of his set. Rumors that B.B. limbered up with a guitar version of *Birth of the Cool*, however, seem to have been unfounded.

Since our most recent review of a Davis album—last year's "You're Under Arrest" on Columbia—the trumpeter has gone over to Warner Bros. and is currently at work on his first album for that label with producer Tommy LiPuma.

Brown, Midnight, Hartman



EBET ROBERTS

Note: Davis appears in the anti-apartheid video "Sun City," taped in South Africa and recently released by Karl-Lorimar. □

**T**HE self-proclaimed Hardest Working Man in Show Business, James Brown, is pictured below doing something you don't see him doing very often: sitting down. Brown, currently riding high on the success of *Living in America*, from the *Rocky IV* soundtrack, was at the Greene Street Studios in New York working on a follow-up album with collaborators Charlie Midnight and Dan Hartman (of *Streets of Fire* and other fame). Brown watchers should also look for PolyGram's just-released "Thirty Golden Hits" album, a nicely chosen anthology of the great soul singer's overlooked mid-Seventies funk material. □

**T**AKE that, Jack LaLanne! Yes, those are everybody's favorite overweight rappers, the Fat Boys, cavorting at a recent New York performance of the Ringling Brothers Barnum & Bailey Circus. What the connection is we're not sure, but the Boys were participating in a benefit show for starving folks in the New York area, as well as picking up a Gold record (not shown) for their recent LP "The Fat Boys Are Back."

Coming soon: a long-form video in which the Fat Boys pay tribute to some of their role models, including Orson Welles, Kate Smith, Montserrat Caballé, and Divine. □

**A**MERICAN Pianist Jerome Rose, cited in Richard Freed's Liszt discography in this issue (page 89), is also the man behind an eight-day Franz Liszt Centennial Celebration being held in Washington, D.C., beginning June 22. Consisting of a series of concerts, lectures, and master classes presented by internationally known artists and scholars, the celebration ends on Sunday afternoon, June 29, with a concert at the Kennedy Center that will be broadcast live over the NPR network. Featured among the participating artists are pian-

ist Jorge Bolet, violinist Aaron Rosand, and baritone William Parker. □

**T**HE French pianist François-René Duchable is highly regarded in his native country as an interpreter of the works of Liszt. Up to now he has been known in North America for his recordings on the Erato label, but he is coming to the United States and Canada for a short concert tour this summer. His engagements include an appearance with the Montreal Symphony under Charles Dutoit on July 17. He will make his New York debut at Alice Tully Hall at Lincoln Center in October at another festival observing the hundredth anniversary of the death of Franz Liszt.

Duchable's Liszt recordings on Erato, distributed in this country by RCA Red Seal, include the two piano concertos with the London Philhar-



JACQUES SARRAT/RCA

Duchable: honoring Liszt

from the Forties and were used, according to the engineers, to give the music "a warmer sound."

"The Art of Excellence," the first album Bennett has recorded in nearly ten years, was released on Compact Disc in support of his dates at the Kennedy Center in Washington the first week in May. The LP and tape followed lat-



EBET ROBERTS

The Fat Boys at the circus in New York

monic Orchestra conducted by James Conlon and another disc containing the great Sonata in B Minor and other works. Coming later in the year is a real rarity: a transcription by Liszt of Berlioz's *Harold in Italy* for viola and piano. Duchable's partner on this one is the French violist Gerard Caussé. □

**M**OST of the tracks on Tony Bennett's new Columbia album, "The Art of Excellence," were digitally recorded at the Olympic Studios in London using state-of-the-art equipment—with one significant exception, in the audio chain's first link. The microphones were holdovers

er in the month when the singer was booked into New York's Radio City Music Hall. In any case, the Bennett album was the first that Columbia had yet released on CD ahead of the other two formats. □

**T**HE fastest-selling record in the history of Telarc is "Bachbusters," an album of Bach classics given an electronic working over by a man named Don Dorsey. Although our critic doesn't like it much (see review, page 99), a lot of people obviously do. "Bachbusters" has found an audience sufficient in numbers to put it (at press time) in the No. 2 spot on *Billboard's*





classical CD chart, giving the *Amadeus* soundtrack at No. 1 its first real challenge in months.

"Bachbusters" is Dorsey's first solo record. He is otherwise known as the synthesizer keyboardist who creates the electronic music for the dazzling spectacles staged at Disneyland and Walt Disney World. His previous work in the recording studio, however, includes collaborations on



Bennett: state of the art

albums by Quincy Jones, Donna Summer, James Ingram, and Sergio Mendes.

While he's cooking up ideas right now for another solo outing, Dorsey is quick to allay fears that the next one might be called "Handelbars."

**NOTED** California Girl Belinda Carlisle is looking considerably more sophisticated (and svelte) these days than she did as lead singer of the now-defunct Go-Go's. Her new look just happens to coincide with the forthcoming release of her first solo

Dorsey: Bachbusters, but no Handelbars



ADAM J. BEZARK/TELARC

album for I.R.S., an effort that all concerned are hoping will fare better commercially than the recent similar effort by her former colleague Jane Weidlin.

But why the image change for the former punkette? We don't know for sure, but it may have something to do with her recent marriage to one Morgan Mason, a former Reagan aide who also happens to be the son of the deceased English actor James Mason.

**T**WENTY-six-year-old violinist Cho-Liang ("Jimmy") Lin is an avid tennis player, we're told, but when he's not sweating it out on the courts this summer, he'll be shuttling between Mostly Mozart concerts at the Kennedy Center in Washington and Avery Fisher Hall in New York as well as fulfilling dates at Tanglewood (the Boston Symphony's holiday home in western Massachusetts), the Chicago Symphony's Ravinia Festival, and the Aspen Festival in the mountains of Colorado.

While at Tanglewood, Lin will also join string colleagues Isaac Stern, Yo-Yo Ma, Michael Tree, Jaime Laredo, and Matt Heimowitz in performances of the two Brahms sextets, which they will subsequently record for CBS Masterworks. Earlier this year, also for CBS, Lin recorded Bruch's G Minor Violin Concerto and *Scottish Fantasy*, with the Chicago Symphony under Leonard Slatkin, and Mozart's Violin Concertos Nos. 3 and 5, with Raymond Leppard and the English

Chamber Orchestra in London.

**N**EW recordings of two landmark Broadway musicals are currently in the news. New World Records has just released the first complete recording of Leonard Bernstein's *Candide* in the version that has proved so popular at the New York City Opera. Tenor David Eisler sings the title role, soprano Erie Mills is the less-than-innocent Cunegonde, and John Mauceri conducts. All three participated in City Opera's first performances of *Candide*, and Eisler and Mills will sing the leads again during the company's new season beginning July 1.



Carlisle: new look

CBS Masterworks recently recorded Rodgers and Hammerstein's *South Pacific*, for release later in the year, with Dame Kiri Te Kanawa, José Carreras, Sarah Vaughan, and Mandy Patinkin. Jonathan Tunick conducts the London Symphony and the Ambrosian Singers.

**G**RACENOTES: Add Russian-born pianist/conductor Vladimir Ashkenazy to the list of folks (including Michael Jackson and Hall

and Oates) who want the Rock 'n' Roll Hall of Fame and Museum to be quartered in Cleveland. "Why not?"



Lin and Slatkin

asked Ashkenazy in a recent speech to the Cleveland City Club. "Rock is an important part of your culture. It's important that it be recognized." . . . The latest madness from the folks at Reach-out International Records is a tape anthology of previously unreleased material by L.A. punk pioneers The Dickies. Titled "We Aren't the World," the tape includes such never-to-be-forgotten numbers as *You Drive Me Ape (You Big Gorilla)*, the theme from *Gigantor*, and a classic demolition job on the Moody Blues' *Nights in White Satin*. . . . Reasons to Be Cheerful #34: Journey's new album, "Raised on Radio," is the second major-label release this year without accompanying videos (the first was Van Halen's "5150"). . . . Maybe there's not as much of a generation gap as a lot of social scientists would have us believe. A recent demographic study has determined that the core of MOR warbler Barry Manilow's audience is twenty-two years old or younger. . . . At the far side of the generation gap (if there is one) are the musicians, most of them former opera stars, who have retired to the Casa Verdi in Milan, Italy. Casa Verdi is the subject of "Tosca's Kiss," a video recently released by Video Arts International, which has announced that 10 percent of its net profits on sales of the tape will go to the retirement home founded by Giuseppe Verdi shortly before his death in 1901.

JIM STEERE/AUDREY MICHAELS

I.R.S. RECORDS



At Home With The

# SANSUI SE-88 GRAPHIC EQUALIZER AND SPECTRUM ANALYZER



by Michael Smolen

**F**OR many years, in both home stereo and electronic-music recording situations, I have been an avid equalizer user. Some people I know would characterize me as a real freak—I'm constantly leaping across the room to nudge a 1,600- or 2,500-Hz slider until I think things sound just right. As this kind of action tends to annoy listening guests and studio clientele alike, I found the notion of a wireless remote-control equalizer to be highly intriguing.

Sansui's SE-88 is a fourteen-band graphic equalizer and spectrum analyzer that has been afforded the convenience of wireless remote control. Its black-finish metal chassis (not rack-mountable) measures 16<sup>5</sup>/<sub>16</sub> inches wide, 4<sup>3</sup>/<sub>8</sub> inches high, and 11<sup>1</sup>/<sub>16</sub> inches deep, and it weighs 9 pounds. On the front panel are a clear-plastic-covered display and a block of soft-touch control buttons. At first the control section appears to be part of the panel, but it can be tilted forward and removed for remote use.

The manufacturer's specifications for the SE-88 include a frequency response of 10 Hz to 100 kHz +1, -3 dB (EQ flat), total harmonic distortion of 0.008 percent (2 volts, 20 to 20,000 Hz), and a signal-

to-noise ratio of 110 dB (short-circuit, A-weighted).

The home system in which I used the SE-88 consists of a Soundcraftsmen MA-5002 power amplifier, a Soundcraftsmen PE-2217 preamplifier (its equalizer section, of course, was switched out), a Thorens TD-124 turntable with an SME tonearm and an Audio-Technica AT160ML cartridge, a Nikko NT-990 tuner, an Aiwa M800B cassette deck, a Teac A-2000 open-reel deck, and a pair of Klipsch Forté loudspeakers.

Besides modifying program sources to my own taste, I used the SE-88 to eliminate tuner- and tape-generated high-frequency hiss, to create a slightly exaggerated frequency response on my car-only cassettes, and for noise reduction during taping. Although there are some basic ground rules for using an equalizer, its overall use for sound modification is highly personal, and it would be foolish for *anyone* to prescribe a right and a wrong way of doing things.

Sound modification with the SE-88 is very easy. The equalizer section has fourteen center frequencies, at 25, 50, 100, 160, 250, 400, 630, 1,000, 1,600, 2,500, 4,000, 6,300, 10,000, and 20,000 Hz. Response

adjustments are made in 2-dB steps, and the control range at each center frequency is ±10 dB.

Once I chose the source I wanted to modify, I called up individual center frequencies from two rows of small buttons located across the top of the remote control. Each time I pressed one of the buttons I heard an electronic beep representing one note in a two-octave musical scale, and the corresponding bar on the graphic display began to flash. I made my adjustments by pushing the + or - button on the remote to boost or cut response in the selected band. It was as simple as that.

Although I was initially overwhelmed by the amount of information provided by the SE-88's display, it took only a couple of minutes to sift through it and figure out what was going on. The display can be set to show either the left or the right channel alone or both channels together. Response in each band can be adjusted the same way, either channel separately or both together. The display includes a switchable peak-hold feature for the analyzer mode.

Although the blue and red segmented bars in the display were well lit and easily seen from across my living room, the alphanumeric label

indicators were too small for comfortable reading at anything but a close distance. Reading the labels became less and less of a problem, however, as I became familiar with the SE-88's operating controls.

In a test that anyone can run at home, I used a Denon test CD to check the accuracy of the individual center frequencies and found them all to be right on the money. I also came to appreciate the SE-88's control over fourteen frequency bands as compared with the ten found on the Soundcraftsmen PE-2217. The Soundcraftsmen's specs are a little better than the Sansui's, but to me, the more control the merrier.

The SE-88's spectrum-analyzer display also divides the program source into fourteen frequency bands, which allowed me to visually confirm the frequency allocation of the program source and the amount of sound compensation I had selected with the equalizer controls. As much as I enjoyed the visual confirmation of what I was doing with the equalizer and the accuracy of the display, I feel that many manufacturers who include this exotic light show in their equalizer products may be misleading the consumer.

A true real-time spectrum analyzer (RTA) is used to equalize speaker systems by feeding pink noise into the signal path and observing the response at a room's prime listening area, as picked up by a microphone attached to the analyzer. Since most consumer spectrum analyzers, including the SE-88, do not include pink-noise generators, one-third-octave filter sections, and microphones, they are more or less just fancy, multicolored light shows.

*The Sansui SE-88's control section appears to be part of the front panel, but it can be tilted forward and removed for remote use.*

The SE-88's special equalizer functions include five memory presets into which I loaded five different equalization curves for different types of music (such as rock, classical, jazz, and New Age) from different sources (such as CD, tuner, cassette deck, and turntable). Other extras are a FLAT control, which instantly flattens the response for resetting or comparison to the un-

equalized source signal, and a REV(erse) control, which instantly reverses the EQ characteristics. The SE-88 also provides two tape loops for flat or modified recording on two separate decks; dubbing is possible in either direction.

It was with the REV(erse) control that I was able to create some semblance of noise reduction during taping. I created an equalization curve with raised high-frequency response, loaded the data into a memory preset, pressed the SE-88's REC(ord) switch, and dubbed an LP. I then played the tape back with the REV(erse) switch activated to produce response characteristics that were lowered at the high end, thus reducing the noise in that range. While this is not a perfect method of noise reduction, in a pinch it does an adequate job.

The true beauty of the SE-88's design lies in its remote control, so the last test I performed was to check out the remote's operating range, specified as roughly 20 feet within a 60-degree arc from the transmitting port. Although I'd be lying if I said my living room was 20 feet in *any* direction, I was able to confirm that the remote worked above and beyond its given specs.

It took me a very short amount of time to get used to the Sansui SE-88, and soon I was even using it to create curves that matched the characteristics of the various tapes I use and the particular program sources I record from. For everything that I used it for, the SE-88 performed smoothly, easily, and very accurately. At no time did I become aware of any noise being introduced into the signal path, something I cannot say for many of the multipurpose, megabuck signal processors I use both at home and in the studio.

In all, I found the Sansui SE-88 to be an excellent product and well worth its \$399 price. I would even recommend it to the first-time equalizer buyer, because despite its many features it is very easy to use and understand. And you know something? In a dark room, late at night, with Tangerine Dream's *Force Majeure* LP silently spinning on my turntable, I even came to enjoy the spectrum analyzer's colorful light show. □

*For more information about the Sansui SE-88, ask your audio dealer or write to Sansui Electronics Corp., Dept. SR, 1250 Valley Brook Ave., Lyndhurst, NJ 07071.*

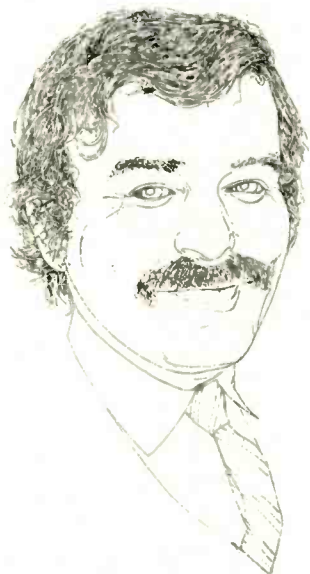
## ADVERTISERS' INDEX

READER SERVICE NO.	ADVERTISER	PAGE NUMBER
17	Altec Lansing	97
55	Alpine Elect. of America	98
20	Audio-Technica U.S., Inc.	108
23	Audio-Technica U.S., Inc.	108
	Boston Acoustics	1
33	Canton	10
49	Carver Corporation	22-23
	Columbia CD Club	21
	Columbia Video Club	19
11	Concord Electronics	127
68	Coustic	17
	Crutchfield Corp.	26
	DAK	12-13
	DAK	33
	DAK	39
	DAK	92
54	Dali	32
27	Denon America, Inc.	68-69
71	Discount Music Club	104
10	Discwasher	20
12	Epicure Products	129
21	Fujitsu Ten	11
	General Motors Corp.	34
	Harman America	43
13	Hitachi	74
	Illinois Audio	114
39	J&R Music World	109
	JBL	9
29	Kenwood Electronics	14-15
29	Kenwood Electronics	101
2	Klipsch & Associates	29
30	LaBelle Camera & Stereo	115
22	McIntosh Laboratory, Inc.	C2
55	Magnat Electronik, Inc.	27
	Marlboro	47
	Maxell Corp. of America	78-79
50	Mission Electronics	49
	Mitsubishi Electronics	65
	Mitsubishi Electronics	66-67
60	Pioneer Electronics	51
25	Pioneer Video	130-131
37	Polk Audio	6-7
	Proton Corporation	125
35	Pyle Industries	102
	Radio Shack	2
	RCA Compact Disc	31
	R. J. Reynolds-Winston	C3
41	Shure Bros.	100
62	Sony Audio	64
62	Sony Audio	75
62	Sony Audio	77
4	Soundcraftsmen	112
34	Stax	76
48	TDK Electronics	4
66	Teac Corp. of America	72-73
II	Technics	37
III	Technics	C4
	Telarc	102
	Telarc	103
	U.S. Army	95
	Wisconsin Discount Stereo	111
14	Yamaha International Corp.	44
14	Yamaha International Corp.	70-71

JULY



by Ralph Hodges



## Audiophile Listening

SOMETIMES I get the feeling that there is at best an uneasy truce between high-end audiophiles and the rest of the world. On most occasions, audiophiles who are not compulsively talkative about their consuming interest are accepted readily enough by other people as co-workers, spouses, and sometimes even friends. But there usually comes a moment in an acquaintanceship when the audiophile is fixed by the steely stare of the inquisitor and put to the question: What is this all about? Why are you spending all this money? What *is* it that you're listening for, anyway?

That last one is a very good question, and if I could be genuine to answer it, even only to my own satisfaction, I feel I could bring the world significantly closer to peace and mutual understanding. However, the answer eludes plain, direct English, and it is probably somewhat different for different audiophiles too.

When a neophyte hi-fi buyer, asking how he can identify the best speaker in the showroom, is told to listen for violins that have edge but not edginess, brass with bite but not overbearingness, and so on, he's being encouraged to adopt an analytical attitude toward listening, which should ultimately be all to the good.

But I don't think he's being told anything about how an experienced audiophile listens. The bite on brass is a relative thing, and sometimes violins *are* edgy.

The audiophile engaged in listening is immediately aware of such factors, no doubt, but doesn't normally pay conscious attention to them unless something is grotesquely wrong. Instead, he seems to soak up the whole sonic presentation, indiscriminately in some ways, and yet quite analytically on another level, and waits for an *emotional* response. Is this performance getting to me? Do I have the feeling I can get to *it* just by reaching out?

Not everyone, of course, is capable of a strong "gooseflesh" reaction to music re-created by a mere machine. Some have suggested that audiophiles react this way because we are actually *deficient* in hearing and are too easily fooled into satisfaction. Whatever. But here are some things that seem *not* to characterize audiophiles:

*Golden ears.* It appears that audiophiles score no better on audiometric tests than the general populace and can boast no special acuity. In fact, noted audio engineer and educator Don Davis, the best sound-system equalizer I've seen in action, admits to a severe 3-kHz notch in his hearing—the result of too much target shooting without earplugs.

*Perfect pitch.* I've enjoyed musical evenings with many people possessed of perfect pitch, but none has shown any interest in hi-fi other than to point out gleefully any speed drift in my turntable.

*Musical talent.* A number of talented musicians have become passionate audiophiles, but most audiophiles are, like myself, barely coordinated enough to handle a typewriter, much less a piano.

*Special gifts or curses.* There is, among the many mysteries of human hearing, a phenomenon called the "cocktail-party effect," which enables people to home in on and understand what the babysitter, for instance, is urgently trying to tell them from across the room, even when they're surrounded by boisterously loud revelers. I almost totally lack this ability, and among audiophiles I'm not alone in this. We hear

everything, all at once, whether we want to or not. Could this be why audiophiles have difficulty appreciating the soprano if the signal-to-noise ratio is poor? If so, we are bereft of an important survival trait and may die out. We'll die listening, though, voluntarily or not.

And here are some things that *do* seem to characterize audiophiles:

*Audio memory.* The ear has a notoriously fallible recollection for what it heard even a few seconds ago, we are told, and numerous scientifically devised tests continue to uphold this proposition. No true audiophile believes in it, however. Perhaps this is because audiophiles do bring close to their full concentration to the business of listening to music and can report on their experience afterward—often long afterward—in puzzlingly complete detail. Also, audiophiles trust, erroneously or not, their *emotional* reactions to a presentation of music and are confident that the same presentation, repeated later, will push the same emotional buttons in the cortex. In short, they consider audio memory a very valid tool and use it constantly.

*A/B tests.* Audiophiles pay little attention to these procedures, although they are often invited to participate in them. Switching from system A to system B at a millisecond's notice, and being challenged to describe the difference between them, doesn't do a thing for their interests or aspirations. They prefer to hear a whole work on system A, and then on system B, so that they can compare their emotional responses to the two presentations. And they're exactly right, when you think about it. There are moments in every serious piece of music in which system A, be it ever so good, and system B, be it ever so rotten, are going to sound virtually identical. There are also moments when they're going to sound very different. But moments mean nothing.

If a system can get from one end of an extended piece of music to the other and provide pleasure while doing so, audiophiles have found all they're looking for. But the evaluation of a system for this kind of capability requires patience, experience, and a tremendous interest in music. □



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