

Stereo Review

APRIL 1987 ● \$2.25

VIDEO SPECIALS:
HOW TO USE A VCR
SURROUND SOUND
A BUYING GUIDE
TO HI-FI VCR'S

LAB TESTS:
MARANTZ CD PLAYER
PIONEER PREAMP
SNELL SPEAKERS

FIRST TESTS:
BOSE AM-5
SPEAKERS





'Knew you'd be a vision in white
How'd you get these pants so tight?
Don't know what you're doin'
But you must be livin' right
We got some places to see
I brought all the maps with me
So jump right in...Ain't no sin
Take a ride in my machine
City traffic movin' way too slow
Drop the pedal and go...go...go
Go'n' ridin' on the freeway of love
Wind's against our back
Go'n' ridin' on the freeway of love
In my pink Cadillac

FREEWAY OF LOVE
Aretha Franklin

MAXELL. THE TAPE THAT LASTS AS LONG AS THE LEGEND.

She's traveled the highway from gospel singing sister to the reigning Queen of Soul. Fueled by a big powerful voice and a big joyous heart. Maxell audio tapes are created so that you can have a permanent record of that long journey, now and in the years to come. At Maxell every tape is manufactured to standards 60% higher than the industry calls for. So even after 500 plays the genius that is Aretha will still thrill you just like it did when you first heard it, tooling down your very own freeway of love.



by *Christie Barter and William Burton*



NEW AUDIO/VIDEO

Philips is spearheading the launch of a form of CD-videodisc similar to Pioneer's. The new product, which Philips calls Compact Disc Video, will be released in three formats, however—as five-inch “singles,” eight-inch “EP’s,” and twelve-inch “LP’s.” Due to be introduced at the Summer Consumer Electronics Show in Chicago, the singles will carry about five minutes of video and some twenty minutes of music with (according to one announcement) a suggested list price of between \$5 and \$6. The twelve-inch CDV will be comparable to Pioneer's Compact Laser Discs, which retail for \$16.95. The hardware to play the new CDV's will be manufactured by Philips and other companies, under license, and will range from portable singles players to CDV-equipped television monitors.

HONORS AND AWARDS

Whitney Houston was the decided front runner at this year's American Music Awards ceremony in Los Angeles. The twenty-three-year-old singer took prizes for favorite album (her debut on Arista) and favorite female vocalist in both the pop/rock and soul/r-&b categories as well as for favorite r-&b video single. . . . Anita Baker has won two NAACP awards, for Best Album (“Rapture,” her debut on Elektra) and Best Female Artist. . . . John Denver has received this year's Yamaha Music Award for his “ongoing dedication to excellence in music.”

MUSIC VIDEO FOR EASTER

MGM/UA Home Video has released the Academy Award winning Irving Berlin musical *Easter Parade*, starring Judy Garland and Fred Astaire. With an approximate screening time of an hour and forty-five minutes, and a soundtrack that's been “digitally enhanced for stereo,” it's a bargain at the list price of \$29.95.

COPY-PROOF MUSIC?

A double-ended copy-guard system developed by CBS could soon make it impossible to dub encoded music with tape recorders containing a complementary detector chip. The system prevents duplication of encoded sources (such as the twenty encoded CD's of Barbra Streisand's “Broadway Album” pressed for demonstration purposes) by any tape deck—analogue or digital—that has the detector chip. CBS expects to distribute ninety coding machines to record companies for production runs in June, so encoded CD's, LP's, and cassettes could be in record stores in July.

The encoding consists of an intermittent notch centered at 3,838 Hz, about 90 dB down and 125 Hz wide. CBS claims the absence of these frequencies is not noticeable. According to Denon engineers, the effects of the pre-production encoder are audible in classical music but not in popular music.

A law now before Congress (S. 506) would encourage DAT manufacturers to build the copy-guard chip into their decks, thus making them incapable of copying encoded material. The technique could be applied to any format containing audio frequencies around 3,838 Hz, including videotapes and radio and TV broadcasts.

SUPER-VHS DETAILS

JVC is claiming that its Super-VHS system can record and play videotapes with higher resolution than either videodiscs or broadcasts. Demonstration models were rated at 430 lines in SP and EP speeds. To achieve this sharpness, S-VHS VCR's must use special blank S-VHS videotapes. An S-VHS tape cannot be played on a standard VHS deck, although an S-VHS deck can play standard VHS tapes. S-VHS is said to work by separating the chrominance and luminance signals to reduce video noise.

78'S LIVE!

Rhino Records has revived the ten-inch 78-rpm record in a twenty-five-disc set of “Jukebox Clas-

sics,” featuring fifty 1950's hits such as Jerry Lee Lewis's *Whole Lotta Shakin' Goin' On* and the Chordettes' *Mr. Sandman*. According to Rhino, this is the first time records have been released in this format since 1959.

MUSIC VIDEO CATALOG

Playings Hard to Get is the name of a mail-order service devoted solely to music video. The catalog, which is updated irregularly during the year, lists music-video software in all categories, from shorts to feature films in all formats. It is available for a one-time fee of \$2, payable to Playings Hard to Get, 580 Old Mine Office, Madrid, NM 87010.

DAT DECK ON SALE IN JAPAN

As we went to press, Aiwa announced that it was putting a digital audio tape (DAT) deck on the market in Japan. See report on page 18.

KIDDIE KAMCORDER

A camcorder capable of recording eleven minutes of black-and-white video with mono sound on C-90 audio cassettes is being introduced by toy manufacturer Fisher-Price. Weighing less than two pounds, the PXL 2000 should have a suggested retail price of \$150 or less. For playback, the camcorder connects directly to a TV set. Instead of using rotating heads like all other camcorders, the PXL 2000 records the video and audio signals with a stationary head as the tape moves at a speed equivalent to fast forward in audio use. Each side of a high-bias C-90 can be used for five-and-a-half minutes.



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Stereo Review

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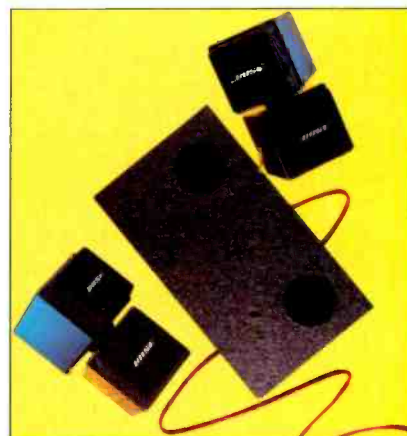
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Cover: The Bose AM-5 satellite/subwoofer speaker system; see page 62 for a special test report by Julian Hirsch. Design by Sue Llewellyn. photo by Robert Lorenz.

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Stereo Review Magazine

Matthew Polk's magnificent sounding new 3rd generation SDA 2A incorporates many new advances pioneered in his top-of-the-line Signature Edition SRSs. It achieves stunningly life-like musical reproduction which would be remarkable at any price but is simply extraordinary at \$499. each. Stereo Review said, "listen at your own risk." Once you hear them you'll never be satisfied with anything else!

Polk's Revolutionary True Stereo SDA Breakthrough

The magnificent sounding new SDA 2A incorporates Polk's revolutionary True Stereo SDA technology. This patented, critically acclaimed, Audio Video Grand Prix Award winning breakthrough is the most important fundamental advance in loudspeaker technology since stereo itself. In fact, the design principles embodied in the SDAs make them the world's first and only True Stereo speakers.

Why do Polk SDAs always sound better than conventional speakers? When conventional loudspeakers are used to reproduce stereo both speakers are heard by both ears causing a form of acoustic distortion called interaural crosstalk which cuts down stereo separation, obscures detail and interferes with the proper reproduction and perception of imaging, and spaciousness. Polk SDAs are designed to eliminate interaural crosstalk so that each speaker is only heard by the one correct ear (i.e. left channel/left ear, right channel/right ear), like headphones. The result is dramatically improved stereo separation, detail and three-dimensional imaging. In order to accomplish this each SDA incorporates a separate set of drivers which radiates a special dimensional (difference) signal which cancels the undesirable interaural crosstalk coming from the wrong speaker to the wrong ear. High Fidelity called the results "Mind Boggling".

The Most Extraordinary Value in High End Audio Today

The new SDA 2As, like all the current SDAs, incorporate the latest 3rd generation SDA technology developed for Matthew Polk's Signature Edition SRS and SRS-2 including **1:** full complement sub-bass drive for deeper, fuller, tighter and more dynamic bass response; **2:** phase coherent time-compensated driver alignment for better focus, lower-coloration smoother, clearer, more coherent midrange and improved front-to-back depth and; **3:** bandwidth-optimized dimensional signal for smoother high-end and even better soundstage and image. The new SDA 2A is the finest sounding and most technologically advanced speaker ever produced at its extraordinarily modest price. It sounds dramatically better than speakers from other manufacturers that cost 4 times as much and more and is, at \$499 ea., truly the speaker of your dreams at a price you can afford.

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Stereo Buyers Guide

The spectacular sonic benefits of SDA technology are dramatic and easily heard by virtually anyone. Reviewers, critical listeners and novices alike are overwhelmed by the magnitude of the sonic improvement achieved by Polk's SDA technology. Stereo Review said, "These speakers *always* sounded different from conventional speakers — and, in our view, better — as a result of their SDA design."

All Polk's SDAs, including the new 2As produce a huge lifelike three dimensional sonic image which will amaze you. You will hear for the first time instruments, ambience and subtle musical nuances which are present on your recordings but masked by the interaural crosstalk distortion produced by conventional speakers. Stereo Review said, "Spectacular...literally a new dimension in the sound...the result is

always better than would be achieved by conventional speakers". High Fidelity said, "Mind Boggling...Astounding... Flabbergasting...we have yet to hear any stereo program that doesn't benefit". With SDAs every instrument, vocalist

"Mindboggling, Astounding, Flabbergasting"

High Fidelity Magazine

and sound becomes distinct, tangible and alive; allowing you to experience the spine tingling excitement, majesty and pleasure of live music in your own home.

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High Fidelity

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CIRCLE NO. 37 ON READER SERVICE CARD

SPEAKING MY PIECE

by William Livingstone



My Ambition

LIKE most people, I never got to decide what I was going to be when I grew up. An energetic niece of mine used to say she wanted to be a nurse. Her less energetic younger sister's ambition was to be a patient. Today, the would-be nurse is an advertising space buyer; the would-be patient is a mother and homemaker.

A prominent American opera singer used to suffer so badly from stage fright that she gave all her best performances at rehearsals. She was so frightened of audiences that her secretary said the singer's ambition was to be a great retired prima donna and go to the Metropolitan when other divas were singing.

When I dropped out of graduate school at the University of Copenhagen, where I was studying Turkic linguistics, I didn't know what to do next, so when I got back to New York, I took the first job that was offered to me: staff editor at the *Encyclopedia Americana*. I wanted time to think, and for a while I dined out on the fact that I hadn't decided what to be when I grew up. After eight years of editing encyclopedias, I came to work for STEREO REVIEW, still undecided.

On December 1, 1986, I cele-

brated the thirtieth anniversary of my entry into publishing in New York. My decision has been a long time coming, but I have finally made up my mind. What I want to be is a great retired editor and read magazines produced by others.

Friends ask me how I can think of giving up this magazine when it is so successful. It looks great, the readers seem happy with it, and so do the advertisers. I reply that it is axiomatic in show business to leave the stage while the audience is still applauding and calling for encores.

We've never had a better editorial staff than we do right now, and I can turn the magazine over to them with confidence and a clear conscience. Louise Boundas, the Managing Editor, who has been my close associate for nearly fifteen years, will take over as Editor in Chief with the May issue, and at that time Senior Editor Michael Smolen will become Executive Editor.

Like older executives in Japan who move from day-to-day operations to the policy-making level of their companies, I will become a consultant with the title Editor at Large. That means I will have time to play a little more with the equipment, listen to more records, and write more articles. I can comfort the staff if things go wrong and advise them if they wish.

Young editors I've trained have told me that I have all the controlling, manipulative traits of the stage mother portrayed by Ethel Merman in *Gypsy*. As I've grown older people have said I look more and more like the English character actor Alec Guinness. So I am now moving from center stage into the wings, where from time to time, like Merman, I will be heard to say, "Sing out, Louise!" At other times, like Guinness as Obi-Wan Kenobi in *Star Wars*, I'll call out, "Use the Force, Michael! Use the Force!"

And now, although our revels are not ended, I should like to thank you readers for twenty-two eventful years. If you read this magazine, you must be people who, like me, turn to music not just for entertainment, but for contact with beauty, for spiritual nourishment from a higher power. May that Force be with you always. □

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Artistry In Sound

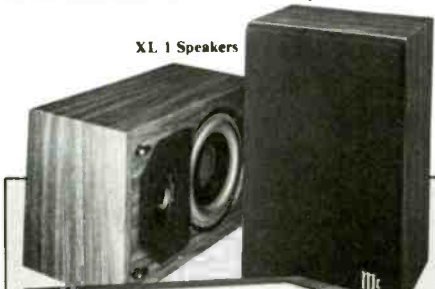
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LETTERS

Amp Tests: More Fallout

You sick Commie, Pinko perverts! Don't you realize that the very basis of our free-enterprise system is more product for more money? Here I am, enjoying my Julius Futterman OTL-1 on a rainy winter's night (the Futterman keeps my home a cozy 75° all winter), and you tell me subjects in a double-blind study couldn't discriminate between the audiophile trappings of capitalistic success and mere proletarian expediency.

What next? Will you prove that a Ford Escort can take people the same places a Mercedes 500 SEL can go? Does William Livingstone epitomize masochistic self-destructiveness, or what? Who would want to advertise a high-end unit in a magazine that espouses product equivalency? Or does Livingstone want us to forget about advertising entirely and all troop to state-run hi-fi stores to purchase identical amplifiers? Will the brand name be "Comrade-Johnson"?

Shouldn't certain research be suppressed for the sake of what we love and believe in? Think about it.

MARTIN H. WILLIAMS
Santa Clara, CA

We thought about it. And as the New York Times reported on February 1, 1987, "Stereo Review published these findings without flinching, and audio fans everywhere are bracing for the fallout."

First, let me thank STEREO REVIEW from the bottom of my heart and wallet for publishing "Do All Amplifiers Sound the Same?" in the January issue. This is just the kind of real, *pertinent*, *useful* information we audiophiles need, not the subjective, voodoo babble that most audio magazines publish. Thank you, thank you.

There are, however, two differences between amplifiers that I would be interested in seeing investigated. The first is power—this definitely makes an audible difference! There must be some *real* way to measure power. A 90-watt-per-channel Crown amplifier is loud; a 200-watt-per-channel Carver is not. Can't this be quantified?

The second is frequency response. I believe that I can hear a difference between systems with responses above 20,000 Hz vs. those with lower cutoffs. I have three hypotheses for this:

1) I have an auditory system that can hear frequencies greater than 20,000 Hz. This makes no sense, as little if any program material has any frequency information above this frequency.

2) I can hear the phase distortion, which becomes substantial well before

the cutoff frequency. This is possible, though experiments tend to indicate that humans are not sensitive to phase information. But experiments can be misleading.

3) I am imagining that I hear a difference. Very possible.

ALAN M. COHEN
Billerica, MA

I couldn't believe my ears, er, ah, eyes! You folks must be gluttons for punishment, or at least ridicule! First there was the revealing double-blind test of selected compact disc players and now the same kind of listening test of amplifiers. As you know, the results of the CD player test were a bitter pill for the well-heeled golden ears to swallow. The results of the amplifier test may be impossible for them to accept.

But I am one average audiophile who certainly appreciates your clarity, objectivity, and, dare I suggest, honesty. Thank you for being willing to speak the truth even when it hurts some ears—and not by distortion, either! (I can't wait for the promised report examining the audibility of distortion.)

ROBERT C. OATES
Brewton, AL

I found January's "Do All Amplifiers Sound the Same?" very interesting.

One question still remains, however. Was the Pioneer receiver used as is, or was its front end bypassed and the program passed through the Audio Research SP-11 tube preamplifier? If the former, then the results are even more startling.

JOE M. HOULAHAN
Almonte, Ontario

David L. Clark, who conducted the tests on which Ian Masters reported, informs us that the output from the Audio Research preamplifier was connected to the auxiliary input of the Pioneer SX-1500 receiver. Although the tone and balance controls on the Pioneer were set to their flat positions, the program signal did, indeed, pass through the receiver's preamplifier circuitry.

You are to be commended for "Do All Amplifiers Sound the Same?" I think, however, that since electrostatic speakers are somewhat deficient in bass, Magnepan MG-IIIa's should not have been the only speakers employed in the test. David L. Clark should have used another pair of speakers, preferably acoustic-suspension models, which would have allowed a comparison of the amplifiers in the low-bass region. The use of the Sota Star Sapphire turntable should have precluded any vibration problems.

In any event, I believe that the pream-



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This reaction, while somewhat understandable, never ceases to amaze the 326 car stereo engineers who work for Blaupunkt in Hildesheim, West Germany.

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Keep this in mind, and it's easy to appreciate the difference between Blaupunkt and other leading brands.

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While other car stereo makers are content to purchase tape mechanisms, amplifiers, tuners, speaker components, and other vital equipment from outside sources, Blaupunkt

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Which makes it all the more remarkable that the design stage is only the first step in making a Blaupunkt.

Now comes the hard part.

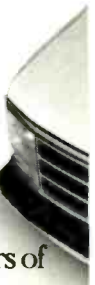
Tuners are taken from mountain ranges to bustling urban areas to measure radio reception.

Antennas spend weeks in salt baths in order to measure rust resistance.

Literally hundreds of tests are conducted.

To ensure performance at 160°F above zero.

To ensure performance at 5°F below zero. To ensure performance after 24 hours of



The Blaupunkt Lexington SQR 46. Complex audio technology engineered to be simple.

They prefer to take a more intelligent approach.

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Blaupunkt might be the only car stereo company that thoroughly understands this simple fact:

A car is a horrible place in which to reproduce true high-fidelity sound.

It requires an incredible effort to overcome challenges like road noise and vibration. Shrill glass surfaces. Cushiony seats. Bad reception. Temperature variations. And the obvious principle that a driver has better things to do than to

engineers do almost everything from scratch.

To pack more technology into a smaller space, Blaupunkt engineers design their very own circuitry

Controls are designed to ensure ease of operation even while wearing racing gloves.



The mountains of Europe are just one of the obstacles Blaupunkt engineers have had to overcome to improve radio reception.

punishing vibrations.

Last year alone, Blaupunkt engineers spent hundreds of thousands of hours testing.

And once a new model is approved for production, you might imagine that Blaupunkt

to up to 400 additional tests.

Why do we do it?

If you're a rational person, you almost begin to wonder why on earth Blaupunkt goes to such incredible lengths.

Perhaps because customers

brings you up-to-the-minute traffic reports in many major U.S. cities. And it's a standard feature in most new Blaupunkt receivers.

A thank you. And an invitation.

While we appreciate this opportunity to explain how well Blaupunkts are built, we are regretfully unable to demonstrate how good they sound.

For that, we invite you to visit the independent car stereo specialist near you who sells, services, and installs our products.

Check your Yellow Pages under "Automobile Radios & Stereo Systems."

Or call 1-800-237-7999, and we'll be happy to direct you.

Because frankly, while you may be surprised by how much goes into a Blaupunkt, you'll be even more amazed by what comes out.

Standard in VW and BMW (Europe), and worldwide in Ferrari, Porsche, and Audi.

engineers might relax a bit.

Wrong.

Every individual component is tested before assembly.

Then tested again during assembly.

Then the finished product is placed on a computer stand and tested before shipping.

But even that isn't enough.

Spot checks at random during assembly subject units

have come to expect it.

Customers like you.

And customers like Lotus. Porsche. Audi. Rolls-Royce. Aston-Martin. Ferrari. Just to name a few.

But a more important reason is simply because that's the way they do things over in Hildesheim, West Germany.

Since 1932, when Blaupunkt introduced the first car radio to

Europe, Blaupunkt has been obsessed with automotive sound.

It's hard to argue with the results.

Over the years, Blaupunkt has earned hundreds of patents in the field of automotive sound.

Example: ARI, a remarkable technology that

Why do Blaupunkt products perform so superbly? They're designed to work together. We engineer everything ourselves. Most manufacturers don't.

CIRCLE NO. 67 ON READER SERVICE CARD

Blaupunkt technicians in specially equipped vans cover the globe to test products.



BLAUPUNKT

BOSCH Group

LETTERS

plifier is the component that makes the real difference in sound. I wonder if this is the real basis behind the belief that amplifiers sound different.

MACON STEPHENSON
Richmond, VA

David L. Clark replies: First, the Magnepan speakers are not electrostatics but

planar magnetics with ribbon tweeters. Second, in the room we used for the listening tests, I have measured the response of the Magnepans as flat down to 35 Hz, which is hardly "deficient in bass." I find them to be very revealing speakers.

My reaction to your article "Do All

Amplifiers Sound the Same?" is outrage. For shame!

How could anyone with the slightest understanding of amplifier-speaker interaction use an OTL-1 with low-impedance speakers like the Magnepans? The "test" was not about sound quality but rather dealt with amplifier drive. You cannot just pull a number of amplifiers off the shelf on the basis of price and compare them in a speaker-cable system. If you wanted to compare a tube amplifier suitable for the Maggies, then Mono Quicksilvers at about \$1,300 a pair should have been used.

No wonder I canceled my subscription to STEREO REVIEW.

FABIAN SUNBERG
Maplewood, NJ

As we said in January, the truth angers those whom it does not convince. And if you canceled your subscription, how did you find out about this article? —Ed.

Oh, brother! One more time with the great debate between the golden ears and the statisticians. The issue is no better defined with respect to amplifiers than it was with esoteric loudspeaker cable, although speaker cable is infinitely easier and cheaper to experiment with (and I thought the esoteric cable was worth the forty bucks I spent).

It is helpful to remember, however, the inevitable leaps of (non)logic that some folks take. When I managed a stereo store several years ago, a young fellow with car speaker problems came in with his equipment in hand. Noticing, among other things, that he had wired his system with what appeared to be 28-gauge single-strand wire, I suggested that he switch to 18-gauge zip cord. He looked at me as if I were certainly the most ignorant man on the planet and sniffed, "STEREO REVIEW says it doesn't matter what kind of wire you use."

GLENN DRINKWATER
Chattanooga, TN

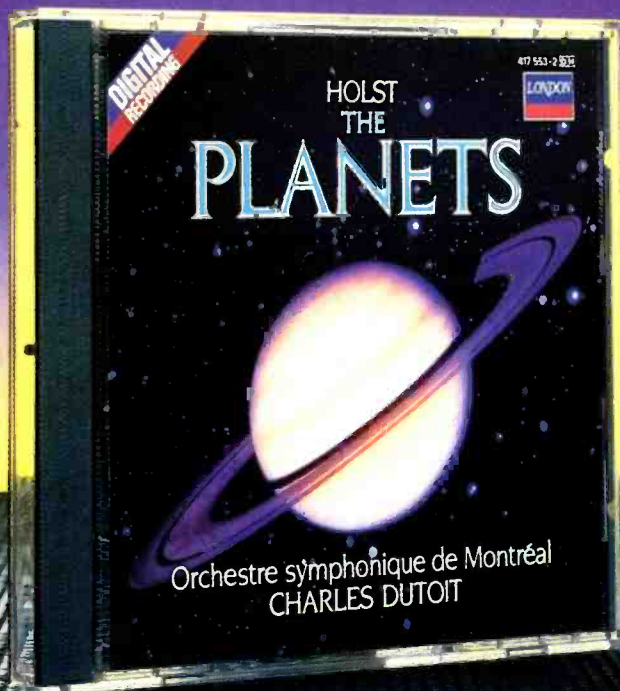
First it was cables, then CD players, now amplifiers. STEREO REVIEW says they all sound the same. I should have known—I've been subscribing for five years and never saw a product you didn't like. Even with my tin ears I can tell the difference between different CD players and amplifiers. I know you don't care, but I'll never subscribe again. There's no need—everything sounds the same.

BILL BRENNAN
Atlantic City, NJ

The Video Debate

Reader Gerry Smerchanski (February "Letters") is correct about how good

REACH THE SONIC LIMIT



LONDON

London compact discs... where listening is a musical sensation!

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The System...

The components you see were designed for the perfectionist who desires remote accessibility and uncompromised performance.

They are not inexpensive.

They are the finest we can make...

which means they are the finest *you* can own.

Each epitomizes its genre.

Each attains the pinnacle of perfection.

If you are in a position to invest in the finest in music reproduction,

consider the Nakamichi Series-7 System...

PA-7 STASIS Power Amplifier, ST-7 AM/FM-Stereo Tuner, CR-7A Discrete Head Cassette Deck, OMS-7AII CD Player, and

the CA-7A Control Amplifier...arguably,

the most sophisticated preamplifier conceived by man.

You may audition Nakamichi Series-7 Components at your nearby Nakamichi dealer.



CIRCLE NO. 74 ON READER SERVICE CARD

LETTERS

music sounds in a dark, noiseless room. I enjoy listening that way also. But a very high-quality video soundtrack is also very exciting. Doesn't Mr. Smerchanski go to big, full-sound movie theaters? They're great! And so can your home be now with the latest in surround-sound decoders. Keep up the excellent work STEREO REVIEW has been doing in both audio and video equipment reviews.

VICTOR HARO
Westchester, CA

You are absolutely correct in including video coverage in your magazine. I enjoy opera and have collected forty hi-fi stereo opera videotapes that I play through my component system. Perhaps Bach and Sibelius are best listened to with no distractions, but Verdi and Puccini are vastly more effective when you can see the performance. Video magazines tell you about picture quality but very little about sound, so please keep me informed about new video music productions.

MARY HEALEY
Arlington, VA

Mingus's Tijuana Takes

As the album's producer, I appreciate Chris Albertson's thoughtful review of Charles Mingus's "New Tijuana Moods" in the February issue, but I would like to correct one important factual error the review suggests. Referring to the LP version's second disc, Mr. Albertson states that what it contains are "... perhaps not true alternate takes but rather the same takes with cuts restored." In fact, these are entirely different takes, with wholly different solos and ensembles. There is a small transitional passage, consisting of approximately four and a half bars, that is common to both discs, but otherwise the two are completely different.

EDWARD MICHEL
Producer, RCA Records
New York, NY

That's Entertainment

I was alarmed to read in the January "Letters" that it is your policy to produce "a varied, informative column that will be fun to read." Varied and

informative, yes, but "fun to read"? I am surprised that you even admit this.

Please do not try to entertain me. Far too much public discourse in North America has been subverted by this compulsion to entertain. You do a good job discussing both the software and the hardware of entertainment. If you are just trying to be fun, however, nothing you say is of any more value than a cat-food commercial.

GREGORY A. HILL
Montebello, Quebec

We're not JUST trying to be fun, but, as stated, we try to make the "Letters" column fun to read as well as being varied and informative. Thanks for helping with your funny letter. —Ed.

Erratum

In "Twelve Tips on Choosing a Tape Deck" in the March issue, the price for Harman Kardon's TD302 cassette deck was incorrectly given as \$245. The suggested retail price is \$435. We regret any inconvenience this error may have caused.

Our lightest audio component. Until you plug it in.



At less than 6 ounces, our new YHD-1 stereo headphones won't weigh you down. Plug them in, though, and the sound is anything but lightweight.

Their exclusive Orthodynamic design allows full-surface linear motion of the lightweight diaphragm drivers. So the music sounds more open and spacious with improved high-frequency response. And exceptionally low distortion. Even at high sound pressure levels.

The ergonomic design of the YHD-1 headphones allows them to be worn for hours without listener fatigue. The fact that they look so good doesn't hurt either.

And the included mini-plug adaptor lets you use the YHD-1 headphones with your portable stereo components. So no matter what you plug them into, you'll always get heavyweight sound.

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



CIRCLE NO. 14 ON READER SERVICE CARD



Find out in *Stereo Review*.

Subscribing to *Stereo Review* makes sense. Whether you're shopping for your first stereo system, upgrading your present one, looking for maintenance tips or trying to sort through the hundreds of new recordings released every month, *Stereo Review* has answers you can rely on.

Our world-famous Equipment Test Reports help you select new audio equipment. Explanations of features, laboratory test results and comments from our expert technicians make it easy for you to select components for a great audio system.

If you already have a terrific sound system, *Stereo Review* can help you care for it and upgrade it. With hints on getting four-channel sound from your stereo discs...how to care for your tape deck's heads...how to handle records to preserve them...and much more.

Stereo Review also helps you select the music to play over your sound system. We cover every category of recording on disc or tape, to help you steer away from uninspired performances or mediocre recordings.

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RECOG

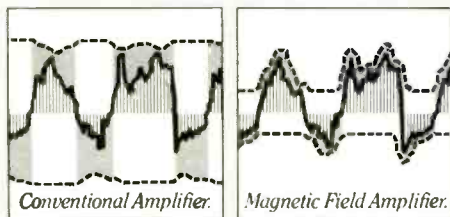
Why the Carver M-500t Magnetic Field Power Amplifier has helped begin an industry trend and how it has stayed ahead of its inspired imitators.



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 ± 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.

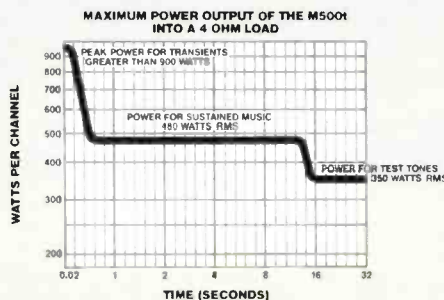
POWER EXPRESSED BY THE DEMANDS OF MUSIC.

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

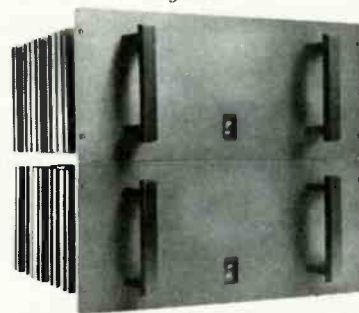
RMS of long term power for demands lasting up to several seconds. The M-500t provides more power, more current and more voltage than any comparably priced amplifier ever offered.

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 ± 50 amperes.

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

DEFINITION.

Figure 2 also shows the patented Magnetic Field Coil employed in the Carver M-500t. Its output current is ± 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.

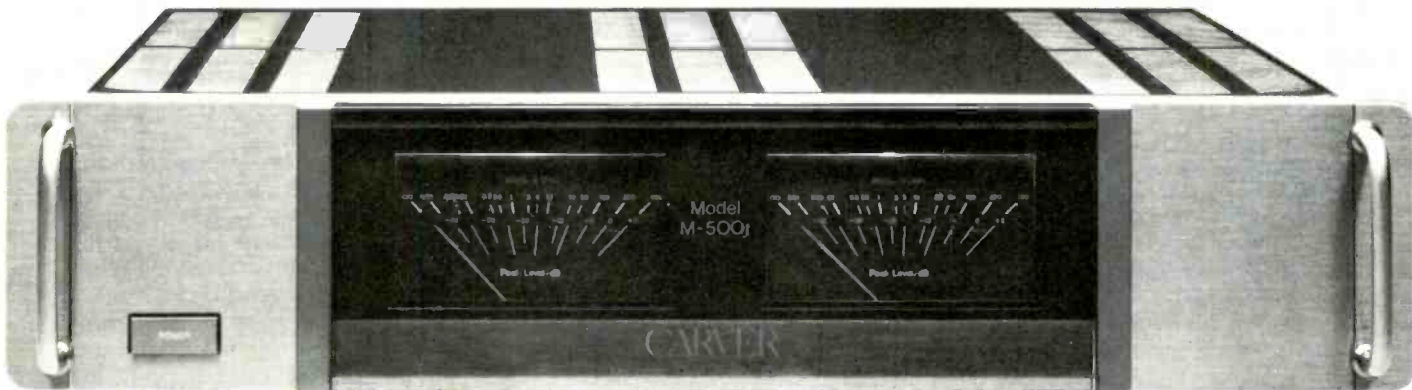
It means a veil is lifted between you and your musical source as the most detailed nuances are revealed with realism, believability and delivered with stunning impact.

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, ± 0.3 dB 1Hz- 100kHz. Slew Factor, 200. Weight, 25 lb. Finish, light brushed anthracite, baked enamel, black anodized.



CARVER

POWERFUL

MUSICAL

ACCURATE

DAT FINALLY RELEASED

REPORTED BY BRYAN HARRELL

TOKYO, Feb. 12—Audio history was made today at the Tokyo headquarters of Aiwa Co., Ltd., as it became the first manufacturer to officially announce for sale the controversial DAT (digital audio tape) recorder. Aiwa's XD-001 DAT deck will go on sale in Japan only on March 2, at a suggested retail price of 188,000 yen (about \$1,225). Aiwa will also release two lengths of DAT blank tape: 120 minutes (2,000 yen, or about \$13) and 60 minutes (1,400 yen, or about \$9). The XD-001 is the first component in Aiwa's new Excelia series, now being planned, which will consist of digital and digital-compatible audio components.

Several groups of reporters gathered on the first floor of Aiwa's new headquarters, a white building, scarcely open a month, that looks out over Tokyo's Ueno Park. There were no surprised looks on the faces of the reporters as they listened to the XD-001, which looks and sounds nearly identical to a standard home CD player. (Ironically, Aiwa auditioned the XD-001 through a pair of U.S.-made Westlake Audio BBSM-12F Reference Monitor speakers.) But unlike the usual press conferences of this type, the room came alive as reporters competed to ask questions after the demonstration was over.

In his opening message, Aiwa president Heitaro Nakajima acknowledged the *chossaken* (copyright) controversy, but he affirmed that nothing should keep this new technology from users. When he was asked why other manufacturers have yet to release DAT equipment, Nakajima seemed puzzled, revealing that MITI (the Japanese Ministry of Trade and Industry) gave manufacturers the go-ahead for a February release of DAT.

Why Aiwa was first with DAT has stumped many industry observers, who expected Sony to be the first with DAT as it was with CD. But Aiwa and Sony share a relatively close relationship. Sony holds a



Aiwa's Excelia XD-001 DAT (digital audio tape) deck

controlling interest in Aiwa, which, interestingly, carries only 8mm and Beta-format products in its video line. And Nakajima, a key DAT personality, came to Aiwa four years ago from Sony. He is chairman of the industry-wide DAT standards committee, and he was also one of the leading figures in the commercialization of the compact disc format during the latter part of his long career with Sony.

In appearance, Aiwa's sleek, black



The DAT cassette is about half the size of a conventional analog tape cassette.

XD-001 DAT cassette deck looks much like any compact disc player, but it is said to be capable of marginally superior sound reproduction. Aiwa claims a frequency response up to 22 kHz, a dynamic range of 99 dB, and instrument-boggling figures of 0.005 percent for total harmonic distortion and 0.001 percent for wow-and-flutter.

Perhaps the most interesting aspect is the XD-001's capability of handling three different digital sampling frequencies, a standard feature of the DAT format. Playback is possible not only at the deck's main sampling frequency of 48 kHz, but also at 44.1 kHz, the standard for

the compact disc, and at 32 kHz, the anticipated standard for future digital satellite broadcasts.

But the major controversy surrounding the release of DAT equipment has centered on its recording capabilities, especially the possibility that users could make direct digital copies of compact discs that are currently without "copy prevention" codes. The XD-001 is incapable of dubbing CD's digitally, however, since it cannot record at the CD's 44.1-kHz sampling frequency even if a direct digital output signal from a CD player is fed through the deck's rear-panel digital input. And for the future, the XD-001 will also not be able to make direct digital copies of certain 48-kHz and 32-kHz recordings, which are expected to incorporate copy-prevention codes. If it detects such a code, the tape will not run and a "copy prohibit" LED in the XD-001's display will start flashing.

Nevertheless, direct digital-to-digital copying from another DAT deck is possible, resulting in copies of virtually the same quality as the original. To really drive this point home at the demonstration, a 250th-generation copy was compared with the original DAT tape. Nobody seemed surprised that the copy was indistinguishable from the original—but some were astonished that Aiwa went to the trouble to copy a tape 250 times!

Other circuit details of the XD-
(Continued on page 114)

CAR AUDIO TODAY

BULLETIN NO. 2

IT'S NOT HOW EASY IT IS TO TAKE OUT. IT'S HOW IT SOUNDS WHEN YOU PUT IT BACK IN.

A few years ago, the car audio industry saw its first removable radio system. And while, since then, several autosound manufacturers have come along with their own versions, Alpine has taken the slower course of careful research and development.

The result was not one, but three prime examples of Alpine's meticulous problem-solving approach to engineering.

In designing the new models 7385, 7284 and 7283, Alpine began with the advanced technology found already in its proud line of fixed-mount systems. Then it analyzed the special demands placed on a unit subjected to the shocks of repeated removal, carry-around and installation.

GETTING A HANDLE ON SONIC SUPERIORITY.

You'll begin to notice the sophistication of the Alpine Removables even before you hear one. Lift the handle. You're holding much more than a convenient grip. It's part of a multifunctional system that makes these units especially suited to the rigors of transportability. Lifting the handle automatically disengages the unit from its mount and shuts off power. (While a 10-year Lithium battery maintains the memory of preset stations.) At the same time, another mechanism disengages the pinch rollers and capstan, preventing the roller distortion that can cause audible dropouts from poor tape-to-head contact. Finally, Alpine's new DustGuard™ tape door closure seals the unit to protect its mechanism

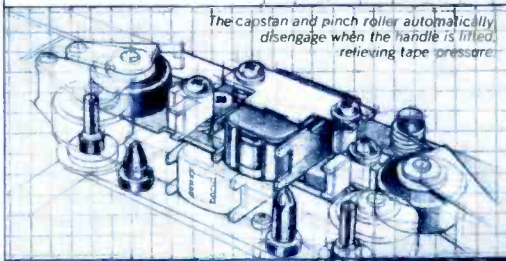
and any cassette inside.

Constant insertion and removal also require a precision guide mechanism and electronic interface to ensure a perfect mating between the audio unit and the car itself. It's the reason you'll find a special 18-pin modular connector on the back of each Alpine unit. A connector that's been tested to endure 25,000 re-

GZ's computer operates all functions in logical sequences. So it minimizes stress on the transport and protects your valuable tapes.

A HEAD FOR MUSIC.

Alpine's new quick-release units also benefit from advanced tape head



The capstan and pinch roller automatically disengage when the handle is lifted, relieving tape pressure.

movals and reinsertions, while allowing no degradation in musical signal.

A TAPE TRANSPORT TOUGH ENOUGH TO BE TRANSPORTABLE.

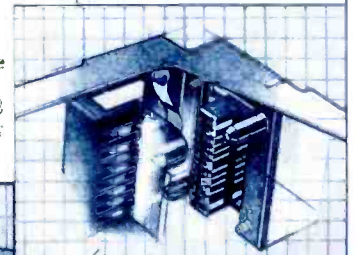
Nothing degrades the sound of a cassette player more than a transport mechanism that's out of alignment. And nothing can knock a transport out of alignment like the day-to-day shock of insertion and removal from a dashboard.

That's why you'll find Alpine's line of quick-release head units equipped with some of the most technologically advanced tape transports ever devised. The model 7385, for example, contains Alpine's full-logic GZ mechanism. A single custom LSI (Large Scale Integrated Circuit) controls all electronic functions. So you have instant command of true fast-forward and rewind, bidirectional tape scan, and radio monitor, among other capabilities. The

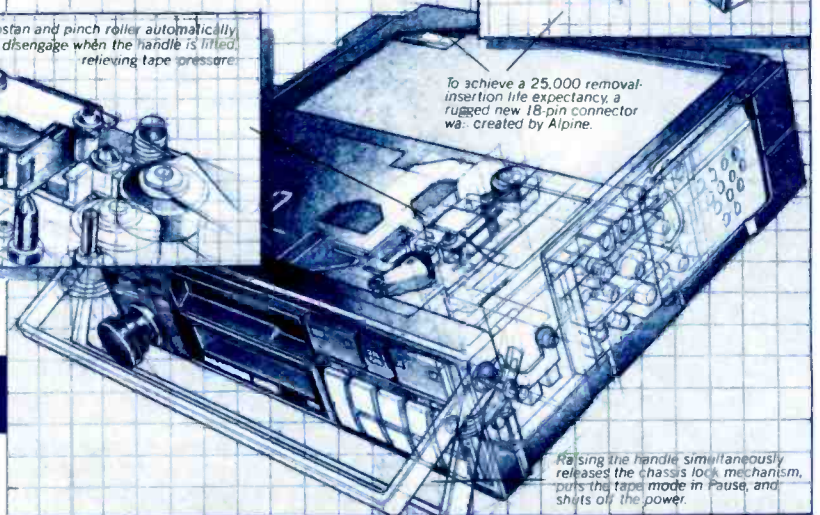
it lasts longer.

You'll also find Alpine's new systems equipped with special Dolby® B and Dolby® C noise reduction chips whose separate regulator circuits minimize the "pumping sound" caused by fluctuations in line voltage. And you'll find new Negative Feedback bass and treble controls. They give you a wider range of control to match the difficult acoustic environment of your car. A bass center detent of 30Hz instead of the usual 100Hz, for example—with ± 18 dB of boost/cut for bass and treble.

including microsemi-conductors that mount directly to the circuit board, further reduce the tuner's size while enhancing its performance. That's why you'll hear such audible advances as Automatic High Cut, Blend and Soft Mute circuits that help make even very weak signals listenable. Plus a Noise Elimination Circuit that detects and cancels the FM noise spikes caused by modern com-



To achieve a 25,000 removal-insertion life expectancy, a rugged new 18-pin connector was created by Alpine.



Raising the handle simultaneously releases the chassis lock mechanism, puts the tape mode in Pause, and shuts off the power.

INSIDE THE 7385 REMOVABLE FM-AM/CASSETTE PLAYER

design, including the sophisticated technology of HLTAC™. This revolution in materials and construction gives you the best possible audio quality. A precise tape head gap of just one micron, or one one-millionth of a meter, extends high frequency response from 20Hz to 22KHz as well as improving signal strength capability. By using twice as many metal laminations of half the usual thickness, the head maintains optimum magnetic characteristics under the toughest conditions. So it not only sounds better,

A POWERFUL TUNER AND THE BEST OF CONNECTIONS.

The Alpine Removables are capable of FM/AM performance that's every bit as impressive as their cassette capabilities. One reason is Alpine's T-10 II Tuner™. A single tiny chip integrates a number of high-performance FM circuits. Computer Aided Design optimizes the positioning of components and the routing of signals within the tuner module. Surface Mounted Devices,

puterized ignition systems. And because of its streamlined design, the T-10 II has minimized the fragile connections that can cause ordinary tuners to fail when subjected to the shocks of the road, or the stress of removable installations.

The Alpine Removables. Listen to the 7385, 7284 or 7283 at an Alpine specialist near you. You'll hear the most musically refined audio systems you can put in your dash. Time after time after time.



CRUTCHFIELD

Winter/Spring 1987



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You'll find the most helpful shopping information in the 108 page Crutchfield catalog.

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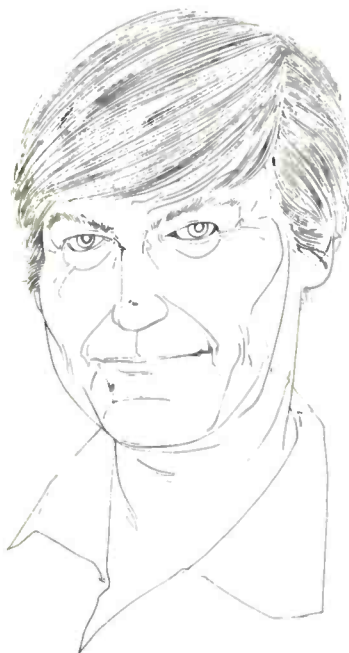
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CRUTCHFIELD

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AUDIO Q&A

by Ian G. Masters



Sssibilance

Q With certain CD's, and more often with announcers on FM, I am bothered by what I consider excessive and unnatural sibilance. I have tried to correct it with a parametric equalizer, but this degrades the clarity and brilliance of the music. What can I do?

JAMES R. WIRT
Cotati, CA

A Not a great deal, unfortunately. The problem is one of equalization, and it varies from disc to disc and station to station—or even announcer to announcer. It is impossible, therefore, to set your own equalizer so that it will be correct for every signal.

In the case of compact discs, a lot of source material was originally recorded for release on conventional vinyl records, and engineers often attempted to compensate for the shortcomings of that medium by the use of equalization at the recording or mixdown stage. Such correction is a very subjective matter, depending on the taste and judgment of the individual recording engineer, but it almost always shows up as enhanced high frequencies. Even original digital recordings sometimes suffer from the same treatment—old habits die hard, and some engineers equalize even when the medium doesn't require it.

In the case of FM announcers, the problem is again one of equalization, but usually this is not electronically generated. Rather, FM announcers tend to speak very close to their microphones,

and this can have the effect of emphasizing sibilants—and the lower register as well, which is one reason they do it.

Another reason for this close miking is simply that most radio studios are quite small. Not only would it be physically difficult to place the microphone much farther away, but it would result in an unpleasant "off-microphone" sound caused by room reflections, unless the station owners were willing to turn their studios into virtual anechoic chambers. The louder an announcer's voice is in relation to reflections and other ambient noises, the less these unwanted sounds will be picked up. The unnatural vocal quality that results as a byproduct of the practice is the price that the broadcaster has to pay.

Some electronic equalization could presumably be added to minimize the effect of close miking. But, in truth, many listeners—and virtually all announcers—like it, so it's not going to disappear in a hurry.

Active Subwoofers

Q I am considering adding an active subwoofer to my system so that my present speakers can handle the critical midrange more effectively. But if the electronic crossover routes all the low-frequency material to the subwoofer, won't the built-in passive-crossover networks in the satellites prevent their woofers from handling the midrange? If that is so, how can I obtain the improved midrange I want?

BRAD SHAW
Mancos, CO

A Typically, subwoofers work only below 100 or 150 Hz. In most full-range speakers, however, the woofer crosses over to the midrange driver or the tweeter at a much higher frequency. So even if the bottom couple of octaves are reassigned to the subwoofer, your conventional woofers will still have plenty to do.

The advantage of using a subwoofer is that it operates in the most power-hungry part of the audio spectrum. A large portion of the power an amplifier produces in driving a full-range speaker is occupied in producing the lowest notes. If this task is left to a separate amplifier, as in an active-subwoofer system, the main system will have a greater reserve of power for the middle and high frequencies. Lower distortion is the result (or higher overall levels, if that's what you want), although this is largely a matter of speaker efficiency and the size of your main power amplifier. If the system is not straining in its present configuration, then the benefit will be very small, at least as far as midrange performance is concerned.

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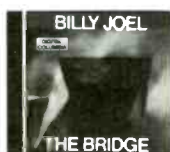
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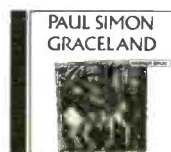
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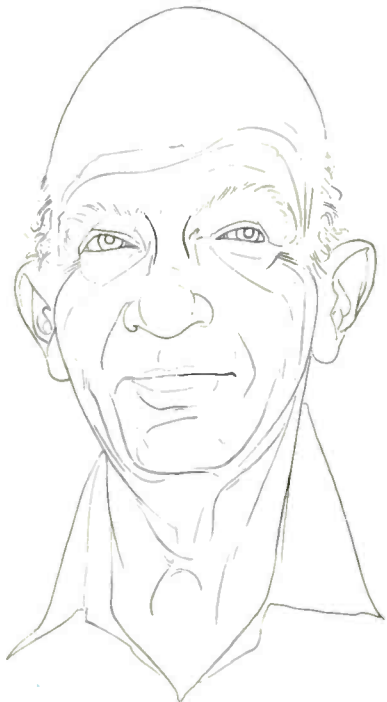
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by Julian Hirsch



Audio/Video Synergy

ALMOST weekly, we receive announcements of new audio/video (A/V) components, and we have already tested and reported on a number of them. Although our evaluation has been mostly limited to their audio qualities, we have also attended enough demonstrations of high-quality A/V systems to have formed some impressions of their full potential and limitations.

Not surprisingly, the most impressive A/V performance comes from the combination of a large-screen projection TV system and a hi-fi VCR or digital LaserVision player with a rather elaborate audio system. Such a choice of components is analogous to the use of a very high-quality (and usually expensive) amplifier or record player for demonstrating speaker performance or to the choice of a high-end speaker to reveal the qualities of an amplifier. In these situations it may not be too relevant to a listener if his own system falls well short of

the quality of the demonstration system.

When judging A/V systems, there are some criteria that will not apply to purely audio components. I must point out here that I speak as an audiophile of long standing whose interest in video is secondary. To me, the content of the program is far more important than the fine details of its picture or sound quality. Naturally, I do not like to have the picture obscured by ghosts or snow, nor the sound marred by poor audio response, and I can appreciate the combination of a truly fine picture with hi-fi sound, but these factors play a minor role in my enjoyment of TV.

For more than thirty years, I have been listening to TV through an external hi-fi amplifier and speakers, more as a reaction to the abysmal quality of the audio sections of most TV receivers than a desire to enhance my TV viewing pleasure with hi-fi sound. In the past, it has usually been necessary to modify the TV set to gain access to its audio channel at line level, an annoyance that has been eliminated from many recent sets, which are equipped with line-output jacks for just such a purpose in view of today's higher-quality, stereo broadcasts.

Some so-called "A/V" amplifiers and receivers provide little more than a video input for introducing the audio from a video source to the hi-fi system. More often, they also have several sets of audio and video inputs and outputs, along with switching facilities for recording, viewing, or dubbing video programs from VCR's or videodisc players (VDP's). Such a component may include rather complex audio and

video switching combinations for those people who wish to perform certain in-home editing tricks with multiple audio and video sources.

Signal switching is convenient, but it does nothing to alter the video program, and such products have only the usual tone controls and filters to modify the audio content. A new type of product, the surround-sound processor, has emerged in the last year or two. Designed to transfer as much as possible of the theater experience into the home entertainment environment, these A/V processors, which are sometimes described by their manufacturers as "expanders" or "enhancers," typically employ Dolby Surround Sound circuitry, and perhaps other optional signal modifiers, to achieve their goals.

During the past decade, over 700 films have been released with Dolby Stereo sound, and many of these have been transferred to videocassettes or videodiscs for home viewing. A few years ago Dolby Laboratories announced Dolby Surround, a home version of its theater stereo system. The theater system uses matrixing techniques to record four program channels in the two-track film format and to extract the original four tracks with an inverse matrix during playback. Unlike matrixed quadraphonic recordings, the Dolby Stereo system decodes into three front channels—left, center, and right—and an ambience channel that is heard through a number of loudspeakers mounted on the side and rear walls of the theater. A "steering" logic circuit, in combination with the center front channel, provides a sense of stereo to viewers on the sides of the theater.

In the home, most Dolby Surround decoders provide three channels—left, right, and surround. Sometimes a fourth, center channel is also included to anchor the center-stage sounds (such as dialogue) where the screen is located. A center channel is especially useful when widely spaced speakers are used with a large-screen projection system or even with a normal-sized TV. The surround channel is played back through rear or side speakers with a time delay to help distinguish it from the program channels,

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TECHNICAL TALK

which appear to come from the front of the room.

The high-frequency response of the surround channel is also rolled off above 7,000 Hz, principally to reduce the magnitude of program leakage from the main front channels into the surround channel. Most of the surround program material, which lacks positive directionality, does not require the full audio bandwidth, but it is retained in the front channels to provide the listening effect of a full-bandwidth system. Finally, a modified form of Dolby B noise reduction is used in the surround channel (which is Dolby B-encoded when the film's soundtrack is produced) to reduce crosstalk from the front channels even further.

Adding Dolby Surround to an existing stereo system requires, first, a Dolby Surround decoder, which will include an input balance control, a surround-matrix stage, a delay line with either a 20-millisecond (ms) fixed delay or a variable delay from 15 to 30 ms, a 7,000-Hz low-pass filter, and a modified Dolby B decoder. In addition, you will need an amplifier for the surround channel, either external or built into the decoder, and one or more surround-sound speakers. The effect will be enhanced if at least two surround speakers are used, one on each side of the room, although there is considerable flexibility in this matter. If several surround speakers are used, it may be more convenient to use a stereo power amplifier with both channels fed from the surround-channel output.

Some of the more sophisticated Dolby Surround models include amplifiers for all of the front and surround channels—usually four, with convenient four-way balance adjustments and the usual audio tone controls and filters. Rather than being an adjunct to a stereo music system, this sort of component can serve as the sole amplifying and switching center for a complete audio/video system, and it includes phono-input amplification and equalization. The electrical specifications are generally consistent with good hi-fi practice, although the most avid high-end audiophiles might not be impressed.

Since not every owner will wish to watch a steady diet of Dolby Surround video programs, such components usually have other means as well for deriving surround sound from stereo (or even mono) programs. The judicious use of matrix circuits to extract ambience from a stereo program, combined with a suitable amount of time delay, makes it possible to enhance the program's sound without unpleasant side effects. In the case of mono programs, the usual technique is to use comb filters to generate two dissimilar channels, which may also be processed with varying degrees of time delay before reaching the surround speakers.

All of which brings us to the question of what some sort of surround-sound processor can do for *you*, the viewer/listener. I have seen and heard enough of this kind of processing to appreciate that even a "normal-sized" TV image (19- to 26-inch diagonal) can benefit from the right sound treatment, if the program is scaled for it. Obviously, it would be a waste for a talk show or news broadcast, but applied to a movie with a broad scale of action and a soundtrack to match, surround sound can be a tremendous improvement. At its best, with a good projection TV system, such an audio/video system can equal almost any theater presentation in its impact.

At this writing, Superbowl XXI has just become history, in more ways than one. It was telecast over much of the nation with stereo sound *and* Dolby Surround. It doesn't take much imagination to appreciate the enhanced impact it had for viewers equipped to decode the audio, especially if they saw the New York Giants win the game on a large-screen set.

I have long felt that while video and audio programs are perceived very differently by the viewer/listener, and in many respects pose an "apples and oranges" comparison problem, when mixed in the right proportions they can provide very tasty entertainment. The means are now at hand to bring audio and video together comfortably in your home, and with a minimum of expense and complication.

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TEST REPORTS



JOOK LEUNG

AKAI VS-565U VHS HI-FI VCR

Julian Hirsch, Hirsch-Houck Laboratories

THE Akai VS-565U VHS Hi-Fi videocassette recorder features MTS (multichannel television sound) decoding for stereo or SAP (separate audio program) broadcasts and a built-in amplifier, which is rated to deliver 10 watts per channel into 8-ohm loads from 90 to 20,000 Hz with no more than 0.9 percent total harmonic distortion. With the addition of a monitor or TV set and a pair of speakers, you can have a complete video system with stereo sound capability.

The rotary head drum of the VS-565U has six heads: the normal pair of video recording/playback heads, a second pair for improved video quality at slow tape speeds or for special effects such as slow motion or freeze-frame, and a third pair for the hi-fi sound channels. The recorder also contains VHS HQ cir-

cuitry to enhance picture quality.

In the VHS Hi-Fi system, the hi-fi audio channels are recorded just ahead of the video information on two separate frequency-modulated subcarriers. Video information is recorded closer to the surface of the tape than the audio program, which it partially erases but leaves mostly intact. The audio and video heads are mounted on the rotating drum at different azimuth angles, effectively isolating the audio and video signals during playback.

The low noise level of the frequency-modulation system used for the hi-fi audio recording and playback is further reduced by a proprietary companding system. The frequency response, flutter, and distortion characteristics of VHS Hi-Fi recordings are far superior to those of conventional analog tape recordings and are comparable to those of

digital recordings. For compatibility with ordinary (non-hi-fi) VCR's, a standard longitudinal mono soundtrack is simultaneously recorded on the tape by a nonrotating audio head.

The Akai VS-565U can be tuned to any of 107 channels, including all the VHF and UHF broadcast chan-

The audio performance of the Akai VS-565U came remarkably close to matching the qualities of digital media—wide, flat response, low noise, and negligible flutter.

nels plus a number of cable channels. As delivered, it is set to receive Channels 2 to 13, and up to twenty additional channels can be entered into the tuner's memory for instant access. The VS-565U can be programmed to record up to six different broadcasts over a two-week pe-

TEST REPORTS

riod. Like most of the VCR's other setup adjustments, programming can be done very conveniently using a display on the TV screen, but since the same information is presented simultaneously on the front display panel of the VCR, there is no need to turn on the TV set in order to enter your programming instructions.

Most of the controls of the VS-565U—including the tape-transport controls, channel selection, and audio volume—are large, soft-touch buttons. Smaller buttons set the

time and date on its internal clock/calendar and operate its pause and recording functions. Small slide switches along the bottom of the front panel select the input source, audio output mode (stereo or mono), tape speed, and either the normal (longitudinal) audio soundtrack or automatic switching to the hi-fi soundtracks when they are present on a tape.

Rotary controls adjust tracking (a speed vernier for playing tapes made on other machines) and picture sharpness. There is a miniature

(1/8-inch) stereo phone jack on the panel. Two horizontal sliders adjust the hi-fi recording level; the normal recording level is set automatically.

The tape-loading slot is covered by a hinged transparent-plastic window, so that a loaded cassette can be seen (the interior of the compartment is illuminated when the VCR is in operation). The display window, at the upper right corner of the panel, contains bright, multicolored indications of virtually every aspect of the recorder's operation. These include audio level (two horizontal rows of small fluorescent squares, with a peak-hold feature), tape speed, hi-fi or normal audio, the presence of stereo or SAP subcarriers, the channel number, calendar and clock information, and unattended-recording information. In addition, a number of symbols show the status of the tape transport (play, record, fast forward, reverse, pause, slow or freeze-frame, etc.).

The rear panel contains the usual input connectors for VHF and UHF antennas, an RF output to the TV set (switchable between Channels 3 and 4), and video and audio inputs and outputs for connection to a video monitor and external amplifier. In addition, there are spring-loaded speaker outputs for the built-in power amplifier.

The VS-565U is supplied with a wireless remote control that operates most of its normal functions, including channel selection, timer programming, transport operation, volume, and power switching. The recorder, which is finished in black, measures 17¼ inches wide, 15 inches deep, and 4¼ inches high, and it weighs just under 20 pounds. Price: \$880. Akai, Dept. SR, 225 Old New Brunswick Rd., Piscataway, NJ 08854.

Lab Tests

We did not formally test any of the video features or performance of the Akai VS-565U, although a runthrough of its video capabilities revealed excellent picture quality and very useful and functional special effects. Following the illustrated programming and operating instructions in the manual made the setup of the machine a simple and straightforward process.

FEATURES

- Receives, decodes, and records MTS stereo and SAP transmissions
- Records audio from any external high-level source, including FM tuner for simulcasts
- SP and SLP record speeds; SP, LP, SLP playback speeds
- Can tune 107 channels; can be preset for up to 32 channels
- Receives cable channels
- Programmable for unattended recording of up to six events over fourteen days
- Built-in 10-watt-per-channel amplifier
- Audio output switchable for stereo, left channel, right channel, mono, or SAP
- Front-panel headphone jack
- High-speed "Return to Zero" rewind
- Multiple slow-speed playback
- Single-frame picture advance
- Picture sharpness control
- Twin-slider record-level controls (hi-fi mode) with limiter
- Fluorescent peak-reading/peak-hold audio level indicators for each channel, marked from -50 to +10 dB (red above 0 dB)
- One-touch recording
- Preset "sleep turnoff" in either record or playback mode
- Wireless infrared remote control

LABORATORY MEASUREMENTS

Recording Section

Record-playback frequency response (referred to 1,000-Hz level): hi-fi mode, 20 to 20,000 Hz ± 1 dB; normal mode, 39 to 11,500 Hz $+0.8$, -6 dB at SP speed, 30 to 3,500 Hz $+3$, -6 dB at SLP speed

Harmonic distortion (THD + noise) at 1,000 Hz: hi-fi mode, 0.26% at 0 dB, 0.18% at +10 dB; normal mode, 3.2% at +6 dB in SP speed, 2.9% at 0 dB in SLP speed

Signal-to-noise ratio: hi-fi mode (A-weighted, referred to +19-dB signal level), 96.5 dB; normal mode (A-weighted, referred to 3% distortion signal level), 53.3 dB at SP speed, 45.2 dB at SLP speed

Record-playback flutter (DIN-weighted peak): hi-fi mode, $\pm 0.01\%$; normal mode, $\pm 0.17\%$ at SP speed, $\pm 0.25\%$ at SLP speed

Input sensitivity for 0-dB recorded level: 50 mV with maximum record-level setting, 315 mV with controls at center detents

Input overload level: 2.65 volts

Playback level at 1,000 Hz from 0-dB signal: 0.37 volt

Volume-control steps: 2 dB

Power-Amplifier Section

Clipping power output at 1,000 Hz: 11.8 watts into 8 ohms, 14.8 watts into 4 ohms

Input sensitivity for 1-watt output: 62 mV

Noise (referred to 1-watt output, A-weighted): -82 dB

Harmonic distortion (THD + noise) at 1,000 Hz: 0.033% at 1 watt output, 0.44% at 10 watts output

MTS (stereo sound) Decoder

Frequency response: 20 to 16,000 Hz $+1.3$, -2.5 dB

Distortion (at 300 Hz, 9-kHz deviation): 0.32%

Sounds For The Power Hungry.

Admit it. You're into power. I don't blame you. I'm as power crazed as you. After all, I'm Pioneer's powerful new 50-watt ETR FM/AM cassette car stereo. And I'll give you four times the power of standard systems. New Supertuner III™. Of course! Dolby® B & C? Yes! Separate bass and treble controls? Absolutely! Come. Play with power.



KEH-9292

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CIRCLE NO. 65 ON READER SERVICE CARD

PIONEER
CATCH THE SPIRIT OF A TRUE PIONEER.



A speaker designed to one standard: Live music.

If you have ever heard music live, you can appreciate what's behind the Bose® 901® Series V Direct/Reflecting® speaker system.

Live music is the complex interaction of direct and reflected sound. Most speakers, however, are not designed with this in mind—which is why they sound more like speakers and less like music.

This was the conclusion reached years ago by a Massachusetts Institute of Technology research team led by Dr. Amar G. Bose. Through extensive research, his team discovered the secret of live music: that it is the precise balance of direct and reflected sound heard during live performances that makes live music sound *live*. Finally, they designed a product that could put this discovery to work in the living room: the Bose 901 Direct/Reflecting® system.

The Bose 901 Series V speaker: a system of audio innovations.

The introduction of the revolutionary Bose 901 system in 1968 redefined the phrase "high fidelity." For the first time, a speaker was capable of reproducing music with much of the impact, clarity and spaciousness of a live performance. The 901 system's concert hall sound and compact size made it an instant success with both audio critics and audio enthusiasts. Today's 901 Series V system incorporates some 350 improve-

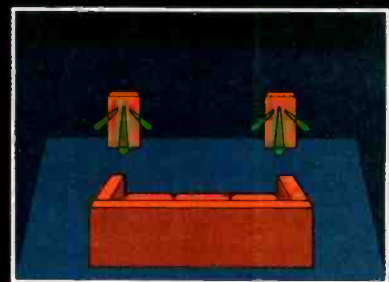
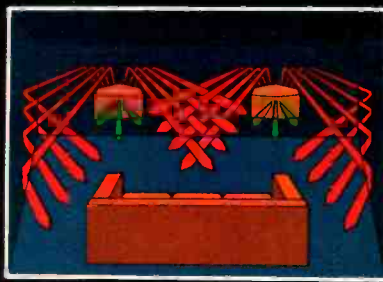
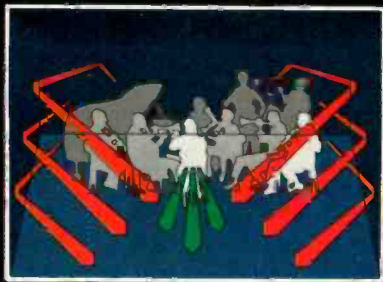


The Bose 901 system's Direct/Reflecting® speaker design turns your listening room into part of your stereo system. You'll hear *full stereo throughout the listening environment*—no matter where you sit or stand.



The 901 system's nine full-range HVC drivers are precisely arranged to re-create live music's natural balance of direct and reflected sound. Each driver is matched and tested by the Bose Syncom® II computer.

The Bose-built HVC driver is made out of some of the strongest advanced composite materials available. The heart of the driver is the Helical Voice Coil, which handles *instantaneous peaks of up to 4,000 watts!* Multiple HVC drivers give the 901 system *unlimited power handling* in home applications.



In the concert hall (above left), listeners hear a complex mixture of direct and reflected sounds, arriving from different directions and at different times. Bose Direct/Reflecting® speakers (center) are designed to reproduce music in much the same manner, allowing listeners to hear greater realism and impact. Conventional speakers (above right), on the other hand, reproduce primarily direct sound, causing listeners to miss many of the critical acoustic cues that make live music sound live.

ments over the original. The speaker's innovative audio technology turns your listening room into an essential part of your stereo system. The 901 system works by reflecting most of its sound, instead of aiming all the sound toward you like a conventional speaker. So, anything you listen to over a 901 system picks up a strong sense of concert hall realism, because the system is capable of reproducing the concert hall's natural balance of direct and reflected sound.

The right speaker for the best in audio: digital.

The 901 system's ultra-high efficiency and *unlimited power handling* in home applications make it an ideal speaker to use with almost any stereo system. It will help you get the most out of the best sources of sound available as well. For example, you'll hear digital compact discs sound as close to live as possible, because the Bose 901 system has been specifically engineered to take full advantage of their superior sound. Digital Dynamic Range® circuitry and Direct/Reflecting® speaker design allow the 901 system to accurately reproduce live music's impact, clarity and spaciousness.

The right speaker for your entire system.

Whether you're listening to digital audio or hi-fi video, the Bose 901 Series V system will let you get the most out of your entire equipment and software investment—because it will let you hear all of the realism that a truly good audio/video system is capable of producing. Audition the Bose 901 Direct/Reflecting® speaker system at your authorized Bose dealer, and judge for yourself. Then take the next step—and invite a legend home.

There is an entire line of Bose speakers that incorporates much of the advanced technology developed for the 901 system. For more information and an all-product brochure, write Bose Corporation, Dept. SR, 10 Speen Street, Framingham, MA 01701.

When you write for information, be sure to request a copy of Dr. Amar Bose's *Sound Recording and Reproduction*. This paper describes the research effort behind the original Bose 901 system.

The Acoustic Matrix™ enclosure helps the 901 system control sound by precisely controlling air. Made up of 14 separate acoustic regions, it isolates the drivers and regulates internal air flow, resulting in increased bass and lower distortion.

The Bose 9C1 active equalizer uses low-distortion electronics to control the system's total frequency response, allowing a compact system to produce full-frequency sound. Digital Dynamic Range® circuitry makes the entire system ideal for use with the best sources available.

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BOSE
Better sound through research.

TEST REPORTS

We measured audio recording and playback performance in the hi-fi mode and at both speeds in the longitudinal mode (the speed has no effect on the quality of a hi-fi recording). The hi-fi frequency response was very good and virtually identical at recording levels of 0 and -20 dB (referred to the fluorescent level-indicator markings), ± 1 dB from 20 to 20,000 Hz.

The playback distortion was 0.26 percent at 0 dB. Although it rose at lower recording levels, that merely reflected the increased contribution of the noise level to the THD + noise measurement. The recording circuits overloaded abruptly at +19 dB, well off-scale on the indicators, which have a range of -40 to +10 dB. The A-weighted noise, referred to +19 dB, was -96.5 dB. A characteristic of VHS Hi-Fi VCR's is low flutter, which in this case measured only ± 0.01 percent (DIN-weighted peak).

At the faster standard-play (SP) speed, the longitudinal track's frequency response at both 0 and -20 dB was +0.8, -6 dB from 39 to 11,500 Hz. At the slower (SLP) speed, the playback output was at a maximum at 200 Hz, falling off at both lower and higher frequencies. The distortion was 2 to 3 percent at recording levels of 0 to +6 dB. The

A-weighted noise was -53.3 dB at the SP speed and -45.2 dB at the SLP speed, referred to the 3 percent distortion signal level. The respective flutter measurements were ± 0.17 and ± 0.25 percent (both DIN-weighted peak readings).

We also measured the frequency response and distortion of the MTS (stereo) circuits of the VS-565U. The frequency response varied over a range of +1.3, -2.5 dB from 20 to 16,000 Hz (referred to the 1,000-Hz level), and the 300-Hz distortion was 0.32 percent.

The audio power amplifier's performance was measured from its line inputs to its speaker outputs. Into 8-ohm loads, the 1,000-Hz output clipped at 11.8 watts, and with 4-ohm loads it clipped at 14.8 watts. The digitally controlled volume varied in 2-dB steps, and the input stage overloaded at 2.65 volts (which is more than sufficient to handle the maximum signal from a CD player, for example). The 1,000-Hz distortion (8 ohms) was 0.033 percent at 1 watt and 0.44 percent at 10 watts output.

Comments

The audio performance of the Akai VS-565U was at least as good as we have seen from any VHS Hi-Fi VCR, which is to say very good

indeed. As our measurements show, it came remarkably close to matching the qualities—wide, flat response, low noise, negligible flutter—of digital media, and it easily exceeded the performance of analog cassette decks. Of course, a video-cassette cannot be edited by physical cutting and splicing, and editing by dubbing is not only cumbersome but nearly impossible to do with any degree of precision.

Still, for recording long programs without interruption at a nearly negligible tape cost, a hi-fi VCR is difficult to match. And, as we said earlier, the video performance of the VS-565U was subjectively excellent. Copying a videodisc test record at both SP and SLP speeds, we were impressed by the minimal degradation in picture quality, even at the lower speed.

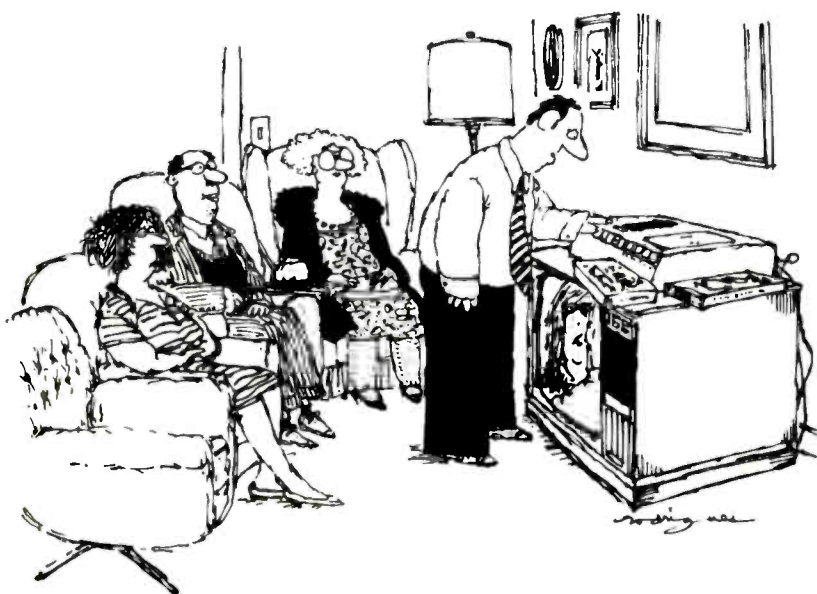
The VS-565U is also easy to operate and program (although it is necessary to study the manual first). We appreciated the duplication of status displays on the VCR panel and the TV screen, since we usually program a VCR for future unattended recording without turning on the TV. The remote control worked flawlessly, and the internal mechanical noise of the VS-565U while its transport modes were being changed was very low.

It was clear from our measurements that the MTS reception was definitely of "hi-fi" caliber, even though the available broadcast material did not afford any very impressive demonstrations in this respect. This situation should improve with time.

The built-in amplifiers were perfectly adequate for their purpose. With speakers of moderately high efficiency, both the volume and sound quality were first-rate—and considerably superior to most of the sound we have heard coming directly from TV speakers. The sound quality of tapes dubbed from CD's was excellent, certainly close to that of the originals.

Overall, the Akai VS-565U impressed us as an unusually full-featured and thoughtfully designed VCR. Its performance was fully commensurate with its position as one of Akai's top models.

Circle 140 on reader service card



"Well, goodnight Leo, goodnight Florence. According to the tape counter, this is where you came in."

16 mg. "tar", 1.0 mg. nicotine av. per cigarette by FTC method.

SURGEON GENERAL'S WARNING: Cigarette
Smoke Contains Carbon Monoxide.

CAMEL FILTERS

Share a new adventure.



Bass vs. Space

It's an old dilemma: To tolerate those large, room-dominating loudspeakers for the sake of true bass? Or sacrifice bass for the sake of more living space?

The classic solution to this problem—a solution that allows even efficiency-dwellers ample bass *and* space—is the satellite/subwoofer speaker system. Simply put, the mid-range and high frequencies are delegated to a pair of small satellite loudspeakers, placed for optimum stereo imaging. The bass is handled by a single large subwoofer unit, which can be hidden virtually anywhere in a room. (How? Frequencies under 100 hz are nondirectional;

the ears can't tell where they're coming from. So one subwoofer suffices.)

The most common kind of satellite/subwoofer system is "passive" (externally powered), such as the Canton Plus C.

Active Advantages

The Canton Plus Beta subwoofer looks much like the Plus C, but does the job quite differently. That's because it's "active" (internally powered).

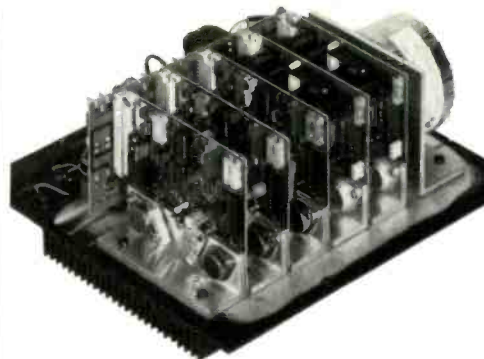


Canton's Plus Beta active subwoofer.

Don't have a preamp? No problem, your receiver can drive the Plus Beta too. The amplified power from your receiver is dropped down to preamp line level and the Plus Beta amplifies this signal through its own three amplifiers.

Canton has a variety of satellites to choose from: minis, indoor/outdoor, ultra-thin speakers or bookshelf units.

Featured at right are the Plus S mini speakers. Like most Canton products, they are available in black, white or walnut.



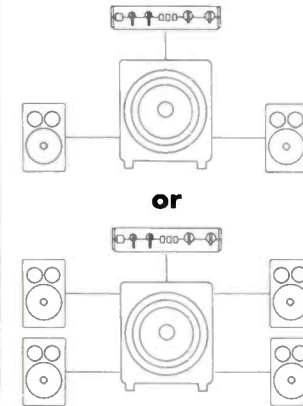
The Plus Beta contains three discrete power amps with digitally controlled active filters. They are frequency-driven and provide dynamic soft clipping for overload protection. The bass amplifier is rated at 100 watts RMS power; the satellite amps at 80 watts RMS per channel. THD is less than 0.01%.

Three advanced power amplifiers are built in, one custom-designed for the subwoofer and one each for the satellites. The active crossover network has three selectable crossover frequencies, allowing unparalleled flexibility in matching the Plus Beta with satellites. There is also an input sensitivity control and a bass level control.

Consequently, the Plus Beta can be used with a wide



The Plus Beta's control panel allows adjustment of: crossover point, for perfect matching with any satellite loudspeakers; input sensitivity, to optimize preamp compatibility; and bass level control to adapt for room characteristics.



The Plus Beta can accommodate an extra pair of satellites, either

in the same room or as extension speakers in another room.

variety of satellites. For example, Canton's affordable and very compact Plus S or the high-performance Karat 100. If desired, the Plus Beta can accommodate two pairs of satellites. By way of driving the Plus Beta, virtually any preamp or receiver will do, whether a high-end unit such as the Canton EC-P1 or a more modest design.

Where space is at a premium, but the awesome dynamic range of digital program sources can't be missed, there's no better option than an active subwoofer such as the Canton Plus Beta.



A Plus Beta subwoofer/satellite system can be driven by any preamp, such as Canton's EC-P1.

Find out more about the entire Canton product line by visiting an Authorized Canton Dealer and picking up Canton's 1986/1987 40-page loudspeaker Journal.

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CIRCLE NO. 33 ON READER SERVICE CARD



HUNG/NORTON

PIONEER C-90 PREAMPLIFIER

Julian Hirsch, Hirsch-Houck Laboratories

THE C-90 remote-controlled preamplifier is one of Pioneer's Elite series of hi-fi components, which also includes a tuner, amplifiers, cassette decks, and speakers. As their name implies, the Elite components are relatively free of the compromises and economic constraints typical of most consumer audio products.

For example, the chassis and all the screws used in the C-90 are copper-plated. In addition to its electrical benefits, such as reduced stray-signal coupling and noise, the copper plating is said to help damp unwanted mechanical vibrations. Similarly, the large volume-control knob is made of solid aluminum to reduce vibrations of the control shaft caused by sound waves in the listening room, and the entire amplifier is supported on polycarbonate isolating feet. All signal switching is done by relays controlled by DC switches on the front panel.

The C-90 is not only an audio

control center, it is designed to control and modify video signals as well. It can select incoming signals from five video sources and channel the video and audio outputs for recording on up to three VCR's. It has adjustable video-enhancing circuits to sharpen image contours, improve detail, and reduce visible video noise. The video and audio control functions of the preamplifier are essentially separate, so that the video recording or playback can be from a different source than the accompanying audio program.

The wireless remote control of the C-90 is actually a *system* control that can control most of the functions of a compatible Pioneer AM/FM tuner, TV set, turntable, CD player, VCR, or cassette deck. The remote adjusts volume through a small motor attached to the preamplifier's volume-control potentiometer, thus avoiding the distortion and limited dynamic range typical of the voltage-controlled amplifiers

that are often used for that purpose.

Most unusual for a preamplifier, the C-90 has three separate power supplies (including their power transformers). Two are for the left and right channels, and the third operates the video circuits, relays, and display panel. This feature serves to reduce intermodulation between the left and right channels as well as to prevent any video signals from interfering with the audio program.

Normally, the large volume knob is the only rotary control visible on the front panel of the C-90. Push-buttons select the audio signal source (CD, phono, or tuner) or the monitor playback from either of two tape decks. Another row of buttons is used to select the video input from a videodisc player, three VCR's (one of them connected through front-panel jacks), and a TV tuner. Small red lights on the video buttons show which is supplying an audio signal, and green lights indicate the video source when the two sources are different. A small brass button sequentially selects the various video sources. A similar button is the audio muting

TEST REPORTS

control, which reduces the level by 20 dB.

A silver-colored strip across the black panel of the C-90, below the input-selector buttons, contains colored lights that show the full status of the unit's audio and video controls at all times. The lights are very small (perhaps $\frac{1}{16}$ inch in diameter) and are visible only at close range.

The lower part of the panel swings down to reveal a number of less-often-used controls, including the bass and treble tone controls, the balance control, and the three video enhancement controls, all operated by small knobs. Pushbutton switches bypass the tone controls and activate the subsonic and high-cut filters. A tape-copy switch allows copying in either direction between two audio decks, and another switch selects either mono or stereo operation.

Also behind the swing-down panel is a switch to select the operating conditions for the type of phono cartridge used: moving-magnet (MM) or moving-coil (MC) with ter-

mination resistances of either 3 or 40 ohms. A hybrid step-up transformer is used for MC cartridge playback, and its lower resistance and capacitance compared with conventional step-up transformers are said to provide improved frequency response.

The Pioneer C-90 is a fairly large preamplifier, measuring 18 inches wide, 16 inches deep, and 5 inches high. It is equipped with wood side panels in a glossy, dark finish. The phono and CD input jacks and the audio output jacks are gold plated. In addition to the various audio and video input, output, monitor, and control jacks, the rear apron contains three AC outlets, two of them switched. Price: \$800. Pioneer Electronics, Dept. SR, 5000 Airport Plaza Dr., Long Beach, CA 90815.

Lab Tests

The clipping level of the C-90's audio outputs (terminated in the EIA standard load of 10,000 ohms in parallel with 1,000 picofarads capacitance) was 11 volts, comfortably exceeding the rated 8 volts.

Since the rated output was at least four times as high as any power amplifier will require in order to develop *its* rated output, the conservative design of the C-90 preamplifier was apparent from the beginning of our measurements.

The distortion specification of the C-90 is 0.002 percent, and at most usable output levels and frequencies, that was about what we measured. At 1,000 Hz, the distortion was 0.003 percent or less for outputs from 0.3 to 4.5 volts, rising to a mere 0.0063 percent at 10 volts. At 2 volts output (a more reasonable maximum value for any preamplifier), the distortion was 0.001 percent at 20 Hz, rising smoothly to 0.0016 percent at 1,000 Hz and 0.003 percent at 20,000 Hz.

The RIAA phono equalization was one of the most accurate we have ever measured (comparable to the tolerances of the pre-equalization network we use for this measurement). It was flat within ± 0.1 , -0.2 dB from 20 to 20,000 Hz. The frequency response of the preamplifier was comparably flat, and the response with its high filter engaged was 3 dB down at 11,500 Hz. The subsonic filter dropped the response by only 0.5 dB at 20 Hz (it is rated to have a 6-dB-per-octave slope below 7 Hz).

The bass tone control had an unusual boost response, peaking at about 100 Hz with a 9-dB rise and falling off to the midrange level at 27 Hz (the full boost actually *reduced* the output below 27 Hz). In its full-cut mode, the control reduced the output to -12 dB at 50 Hz. The high-frequency tone-control curves were hinged at about 3,500 Hz. We did not test the video characteristics of the C-90.

Comments

Like some other audio components we have seen recently, the Pioneer C-90 is offered as a "digital-compatible" product. In this case, unlike most, that is a perfectly accurate description of the component's performance.

For one thing, the C-90's frequency response (including the RIAA equalization accuracy) is as flat as that of the finest CD players, and better than most. For another, its

FEATURES

- Input selection and switching of up to five audio sources (CD, phono, tuner, two tape decks) and up to five video sources (three VCR's, videodisc player, TV set)
- Connections for dubbing audio and video independently in either direction between any two VCR's or audio tape decks
- Video-enhancing circuits to adjust sharpness, detail, and video noise reduction in recording or playback
- Front-panel audio/video inputs and outputs for one VCR
- Audio muting (20 dB)
- Bass and treble tone controls, tone-defeat button
- Phono preamplifier switchable for moving-magnet (MM) cartridge or moving-coil (MC) cartridge with either 3- or 40-ohm input
- Colored LED status indicators for all controls
- Three AC convenience outlets (two switched)
- Wireless remote control for all preamplifier functions (with motor-driven volume control), can also control entire system of compatible Pioneer A/V components

LABORATORY MEASUREMENTS

Frequency response (through CD input, EIA standard load): 20 to 20,000 Hz ± 0.2 dB

Voltage output at clipping: 11 volts

Harmonic distortion (THD + noise at 1,000 Hz): 0.0076% at 0.1 volt, 0.0017% at 1 volt, 0.002% at 2 volts, 0.0063% at 10 volts

Sensitivity (for a 0.5-volt output): CD input, 83 mV; MM phono, 1.35 mV; MC phono (40 ohms), 0.13 mV

A-weighted noise (referred to a 0.5-volt output): CD, -101 dB; MM phono, -86 dB; MC phono, -80 dB

Phono-input overload level (MM): 170 to 185 mV, depending on frequency

Phono-input impedance: 50,000 ohms and 260 picofarads

RIAA phono-equalization error: ± 0.1 , -0.2 dB from 20 to 20,000 Hz

An open-and-shut case for great music.

Don't let its unassuming dimensions fool you. True, the new Sony Discman® D-10 is the smallest and lightest CD player you can find. But surprisingly, it comes packed

The right choice at home.



with features you'd expect to find only in full-sized models. In fact, with 21-track selection programmability, 4 repeat modes and optional remote control, the D-10 performs splendidly as the centerpiece of your home stereo system.

But when you're as portable as a Discman, it's tough to stay put for long. Which is why it comes with a

rechargeable battery for up to 4½ hours of digital music on the go. There are even optional accessories that can make Discman an integral part of your car stereo system.

Whether you choose the D-10 or any new Sony Discman, one thing is certain. You get the most advanced CD player technology available today. For at Sony, we not only created the world of Compact Disc, we keep making it bigger and better. Even when we make it smaller.

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BOARD!**

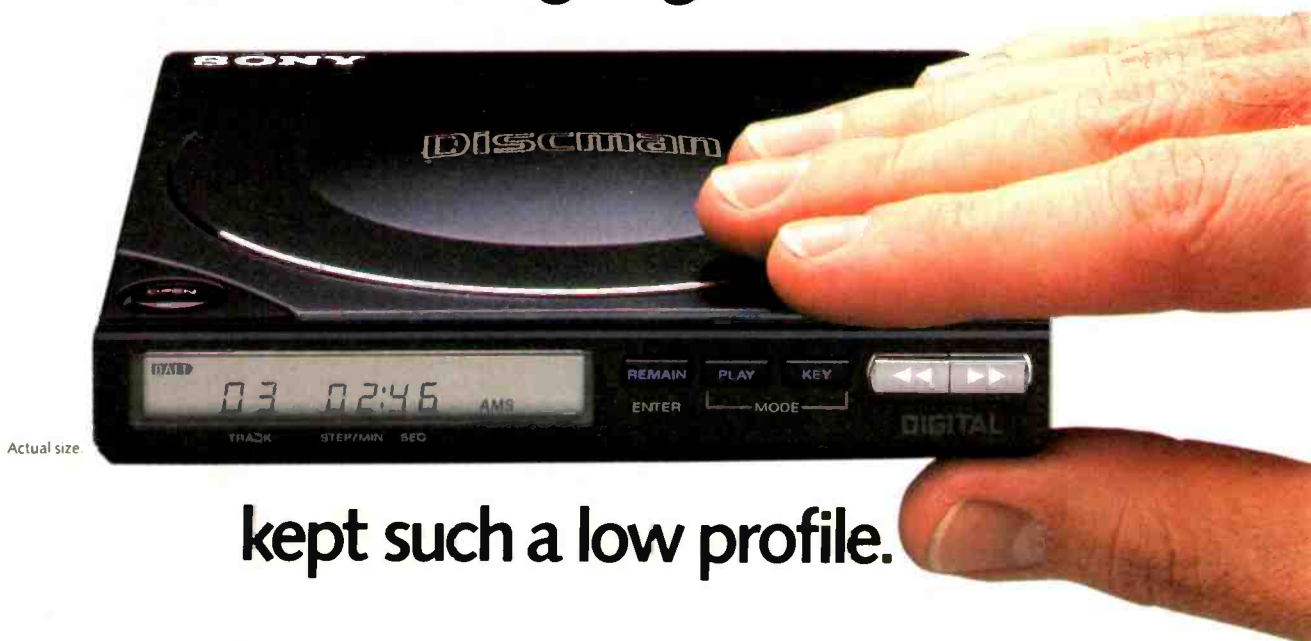
Right at home
in your car.

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THE LEADER IN DIGITAL AUDIO™

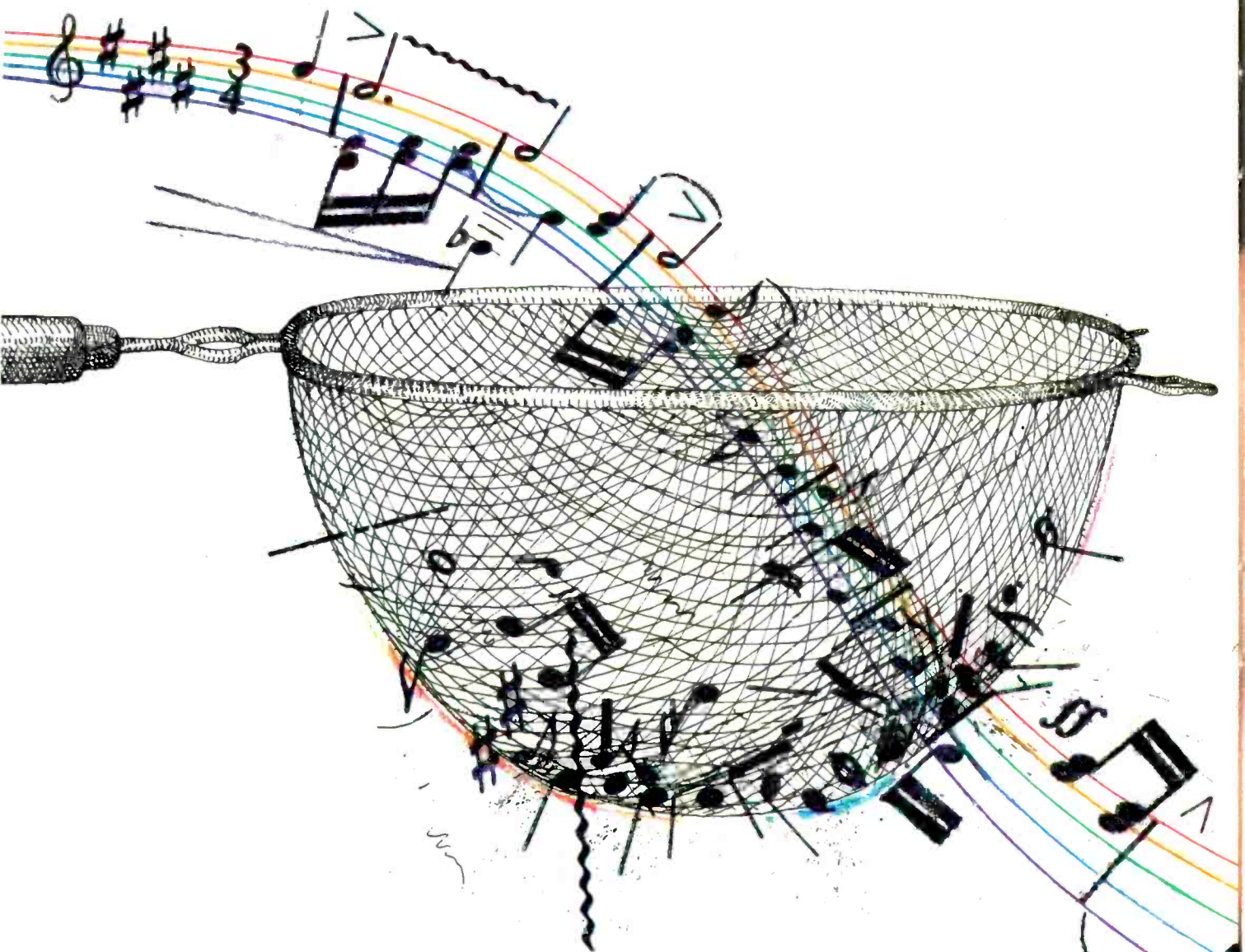


Never has a compact disc player with
so much going for it



Actual size

kept such a low profile.

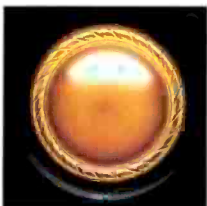


EVEN THE FINEST LOUDSPEAKERS
SIFT OUT SOME OF
THE MID-RANGE DETAIL.WHY?

Many of today's more expensive loudspeakers have impressive specifications that may look great on paper, but do not necessarily sound great in your home. For instance, they boast frequency ranges that extend well beyond the limits of human hearing. But while these loudspeakers may be sensitive to the musical extremes of the spectrum they are often insensitive to the subtle details in between. Details that create the finer musical nuances within the mid-range.

At Altec Lansing® on the other hand, we've designed our new line of loudspeakers to recreate every subtlety of recorded music. To give not only the highs and lows but everything in between.

The secret of Altec Lansing's extraordinary timbre, texture and detail? A polyimide mid-range that produces an expansive stereo image to give you pure uncolored sound. In fact, Altec Lansing loudspeakers are so uncompromising, so revealing, they prompted J. Gordon Holt of *Stereophile* magazine to write, "I have been hearing more going on in (the mid-range of) old, familiar recordings than I have ever heard before...instrumental sections are suddenly resolved into many individual instruments rather than a mass of instruments," and they compelled him to add that Altec Lansing's speakers have "high end sweetness and openness... with astounding inner detail."



Polyimide/Titanium
Mid-range

What's more, our woofers provide unparalleled low frequency definition that beautifully complements the flawless performance of our mid and high frequency drivers. How? With woven carbon fiber cones that are rigid yet lighter than paper or

polypropylene to virtually eliminate breakup, flexing and distortion.



Carbon Fibers in Woofer Cone

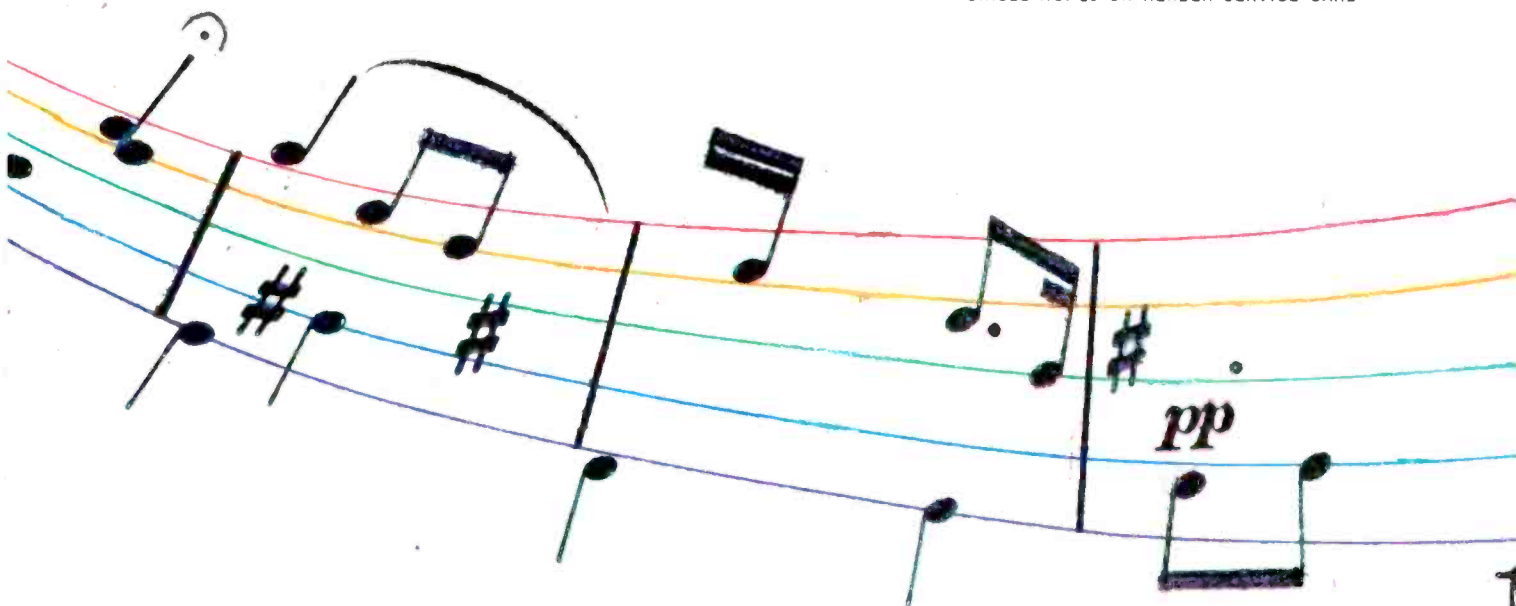
The unique features like these, that make our home loudspeakers so impressive, also extend into our automotive loudspeakers. In addition, our automotive loudspeakers have features like Thermoisolate™ construction and high temperature resistant materials to assure lasting performance even in the extremes of a demanding auto environment. As a result, you'll capture the same details in your car as you do at home.

Listen to Altec Lansing loudspeakers for yourself and hear how much detail you've been missing. Call 1-800-ALTEC88 for information and the Altec dealer nearest you (in Pennsylvania 717-296-HIFI). In Canada call 416-496-0587 or write 265 Hood Road, Markham, Ontario L3R 4N3, Canada.



ALTEC LANSING. LOUDSPEAKERS FOR THE WELL-TRAINED EAR.

CIRCLE NO. 20 ON READER SERVICE CARD



A New Standard: THE NAD 7220PE.

Our goal was to design a receiver in the NAD tradition, with true state-of-the-art performance . . . but for under \$300! The NAD 7220PE represents the culmination of our most intensive engineering effort ever.



We started with NAD's most advanced amplifier technology—the "Power Envelope." This circuitry provides extra reserves of tone-burst power for music—nearly triple the rated continuous power! Then we added an outstanding FM section with three stages of I.F. filtering for freedom from noise and interference, and a dual-gate MOSFET front-end for superb sensitivity. But we didn't stop there. The finishing touch is our unmatched discrete phono pre-amp with a dynamic range over 100dB, more than enough for the demands of today's (and tomorrow's) digital recordings. The 7220PE sets new standards by which other receivers, costing much more, will now be measured.

We invite you to audition this truly remarkable product.

NAD

For more information on the NAD 7220PE and a list of dealers, send us the coupon below.

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NAD (USA), INC., 675 Canton Street, Norwood, MA. 02062

signal-to-noise ratio is considerably *better* (especially when referred to 2 volts output) than that of any CD player, to say nothing of the CD's themselves. By our standards, that makes the Pioneer C-90 the *true peer* of any digital sound source—the only preamplifier we have tested that can make that claim.

To be fair, we must point out that while this performance on the test bench is a technical achievement of considerable magnitude, it doesn't necessarily mean that the C-90 will *sound* any better than other top-quality preamplifiers. I think it is safe to say, however, that the C-90 at least ranks with the best in the field.

The C-90 has all the other virtues—great flexibility, attractive styling, solid construction, etc.—and none of the common faults of audio components. You won't hear a click or thump from it when power is switched on or off or when you switch inputs. You won't find *any* crosstalk signals from unused inputs (such as the tuner when you are listening to a low-output MC cartridge), even at maximum volume settings. We "looked" down about 130 dB without finding a trace of crosstalk! In fact, at maximum volume you will not hear *any* sound from the speakers when an MM cartridge is connected, and only a faint hiss (within inches of the speaker) in the case of an MC cartridge. That is nearly unique performance in our experience.

We do have one criticism of the C-90, and for some people it might prove to be serious. The only visible indications of most of the control settings are the tiny colored lights on the front panel. In addition to the small size of the lights—and, in some cases, of their labels—many of the lights are recessed and can be seen only from directly in front of the preamplifier. In order for a user to know which input has been selected, for example, the preamplifier must be at eye level. Aside from the hard-to-see indicator lights, the Pioneer C-90 is one terrific audio preamplifier. If you wish to control video signals as well, it is hard to imagine how you could make a better choice.

Circle 141 on reader service card



SNELL TYPE C/I LOUDSPEAKER

Julian Hirsch, Hirsch-Houck Laboratories

THE Snell Type C/i loudspeaker, though very similar in concept to the company's flagship speaker, the Type A/III, is less than half its price and considerably smaller. Both systems were designed to have a flat early-arrival frequency response and a flat power response.

The first sounds to arrive at a listener's ears—normally the direct sound from the speaker's drivers and the first reflections from the floor—provide the localization in-

formation that is basic to stereo reproduction. A speaker's power response, on the other hand, is the total sound energy from the speaker, at each frequency, that reaches the listener. It includes a near-infinite number of reflections from every room-boundary surface, all of which arrive later than the direct sound. This later-arrival component of the sound contributes to the overall tonal balance and adds the sense of space and ambience that are so necessary for realistic sound.

TEST REPORTS

The Snell Type C/i is manufactured with heavy internal wiring, polypropylene capacitors, and air-core inductors. Another Snell feature is the close matching of drivers and crossover components. The crossover components are trimmed by hand to match the characteristics of the drivers with which they will be used, so that each speaker system made matches the response of a reference speaker within 0.5 dB over its operating frequency range.

The Type C/i is a floor-standing, three-way speaker system whose 10-inch long-throw acoustic-suspension woofer has a 54-ounce magnet and a mass-loaded cone. The first crossover, at 275 Hz, is to a 4-inch midrange cone driver. At 3,500 Hz there is a second crossover to a 3/4-inch dome tweeter. The rated system impedance is 4 ohms.

The woofer is located near the bottom of the front panel, with the midrange and high-frequency drivers close to each other and horizontally aligned on a backward-sloping upper panel (the drivers are aimed slightly upward to minimize floor reflections). The left and right speakers are constructed as mirror-image pairs, with the tweeter to the outside of the midrange driver.

A second 3/4-inch dome tweeter, mounted on the rear panel of the cabinet, serves as a "supertweeter" to reinforce the response above 15,000 Hz. It contributes nothing to the direct, or first-arrival, sound of the speaker.

The input binding posts of the Snell Type C/i are recessed into the rear of the cabinet. There are two pairs of binding posts, normally connected by wire jumpers. Separating them provides access, through the crossover sections, to the woofer and midrange/treble drivers. This arrangement simplifies bi-amplification, with or without an external electronic crossover (such as Snell's Model EC-2). It also makes possible "bi-wiring" (running separate cables from the low- and high-frequency sections of the speaker to the amplifier), which is thought by some to improve sound quality.

The Snell Type C/i's cabinet, which is handsomely finished in hand-rubbed, matched oak or wal-

nut wood veneers, measures 44 inches high, 14 inches wide, and 12 3/4 inches deep. Each speaker weighs 80 pounds. The chocolate-colored grille cloth is retained by Velcro strips around its edges and is easily removable. Price: \$1,800 a pair in oak, \$1,890 a pair in walnut. Snell Acoustics, Dept. SR, 143 Essex St., Haverhill, MA 01830.

Lab Tests

We placed the speakers about 2 feet from the front wall and 5 feet from the side walls of the room. Their combined, averaged room response was very flat from 500 to 20,000 Hz, varying about ± 2.5 dB over that range. The close-miked woofer response was flat within ± 1 dB from 45 to 200 Hz, falling to -6 dB at 26 Hz.

Splicing the woofer curve to the room curve revealed a hole of about 3 or 4 dB centered at 300 Hz. The same effect was visible in a response

The Snell Type C/i sounded smooth and quite uncolored, with an obviously extended frequency response at both ends of the audio range.

curve Snell ran on our test speakers using the same techniques. Our quasi-anechoic FFT frequency-response measurements, at a 1-meter distance from the speaker, could not reveal this hole because of their limited low-frequency resolution. At higher frequencies, however, the FFT response was generally similar to the room-response curves.

The excellent phase linearity of the Type C/i system was evidenced by its group-delay variation of only ± 0.2 millisecond from 1,000 to 20,000 Hz. The minimum impedance of the system was about 3.8 ohms at 250 Hz, with its maximum of 25 ohms occurring at 28 Hz. It averaged 6 to 8 ohms over most of the audio range above 300 Hz.

The speaker's sensitivity measured 83 dB sound-pressure level (SPL) at 1 meter with an input of 2.83 volts of pink noise. At a constant input voltage of 6.3 volts, corresponding to a 90-dB SPL, the

woofer's distortion was less than 0.5 percent from 100 Hz down to 55 Hz, rising to 6.4 percent at 20 Hz.

Peak-power tests showed that the Snell Type C/i has an enormous power-handling ability. Our amplifier clipped before the speaker's output distorted significantly, at inputs of 655 watts at 100 Hz (into 5.5 ohms), 1,230 watts at 1,000 Hz (5.6 ohms), and 810 watts at 10,000 Hz (8.5 ohms).

Comments

The Snell Type C/i sounded very much the way its response measurements suggested—smooth, quite uncolored, and with an obviously extended frequency response at both ends of the audio range. Its sound quality was completely comparable with that of other speakers of the same price or higher. It appeared to impart an enhanced sense of ambience, or depth, to the sound when compared with conventional forward-facing systems. In part, the enhanced depth may have been an effect of the rear supertweeter. Whatever the explanation, it helped make this a very pleasant and listenable speaker.

The Type C/i's midrange and tweeter are approximately at ear level for seated listeners, but their upward slant makes the system's sound essentially independent of listening height. The 300-Hz hole in the measured response was not evident in listening, except in comparison with other speakers that (more typically) have a slightly elevated output in that range. Since any speaker's response at this frequency is affected considerably by room resonances, it is impossible to make a real assessment of the significance, if any, of this anomaly. Our impression is that it is no more than a minor response aberration of the sort that is present in the output of any speaker, usually to a much greater degree.

The Snell C/i is a fine speaker, very competitive in its price range. It has exceptional dispersion and overall response flatness, as well as a notably extended bass, with some very low distortion readings in the range below 100 Hz. And it looks as good as it sounds!

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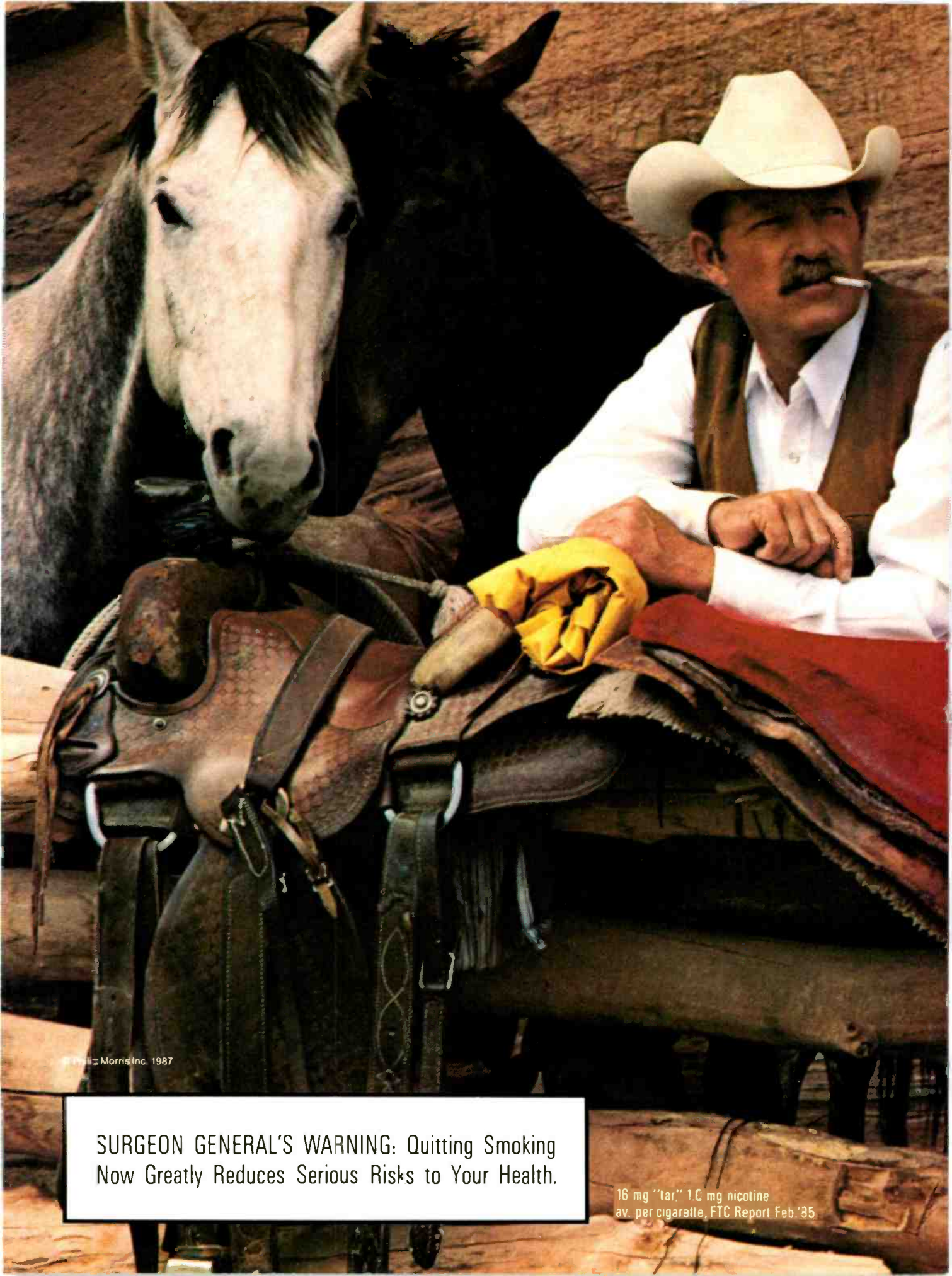
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CIRCLE NO. 29 ON READER SERVICE CARD



JOOK LEUNG

MARANTZ CD50 COMPACT DISC PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

THE Marantz CD50 compact disc player features double oversampling (at 88.2 kHz), digital filtering, and true 16-bit digital-to-analog (D/A) conversion. With one of the most sensibly arranged and easy-to-use control panels we've seen, the CD50 can be programmed to play up to twenty-nine selections in any order, and it has both fast search (with audible sound) and track-skipping capability. The repeat mode allows either a single selection, any memorized sequence, or the entire disc to be repeated indefinitely.

The CD50's display, with large, pale-green numerals, initially shows the total number of tracks on the disc. In a few seconds it changes to "0" readings for its TRACK and MEMORY indications. When PLAY is pressed, the CD50 plays the loaded

disc from its beginning, and the indicators show the current track and index numbers. In programmed playback, the display changes to show the current track number and its position in the memorized sequence. Toggling the display button switches the readout between track/index numbers, track/memory numbers, and a display of elapsed minutes and seconds in the current track.

Any track can be accessed by repeatedly pressing either the forward or backward SKIP button. Although there is no direct access to indexed portions of a recording, the fast-search mode can be used to move the laser pickup to the desired index point, which is shown on the display, and normal play can be resumed from there.

The rear apron of the Marantz

CD50 contains a subcode-output socket for use with future digital accessories, one of which might integrate video displays with the sound program. The rear panel also has two pairs of output jacks, one carrying fixed-level and the other variable-level audio signals. Although there is no front-panel level control, the CD50 is furnished with a wireless remote control that includes buttons for adjusting the level through the variable outputs. In addition to duplicating all of the player's front-panel controls except for the disc-drawer and power-switching buttons, the remote control also has a numerical keypad for direct access to any numbered track (up to No. 99) for immediate playback or programming into a memorized sequence.

The Marantz CD50, which is finished in black with gold markings, measures 16½ inches wide, 10¾ inches deep, and only 3¼ inches high. It weighs 8¼ pounds. Price: \$400. Marantz, Dept. SR, 20525 Nordhoff St., Chatsworth, CA 93111.

TEST REPORTS

Lab Tests

The output voltage of the Marantz CD50 was somewhat lower than its rated 2 volts. Driving an EIA standard load of 10,000 ohms in parallel with 1,000 picofarads, it delivered 1.65 volts from a 0-dB (maximum-level) 1,000-Hz test signal. The fixed output and the maximum variable output levels were identical, and the variable output could be reduced in 2-dB steps to essentially a zero level.

The A-weighted signal-to-noise ratio of 110 dB was among the best we have measured from a CD player. The dynamic range, relative to the total harmonic distortion (THD) from a -60-dB signal, was 96 dB. The harmonic distortion at 1,000 Hz was a bit higher than rated. The THD (excluding noise, which was negligible) was 0.046 percent at 0 dB, 0.089 percent at -10 dB, and 0.078 percent at -20 dB. It contained harmonics as high as the seventh order.

Channel separation was 87 dB at the low and middle frequencies, narrowing to 70 dB at 10,000 Hz and 64 dB at 20,000 Hz. The frequency response was flat within ± 0.1 dB from 20 to 7,000 Hz, with a

rise to a maximum of +0.5 dB at 16,000 Hz and a sharp drop to -1.2 dB at 20,000 Hz. Both channels had identical frequency responses and output levels.

The square-wave response of the CD50 was typical of machines using digital filtering. Although the manufacturer claims only 3 degrees of phase shift, this rating appears to apply only to the phase shift within one channel as a function of frequency. The interchannel phase shift rose from 2 to 4 degrees at low and middle frequencies to 39 degrees at 18,000 Hz, results consistent with the player's use of an 88.2-kHz sampling rate and a single D/A converter multiplexed between the two channels.

In our standard test of track access time, the Marantz CD50 took 7 seconds for the transition from Track 1 to Track 15 of the Philips TS4 test disc. This is relatively slow by current standards, with 2 to 4 seconds being a more typical transition time. The track cueing was excellent, even in cases where there was no silent interval between the tracks.

The defect-tracking performance of the CD50 was not quite up to the standard of most of today's CD

players. It could not track the highest level of the surface errors (black dots) or the two highest levels of information-layer damage on the Philips TS5A test disc. This does not mean that the CD50 cannot cope with normal CD's—we never experienced mistracking in playing any of our everyday CD's on this machine. It suggests, however, that slightly damaged discs, which might be playable on other machines, could be a problem on the CD50.

The resistance of the CD50 to physical shock was good on its sides, but tapping the top of the case, especially right above the transport mechanism, easily induced mistracking. We heard some mechanical sounds as the laser pick-up slewed to the next selected track, but they were not objectionable, and the player was totally silent during actual playback.

Comments

Although we could not identify any obvious cause for the CD50's higher-than-usual (for a CD player) distortion readings, we are not too concerned about them. The measured levels were so insignificant compared with the characteristics of analog records and cartridges, to say nothing of typical distortion-audibility thresholds, that they should not be a major consideration when evaluating the CD50.

The sonic advantage of 16-bit CD players over 14-bit CD players has been highly touted in high-end audio circles. We were unable to discover any audible benefit from the 16-bit conversion of the CD50, however, and we consider the matter to be far from settled.

Despite the few respects in which the Marantz CD50 failed to match the measured characteristics of some other CD players we have tested recently, its actual performance in our music system was perfectly fine. Unless you have the habit of keeping time with the music by tapping the top of the player's case or own a collection of scratched, dirty, or damaged discs, it is unlikely that you would be able to distinguish the listening and operating qualities of this machine from those of most others.

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FEATURES

- Double oversampling (88.2 kHz)
- Digital filtering
- 16-bit D/A conversion
- Programmable for up to twenty-nine selections in any order
- Repeat track, program, or entire disc
- Track skip in both directions
- High-speed scan in both directions with audible program
- Digital-subcode output on rear
- Fluorescent display of number of tracks on disc, current track and index numbers, current track and program numbers, or elapsed time on current track
- Wireless remote control for all player functions with direct access to any track (up to No. 99)
- Variable output level adjustable from remote control

LABORATORY MEASUREMENTS

Maximum output level: 1.65 volts
Total harmonic distortion at 1,000 Hz: 0.046% referred to 0 dB, 0.089% referred to -10 dB, 0.076% referred to -20 dB
Signal-to-noise ratio (A-weighted): 110 dB
Channel separation: 87 dB at 1,000 Hz, 64 dB at 20,000 Hz
Frequency response: +0.5, -1.2 dB from 20 to 20,000 Hz

Cueing time: 7 seconds
Cueing accuracy: A
Impact resistance: top, C; sides, A
Defect tracking: tracked 700-micrometer defect on information layer, 600-micrometer defect (black dot) on surface of Philips TS5A test disc



SOMETIMES THE MAN WHO HAS EVERYTHING HAS A FEW THINGS TOO MANY.

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VIDEOTAPING

HOW TO GET THE MOST OUT OF A VCR

BY WILLIAM WOLFE

If you're like most people, chances are that you use your videocassette recorder solely for playing back movies that you've rented at a local video store. But VCR's are much more than movie-playback machines. Imagine building your own library of audio/video "Great Performances" dubbed from PBS specials or editing together rock videos from MTV to make a great dance tape for your next party. You could make your own wildlife video by taping PBS's *Nature* or a *National Geographic* special and dubbing in your own music. And you can dub soundtracks or narration onto the home movies you've made with a camcorder or video camera and portable VCR combination. These are just a few of the possibilities offered by today's feature-packed VCR's.

You can get such features in both VHS- and Beta-format VCR's as well as the three table-top VCR's in the 8mm format. All three formats have hi-fi audio systems—VHS Hi-Fi, Beta Hi-Fi, and 8mm digital PCM (pulse code modulation)—and all three formats include models with built-in MTS/SAP decoders for listening to stereo TV.

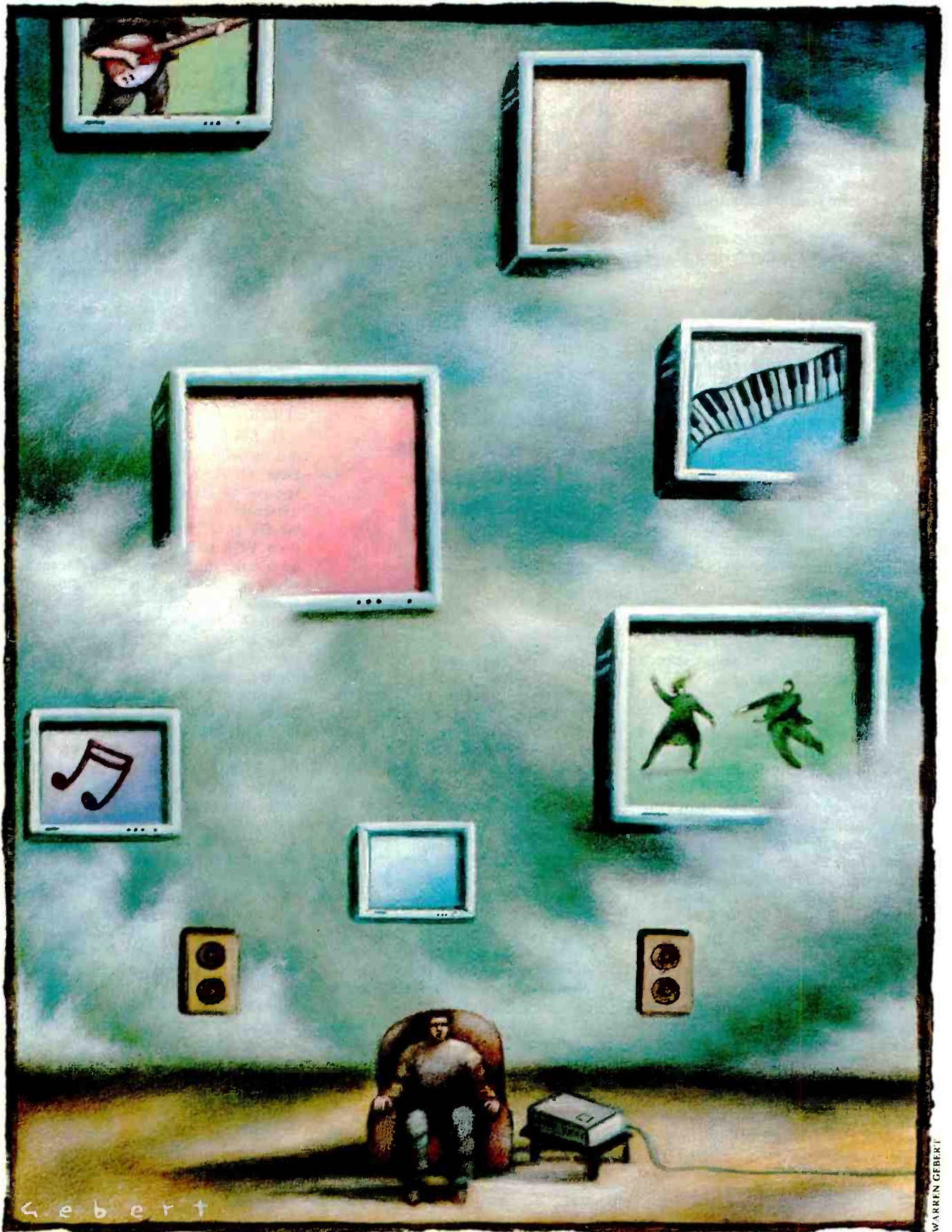
The ubiquitous VHS format has long since asserted its dominance in

America, and it remains the format of choice for video enthusiasts who want editing capabilities, top-quality audio recording, and easy access to prerecorded movies. Beta and 8mm VCR's actually offer more sophisticated editing features than any consumer VHS deck, but the scarcity of Beta and 8mm software—especially prerecorded Hollywood movies—means that Beta will be of interest mainly to hardcore videophiles and that 8mm's fate is still hanging in the balance.

Ritual Recording

You can use a VCR in any of the three formats simply to record a TV show, of course, and the process is actually easier than using an audio cassette deck. After turning on the VCR, you need only insert a blank tape, select the desired channel and the tape speed, choose the audio system you wish to record with (mono, plain stereo, or hi-fi stereo), and hit the record button just before the show begins. Some VCR's make this even easier by turning on automatically whenever you insert a videotape.

There are no record levels to set—unless your VCR has hi-fi circuitry, an override switch for its Automatic Gain Control (AGC), and manual



WARREN GEBERT

level controls. If it does, you'll want to set the level controls manually when you record music alone, without a video program, or a music-oriented TV show like *Friday Night Videos*. To set the record levels yourself, adjust the level controls—just as you would with an audio cassette deck—until the level indicators peak at the position recommended in your VCR's instruction manual.

Also, follow common sense when selecting which audio system to use. News shows and soap operas can be recorded adequately with the most basic audio system, but you should always record shows that have top-quality soundtracks, such as *Miami Vice*, with the best system your VCR has.

Tape speed is another important consideration. As with open-reel audio decks, a faster recording speed results in a higher-quality product but less program time per tape. Experimentation is your ally here. You may feel that the quality of tapes recorded at the slower speeds—EP (extended or economy play) or SLP (super long play) for VHS, BIII for Beta, EP for 8mm—is intolerably poor. On the other hand, you may find the slower recording speeds quite acceptable for everyday use and choose to use the faster speeds only for special programs.

Hands-Off Recording

A VCR can also be programmed for "time shifting," or unattended recording. The programming process may seem complicated at first, but it's really no more difficult than programming a CD player to play back several tracks in random order. First, assign a number to the show that you want to record. Then set the date on which the show airs, the time you want the VCR to begin and end recording, and the correct channel.

All this is usually accomplished by manipulating four buttons: PROGRAM or PGM activates the program timer and summons the program readout to the VCR's front-panel display. The second and third buttons, usually labeled + and -, change the information on the display—you can change the program number from 1 to 2, for example, or the start time from 11:59 to 11:55. The fourth button is usually labeled



Think of the words you can literally put into the mouths of annoying celebrities.

SET or ENTER; pushing it enters the information you have selected into the VCR's memory. Most VCR's can also be programmed to record at a set time every day of the week or a set time once every week.

The programming process has been simplified on high-end VCR's that have an On-Screen Programming feature, which displays programming information on the screen of a connected TV set or video monitor. The VCR nudges you to make the required programming choices with on-screen prompts. The only thing you have to do is hit the right buttons on the VCR's wireless remote control.

Note that some VCR's will remain in the TIMER (off) mode—and cannot be used—from the moment you set the timer until the last programmed recording concludes; then the VCR will again be ready for normal operation. It is also wise to set the timer to turn the VCR on five minutes before the show you want

to record begins and to turn it off five minutes after the show is scheduled to conclude, in case the VCR's clock is set slightly fast or slow or the preceding show is running late.

Many VCR's are also equipped with a feature called One-Touch Record (OTR) or Segment Record, which allows you to start recording with a minimal amount of button pushing—provided the VCR's power is on and a tape has been inserted. Your first push on the OTR button tells the VCR that you wish to make a one-touch recording; pushing it a second time instructs the VCR to record for thirty minutes and then shut off, and each subsequent push on the OTR button adds another thirty minutes to the recording time.

Audio Options

Hi-fi VCR's make wonderful audio recorders. Both VHS Hi-Fi and Beta Hi-Fi have a frequency response of 20 to 20,000 Hz and a dynamic range that peaks as high as 90 dB. In addition, both VHS and Beta VCR's can record up to eight hours of music on a single tape when set to record at their slowest speeds. The frequency response of 8mm VCR's with PCM audio is only 20 to 15,000 Hz, but you can use one to record up to 24 hours of digital audio on a single tape.

Using a VCR to record music is no harder than basic video recording, with two differences: an audio signal source must be connected to the VCR, and the VCR's input selector must be set to LINE. Make sure that the hi-fi recording circuitry is activated. If your VCR has an AGC override, you may want to set the input levels manually in order to capture the full dynamics of the source recording.

Some music programs and concerts broadcast on TV, and some movies or music programs supplied on cable networks, are accompanied by audio broadcasts on FM radio—though FM simulcasts, as these broadcasts are called, are becoming less common with the advent of stereo TV. A VCR equipped with an FM SIMULCAST feature can record the higher-quality FM signals. The procedure is a sort of hybrid of basic video and audio-only recording techniques.

First, connect the audio outputs

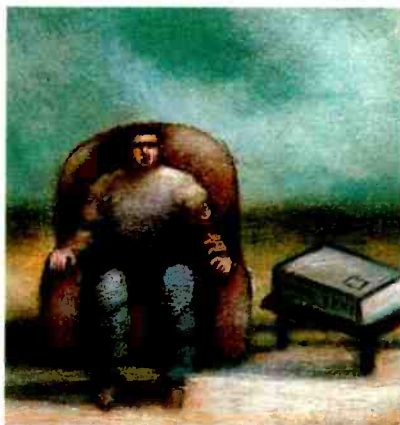
of an FM tuner or AM/FM receiver to the audio-input jacks on the back of your stereo VCR and hit the SIMULCAST (or SC) button on its front panel. The VCR will record the video tracks from its own tuner and take the audio signals from the connected stereo component.

The only way to alter the audio tracks after completing a video recording is with a feature called Audio Dub, which is fairly rare even on high-end VCR's. An audio dub records over the non-hi-fi, longitudinal mono soundtrack that is recorded at the same time as the hi-fi soundtracks (though with lower fidelity), but it leaves the hi-fi tracks intact. A front-panel switch allows you to select either hi-fi or mono sound when you play back a videotape.

You can use an Audio Dub feature to spice up tapes of baby's first steps or the cat's monthly bath by adding music, narration, or dialogue. You can also add new music to a tape that relies mostly on visuals. A friend of mine made an hour-long tape of highlights from the World Series and the Super Bowl, dubbing in such music as Queen's *We Are the Champions*. (Yes, he is a Mets and Giants fan.)

Audio Dub can also be something of a toy—or an essential tool—in the hands of aspiring video producers. Movies, news programs, music videos, or a montage of all three can be dubbed with new soundtracks. The possibilities are endless when you think of the words you can quite literally put into the mouths of annoying celebrities.

To make an audio dub, connect the audio source for the new soundtracks to the audio inputs on the back panel of your VCR. Rewind the videotape to the beginning of the section you wish to dub. Pushing the AUDIO DUB button will instruct the VCR to engage only the non-hi-fi audio head when you begin recording. Timing is the most important aspect when you are dubbing audio, and—as you'd expect—synchronizing dialogue is especially tricky. Special editing consoles are available, though they are usually too bothersome for most casual users. You can get around the dialogue quagmire when taping with a camcorder or a video camera by setting external microphones at strate-



A VCR can be the essential link for combining a love of music, movies, and homemade tapes.

gic places and recording good-quality sound to begin with.

Making Edit Points

The video editing features found on most high-end VCR's allow you to compile entire programs or choice segments from any number of separate tapes—though any video editing of this kind requires that you have two VCR's, one to provide the source signals and one to record the dubbed material.

Editing a video track is just as tricky as dubbing dialogue onto an existing videotape, but the reason has less to do with timing and more to do with the capabilities of the typical half-inch-format VCR. Most VHS models are equipped with a feature called Assemble Edit or Backspace Edit, electronic circuits that can back up the tape a short amount at the end of an old recording and start taping the new material only when they sense the clean end of the last video frame.

Some VCR's also have an Insert Edit feature, which uses similar circuitry to insert new material *within* an older recording, not just at its end. The problem with both features is that there is often a flash or even a few seconds of video noise between the edit points. Only "flying" erase heads—found on one Sony Beta VCR, one Sony 8mm VCR, and most 8mm camcorders—can erase the old video tracks at the precise instant that you are recording the new material, doing away with the gap between the old recording and the new one that you see as video noise.

To dub video footage from one tape to another, first connect the video and audio outputs of the playback VCR to the video and audio inputs of the recording VCR. Rewind the tape in the recording deck to the point where you want the new material to go and the tape in the playback deck to the beginning of the segment you wish to dub in. When you're ready to start, hit the appropriate edit switch on the recording deck and the play button on the playback deck.

Tales on Tape

Regardless of format, the brand and type of tape you put into your VCR is also important. The general rules of thumb for selecting a good audio tape apply to videotape as well. If you normally use Type I audio tape, you will probably find that "standard grade" videotapes will do just fine. If you favor Type II or Type IV audio tapes, try some of the "high grade" videotapes on the market.

Be warned, however, that the labeling on many videotape packages is confusing. Some manufacturers have half a dozen separate grades, and qualitative differences can be elusive. Your best bet is to group tapes in competitive price categories within your budget, buy a few samples of brand names you trust, and compare recordings made on them at home.

Your VCR can be more than a passive movie-playback machine. It is the essential link for combining a love of music, movies, and homemade tapes into an enjoyable and exciting hobby. The only limit—besides your budget, perhaps—is your imagination. □



IF YOU WANT
TO GET THAT
MOVIE SOUND AT
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SURROUND SOUND

BY TOM GILLETT

REMEMBER Cinerama? In the early 1950's, television kept moviegoers away in droves. So, along with innovations like 3-D, Hollywood came up with Cinerama. Three projectors provided a wraparound image that extended to the audience's peripheral vision. Meanwhile, seven soundtracks, two off-screen, surrounded the audience with sound. Later, on a more modest scale, CinemaScope and Todd-AO combined single-projection, wide-screen images with three up-front sound channels and a single surround-sound channel. Movies like *El Cid*, *Exodus*, and *Lawrence of Arabia* were filmed with surround sound. But by the early 1960's, Hollywood, and the public, had lost interest.

Ten years later, in the early 1970's, it was the audio industry's turn to discover surround sound. It was called quadraphonic sound, or quad, and it never caught on. Three competing quadraphonic systems confused consumers, demonstrations and many recordings were gimmicky, and the quad decoders of the day were easily overloaded, resulting in distortion and diminished dynamic range. The so-called "logic" circuitry that made the decoders work also introduced audible anomalies such as "pumping" and "breathing" (when soft passages get

louder, background noise and all). Audio purists tuned out.

But there were confirmed quadraphiles who grasped the proper function of quad: to provide ambience. They stuck with the system, using decoders to synthesize four channels from two. Time-delay units became, briefly, the rage—providing another way to synthesize surround sound, by delaying the front channels for a few milliseconds before sending them to the rear. Meanwhile, Hollywood hadn't forgotten Cinerama.

Enter Dolby Labs

About fifteen years ago, Dolby Laboratories and Hollywood teamed up, and the studios began to use Dolby A noise reduction for (mostly mono) film tracks. With a Hollywood connection established, Dolby turned to the development of surround sound. The first major movie to use what is now called Dolby Stereo or Dolby Surround was *Star Wars* in 1976. To date, nearly a thousand movies have been made in Dolby Stereo, and seldom, now, is a major motion picture made without some form of surround sound.

At roughly the same time that Dolby and Hollywood were pioneering movie surround sound, home videotaping was starting to catch on, although stereo sound for

ILLUSTRATION BY MARK FALLS



THE SHURE HTS-5000 DECODES DOLBY SURROUND INFORMATION AND PRODUCES SIMULATED SURROUND SOUND FROM BOTH MONO AND STEREO SOURCES WHILE PROVIDING UP TO SIX CHANNELS OF AUDIO OUTPUT. IT ALSO FEATURES REMOTE CONTROL. PRICE: \$749.



SURROUND SOUND, INC.'S MODEL SSI-360II IS A DOLBY SURROUND PROCESSOR OFFERING THREE FRONT CHANNELS, TWO REAR CHANNELS, AND A SUBWOOFER OUTPUT. ITS DELAY TIME IS VARIABLE FROM 10 TO 30 MILLISECONDS, AND IT ALSO OFFERS STEREO SIMULATION FOR MONO PROGRAMS. PRICE: \$379.95.

A DDING SURROUND SOUND TO YOUR AUDIO/VIDEO SYSTEM CAN BE VERY EASY AND EVEN RELATIVELY INEXPENSIVE.



the home video formats was slow to arrive. Owners of quadraphonic decoders quickly discovered that the same Dolby Surround channel that is optically encoded on motion-picture prints is transferred to stereo videocassettes and videodiscs. All you needed was a stereo VCR or videodisc player, a quad decoder, an extra stereo amplifier, and another pair of speakers.

Equipment manufacturers also were quick to see the light. New surround-sound processors were developed specifically for Dolby Surround. Now, there is quite an array of surround-sound decoders and simulators available, and adding one to your existing system can be very easy and even relatively inexpensive.

Not the Same Four Channels

The quadraphonic sound of the 1970's had four channels: two in front, two in back. Dolby Surround, however, has *three* channels in front—left, center, and right—and *one* mono channel in back, the surround channel, which in home installations is typically sent to two rear speakers.

Dolby Stereo (Surround) is now the *de facto* standard for the movie industry. In its most common form, four channels are matrixed into two stereo channels. The center front channel is derived from the sum of the left and right front channels. The surround channel is the difference between the left and right channels ($L - R$). Modified Dolby B noise reduction is applied to the surround channel, which is delayed 20 milliseconds or more, cut off above 7,000 Hz (to avoid the "splash" of high-frequency sibilants), and sent to the surround speakers.

A surround-sound processor licensed by Dolby carries the double-D trademark. Other units, not licensed, have circuits marked "surround" or "cinema surround" that more or less decode Dolby Surround. Results are generally okay, if there's time delay. Lack of time delay makes the old quadraphonic decoders less than ideal.

Theaters need a center channel in front to localize dialogue for the audience sitting on the sidelines. Bob Schulein, chief development engineer of Shure Brothers, Inc., makes a strong case for three front channels at home, too. "There is more information in the center

front channel than in any other channel," says Schulein. "If the idea is to duplicate the theater experience at home as closely as possible, you need the center channel."

As in theaters, a center front channel at home helps localize dialogue, particularly for those who are sitting off to the sides. But if you don't sit too far off-center, you may not need a center front channel—the left and right front speakers will fill in the information.

Many manufacturers' models have a center-front-channel output, but most people find it awkward and inconvenient to utilize. Where do you find the third front speaker and the amplifier to power it? Speakers are usually sold in pairs, and most amps are two-channel stereo. A self-powered speaker like AR's Powered Partner would be perfect, but these, too, are sold only in pairs at present.

Surround Sound from Non-Dolby Sources

All surround-sound processors have circuits that can synthesize a single surround channel from non-matrixed stereo sources. These circuits usually work like Dolby Surround. Ambience information, derived by subtracting the right channel from the left, is delayed and sent to the rear speakers. You can use this kind of ambience synthesis to derive surround sound from stereo TV programs or from CD's, cassettes, and LP's.

Most processors also enable you to synthesize surround sound from mono sources. The button is usually labeled "simulated." With this setting, some delayed mono signal is added in phase to one front channel and out of phase to the other. The delayed signal is also sent to the surround speakers. The resulting sound has plenty of spaciousness but no localization. Surprisingly, however, your eyes do a lot of localizing.

Add-Ons and Built-Ins

You don't have to run right out and buy a center front speaker, but it's nice to know the capability is there. The same goes for a subwoofer, which can also add to the fun, especially with action movies like *Indiana Jones and the Temple of Doom*.

Many subwoofers are self-powered, so all you will need is a center channel and a line-level output on



THE NEC AV-350 IS A 60-WATT INTEGRATED AMPLIFIER WITH DOLBY SURROUND, MATRIX SURROUND, AND HALL SURROUND MODES. AT THE USER'S COMMAND, THE AV-350'S 16-BIT DIGITAL CIRCUITRY DELAYS THE REAR CHANNELS BY 15, 20, OR 30 MILLISECONDS. PRICE: \$579.



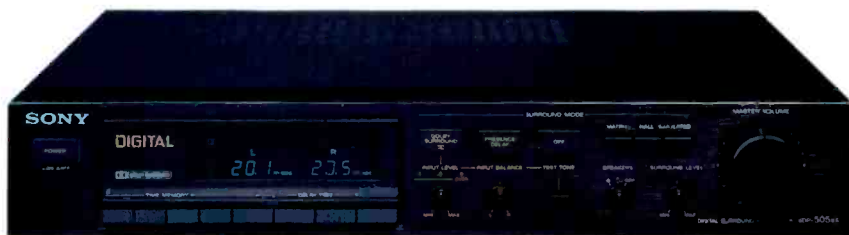
THE FOSGATE DSM 3602 360 DEGREE DIGITAL SPACE MATRIX SURROUND PROCESSOR OFFERS TWO 40-WATT CLASS A DOLBY SURROUND AMPLIFIERS, A WIRELESS REMOTE CONTROL, AUDIO/VIDEO SWITCHING FUNCTIONS, AND A BASS EQUALIZER. PRICE: \$995.



THE LUXMAN F-105 PROVIDES REMOTE-CONTROL FUNCTIONS FOR YOUR ENTIRE A/V SYSTEM. IT OFFERS FOUR SURROUND OPTIONS, INCLUDING DOLBY SURROUND, AND IT HAS A BUILT-IN 25-WATT AMPLIFIER. PRICE: \$550.



PIONEER'S SP-101 RE-CREATES SOUND AS IT NATURALLY OCCURS IN THREE VENUES—A STADIUM, A THEATER, OR A STUDIO, WITH SIMULATED STEREO FOR MONO SOURCES. PRICE: \$350.



SONY'S SDP-505ES IS A FULLY DIGITAL SURROUND PROCESSOR FEATURING FIVE DELAY TIMES, THREE MEMORY PRESETS, AND A BUILT-IN 15-WATT AMPLIFIER. LIKE A CD PLAYER, IT OPERATES AT 44.1 KHZ. PRICE: \$700.

your surround decoder. Remember, though, that some surround processors have just one mono output. In this situation you'll have to choose either a center front speaker *or* a subwoofer.

Many, but not all, surround decoders come with a built-in stereo power amp for the surround speakers. Power usually ranges from 10 to 20 watts per channel (W/ch), which is generally enough. Buying a surround unit with a built-in amp for the rear will cut down on your equipment costs and interconnectable clutter.

You might, however, gain extra features, such as remote control, by choosing a surround processor *without* a rear-channel amp. As always, features vary from model to model, which makes it important to decide what you want before you buy.

Anyone for Quad?

Don't expect record manufacturers to rush back into quadraphonic sound, although it *could* eventually happen. Shure's Bob Schulein thinks it could happen where no one's looking—through the back door, with music videos. Meanwhile, you might have more quadraphonic-encoded records in your collection than you think. Check your Angel and Columbia discs from the 1970's for SQ encoding, your Vox and Turnabouts for QS.

All surround processors extract and use some of the information encoded for quad's two rear channels, but some work better than others. Fosgate Research's Models 3601 (\$549) and DSM 3602 (\$995) do the job particularly well. In the "panorama" mode, with either QS or SQ sources, both processors will give you *two* rear channels, and both include a stereo power amp rated at 40 W/ch into 4 ohms.

Sansui's DS-77 (\$400) offers QS decoding—not surprising, since Sansui developed QS. The QS setting also does a fair job of decoding two rear channels with SQ sources as well. The DS-77 does not have a Dolby Surround setting per se, but its "cinema surround," with a fixed 20-millisecond delay, works very well. There's a 10-W/ch stereo amp for the rear speakers.

You can spend as little as \$199.95, for the Sanyo SA 100, to add surround sound to your hi-fi system. You'll get Dolby Surround with adjustable delay (15 to 30 milliseconds) and a 20-W/ch power



amp for the surround speakers. Another economical model is the AudioSource SS-One at \$290; it has Dolby Surround, adjustable time delay, and a 15-W/ch stereo amp. For \$50 more, you can get a pair of matching AudioSource LS-Ten two-way speakers for the surround channels—a very cost-effective package.

Digital Surround Processors

Among the more expensive digital surround processors, standouts include the Sony SDP-505ES (\$700) and the NEC AVD-700E (\$729). The Sony has a 16-W/ch stereo amp; the NEC has none. Digital processors instantly convert the incoming analog signal to 16-bit binary numbers, with a 44.1-kHz sampling rate, just like a compact disc. The bit stream goes to an integrated circuit that performs all signal-processing functions. The processed output is then converted back to analog.

"A few years ago, 16-bit digital audio would have been a phenomenally expensive solution," says Tony Mirabelli, marketing vice president of NEC Home Electronics. "But digital LSI's [large-scale integrated circuits] have made it an affordable reality."

The Yamaha DSP-1 Sound Field Processor (\$849) uses digital technology to create a multitude of acoustic environments. Fully deployed, the DSP-1 requires six speakers: two main (front) and four processed (two front, two rear). The DSP-1 has no built-in amp, but Yamaha's matching M-35 power amplifier (\$249) can supply two 40-watt channels or four 20-watt channels. (See Julian Hirsch's test report in the September 1986 issue.)

The Fosgate DSM 3602 mentioned earlier differs from other digital processors. To decode Dolby Surround, these other units operate in a simple matrix mode—a front-channel L - R signal is derived, subjected to digitally processed time delay, and sent to the rear speakers. In the Fosgate DSM 3602, a digital

detector monitors the incoming left and right audio channels for differences in phase and amplitude, and the processor generates control signals to reduce crosstalk between the front and rear channels.

Fully deployed, the Fosgate DSM 3602 calls for left, center, and right front speakers, two rear speakers, two side speakers, and a subwoofer. Fosgate says that the DSM 3602 is for "the serious videophile" who wants to "bring a system to an ultimate conclusion."

Surround sound can be achieved with other kinds of hi-fi products as well. There are receivers with built-in surround circuitry and surround amplification—Akai has a line of them. There are surround processors that combine the source-control flexibility of a preamplifier with surround-channel amplification. The Luxman F-105 (\$550), for instance, could almost be called an integrated amplifier. It provides all the input flexibility you could want, and it has a built-in 25-W/ch amplifier for the surround speakers and a remote control. Similar in concept are the NEC AV-350 (\$579) and the Shure AVC-20 (\$599); with these models, the built-in power amp can be used to drive the front channels, the rear channels, or both. The AVC-20 also has a built-in phono preamp and a remote control.

Whichever surround-sound processor you decide to purchase, adding surround sound will make a dramatic difference. If you already own a LaserDisc player or hi-fi VCR—or plan to buy one—your plans should include surround sound for the total audio/video experience.

Surround sound today does just what it did during that famous roller-coaster ride in Cinerama; it helps create the illusion of being there. Surround sound generates aural environments, sometimes quite subtle, that draw you into a film. The sound of wind in the trees. Traffic or crowd noise. Music in the distance. Used properly, surround sound fills a room, naturally, with sound—so naturally that you may not be conscious of it until you turn off the surround effect and hear how the sound collapses back against the wall. A moment ago, the sound was here; now it's there. You were part of an aural environment, almost a participant; now you're an observer. That's the difference surround sound makes. And I, for one, wouldn't want to be without it. □

MOVIE MUSIC

From *King Kong* and *King's Row* to *Miami Vice*, music from the movies and TV sounds better than ever on CD.

BY
STEVE
SIMELS



Young post-moderns, defined here as anybody who came of age after the hit recording *I Want to Hold Your Hand* but before President Reagan's assertion that ketchup is a vegetable, may find it hard to believe, but the idea that a movie soundtrack might make a commercially successful recording is a relatively recent one. These days, of course, suitable-for-MTV rock tunes are being shoehorned into every conceivable film package as part of the so-called "high concept" school of movie marketing, and film soundtracks are major moneymakers—sometimes more so than the films themselves (consider *FM*, for example).

But it was not always thus. In the

old days, to be sure, an occasional exception like the Richard Rodgers TV score for *Victory at Sea* might sell more than a few albums, and Max Steiner's *Gone with the Wind* music would win fans in various LP incarnations, but by and large soundtrack recordings were relegated to a ghetto inhabited by film buffs and camp cultists.

Since the 1968 release of Simon and Garfunkel's score for *The Graduate*, however, all that has changed, and throughout the Seventies and Eighties there has been a major renaissance in soundtrack recordings, with numerous megabuck hits. Among the most celebrated are John Williams's *Star Wars* trilogy, the Bee Gees' chipmunk disco *Sat-*

urday Night Fever, the Fifties revisionism of *Grease*, the country revisionism of *Urban Cowboy*, the country-rock revisionism of *Footloose*, the designer-jeans revisionism of *Flashdance*, and the current champ, the war-is-fun revisionism of *Top Gun*.

Given the flourishing market for soundtracks, however, there are fewer available as yet on CD than you might imagine. The following sampler, then, is an admittedly incomplete guide to some of the better current entries, selected alternately for contemporary hip-and-grooviness, historic importance, sound quality, intrinsic musical interest, or simply because I like the cut of their jib. See you at the movies.



PRETTY IN PINK. A&M CD-5113 (65:54).

As of this writing there are currently five hit films out with titles based on old rock-and-roll songs, but *Pretty in Pink*, the best-known of writer-director John Hughes's seemingly endless attempts to catalog the adolescent insecurities of today's teens, is perhaps the masterpiece of its kind. The title song, of course, is courtesy of the Psychedelic Furs, those angst-ridden darlings of the college-radio set, but their version here, sad to say, lacks the ironic nastiness of the original. The CD's big hit comes from Orchestral Manoeuvres in the Dark, whose *If You Leave* is slightly sappier than anyone would expect from those usually austere synth-popsters.

The crucial track, on the other hand, comes from neo-folkie Suzanne Vega. *Left of Center*, featuring Joe Jackson on piano, is by far the best thing Vega has ever done, a glacially eerie electronic rocker that brings her Joni Mitchell-for-the-Eighties shtick into far clearer focus than anything on her otherwise estimable debut album. And the whole CD is a nice sonic showpiece.

into our collective unconscious. Oddly, though, it is only in recent years that large numbers of people have acknowledged that one of the film's most crucial elements is the splendid music by Max Steiner. A virtuoso mishmash of the late-nineteenth- and early twentieth-century styles, *Kong* was one of the first



Berlin's Terri Nunn stands tall in war-is-fun film hit *Top Gun*.

movie scores in which the composer was given the freedom to influence the film's visual components (rather than the other way around). Oscar Levant once observed that the film should have been advertised as a concert of Steiner's music with accompanying pictures, and he was not being ironic. Fifty years later, the music still packs a wallop. And this great-sounding mid-Seventies analog recording, conducted by the composer's son, serves it very well.

SISTERS (Bernard Herrmann). SOUTHERN CROSS SCCD 903 (42:39). **ALFRED HITCHCOCK'S FILM MUSIC (Bernard Herrmann).** MILAN CD 022 (48:38).

The late Bernard Herrmann was probably the most innovative and original of all the old-time Hollywood composers, and his credits include some of cinema's most memorable scores—*Citizen Kane*, *The Devil and Daniel Webster*, *The Day the Earth Stood Still*, and a host of others. Surprisingly, he is somewhat underrepresented on CD, especially his bone-chilling output for Alfred Hitchcock. The Hitchcock CD here features a composer-conducted suite from *Psycho* coupled with a slightly undernourished run-through of excerpts from *North by Northwest* conducted by Laurie

Johnson. It's good, but it will mostly whet your appetite for lengthier shots of the real stuff. Better is the CD derived from Brian DePalma's homage to Hitchcock, *Sisters*. Herrmann's music added a much-needed credibility to DePalma's somewhat contrived thriller, and the score, as unconventionally orchestrated as usual for him, is among the composer's best.

MISHIMA (Philip Glass). NONESUCH 79113-2 (46:07).

I happen to be one of those malcontents who think that writer-director Paul Schrader is, despite his impressive résumé—*Taxi Driver*, *American Gigolo*, *Raging Bull*—a cinematic half-wit who couldn't tell a coherent story if his life depended on it. Nevertheless, for his artsy bio-pic of the controversial Japanese novelist and ritual suicide Yukio Mishima, Schrader did a very smart thing: he commissioned a score that doesn't sound remotely Japanese. Instead, he turned to Philip Glass, who responded with music in which he reintroduces, however tentatively, a lot of the elements (melody, harmonic development, drama) that he usually leaves out. The result is undeniably powerful, and it's stunningly engineered and played. This CD might be described as the Philip Glass album for people who hate Philip Glass.



Elsa Lanchester played the bride of Frankenstein to music by Franz Waxman.

EDDIE AND THE CRUISERS. SCOTTI BROTHERS/CBS ZK 38929 (39:20).

Probably the only rock-oriented film in memory whose songs are



Director Alfred Hitchcock often worked with composer Bernard Herrmann.

KING KONG (Max Steiner). SOUTHERN CROSS SCCD 901 (48:00).

The poignant saga of an ape and his girl, *King Kong* is the kind of film that drives auteurist critics nuts: it is, after all, a sterling example of the kind of collaborative film making that exemplifies the old studio system at its best and one that has long since passed from being a mere classic and moved directly





PAUL RIDER/RETINA LTD.

Suzanne Vega's *Left of Center* is a highlight of *Pretty in Pink*.

integrated in a manner that makes dramatic sense. *Eddie and the Cruisers* mixes an attractive bunch of Springsteen-derived tunes with a well-done rock-noir story, in the process becoming a genuinely poignant meditation on lost innocence. A major bomb when first released, the film attracted a totally unexpected audience when it played on HBO, belatedly pushing the soundtrack to the top of the charts and making stars of its songwriter-performers, John Cafferty and the Beaver Brown Band. Yes, it's derivative as hell, but it evokes its early-Sixties era with a lot of flair, and it hangs together as an album surprisingly well. A great party CD.

KING'S ROW (Erich Wolfgang Korngold). VARÈSE SARABANDE VDC 47203 (48:11).

According to reliable sources, one of the reasons for the breakup of Ronald Reagan and Jane Wyman's marriage was the former's penchant for screening *King's Row* whenever they had company over. In fairness to the President, however, it should be said that he can be justifiably proud of his performance in this ahead-of-its-time look at the dark underside of small-town American life. It should also be said that the score by Erich Korngold is one of the glories of old-school Hollywood film composing—gorgeously melodic, luxuriantly orchestrated, and a magnificent romantic wallow. John Williams pilfered from it liberally for both his *Star Wars* and *Superman* music, but the original—especially in this stunning all-digital CD by the National Philharmonic

under Charles Gerhardt—is still the greatest. A must have.

STAR TREK, ORIGINAL TELEVISION SOUNDTRACKS (Alexander Courage). GNP/CRESCENDO GNPD 8006 (43:40).

And they really mean the *original* television soundtracks. For the first time ever, complete and unedited from the tapes made at Desilu Studios in 1965, here are the scores of the two celebrated pilot episodes of the galaxy's longest-running space opera. Composed by Alexander Courage, the man responsible for the familiar *Star Trek* theme song, the music may lack the symphonic sweep that Jerry Goldsmith and James Horner provided for the more recent *Trek* feature films, but Courage's canny orientalisms and near-subliminal use of electronics have a naïve flair that is irresistible. If, as one critic observed, the main virtue of the TV show was its "charming fatuousness," then this music certainly has the same attraction. The remastered recordings not surprisingly betray a certain amount of tape hiss and distortion, but given the way we originally heard this music—on a five-inch television speaker—that only adds to the authenticity of the home-listening experience. Tons of fun.



Cheap trick (from left, Jon Brant, Rick Nielsen, Robin Zander, and Bun E. Carlos) contributes a track to rock-and-roll recruitment film *Top Gun*.

MIAMI VICE. MCA MCAD-6150 (43:14).

It says a great deal about the way the TV business operates that the entire phenomenon of *Miami Vice* was initially brainstormed around the two-word concept, MTV cops—but what it says is perhaps too terrible to contemplate. No matter. The

show is one of the few oases of high style currently available on the tube, and who among us can resist a series with the chutzpah to cast G. Gordon Liddy, Charles Ludlam, and Iggy Pop in supporting roles? Not I. And I love the show's use of music, which is perhaps the loudest on television to date. The *Vice* CD offers generous helpings of Jan Hammer's ultra-hyper synthesizer instrumentals and plenty of sun-baked hits by Phil Collins, Glenn Frey, and Tina Turner. It's all as flashy, melodramatic, and ultimately insubstantial as the show itself, but if it's realism you want, watch *Crime Story* (which, come to think of it, is produced by the same people). In any case, the *Miami Vice* CD is the very model of a modern soundtrack album.

SUNSET BOULEVARD: THE CLASSIC FILM SCORES OF FRANZ WAXMAN. RCA RCD1-7017 (68:51).

Franz Waxman, a European emigré like Max Steiner and Erich Korngold, was one of the most versatile composers during Hollywood's Golden Age, a man who scored horror pictures, soap operas, historical epics, *films noirs*, and sophisticated comedies with equal facility. Perhaps his best-known mu-

sic was written for James Whale's masterly black comedy *The Bride of Frankenstein*—in part because Universal lifted it intact for a number of its serials, including *Flash Gordon*—but he got his name on quite a few classic pictures, among them Billy Wilder's brilliant *Sunset Bou-*
(Continued on page 114)

MICHAEL PUTLAND/RETINA LTD.



BOSE AM-5 SPEAKER SYSTEM

Superb sound and virtual invisibility characterize a three-piece system designed for today's living spaces.

BY JULIAN HIRSCH

WHEN Dr. Amar Bose introduced the original Bose 901 Direct/Reflecting speaker in 1968, he sent shock waves rippling through the audio industry. The speaker challenged all the laws of conventional speaker design at the time by emitting sound from the back as well as the front—and it went on to become one of the best-selling loudspeakers ever. Around the same time Bose also introduced his “audio magic act,” his way of demonstrating a new product by first letting you hear its “magical” sonic abilities, then giving you the cold, hard acoustical facts behind the design.

Nineteen years and three major performances later, Bose has done it again by introducing the AM-5 (the AM stands for Acoustimass), his first subwoofer/satellite system. Like his three interim projects—the Acoustic Wave Music System, the Delco-GM/Bose automotive system, and the recent Zenith/Sound by Bose television sets—the AM-5 performs some truly amazing sonic feats, offering a novel technological approach to an old audio design problem.

The old problem here is how to get realistic bass response from a speaker system without using large, visually obtrusive enclosures. One solution is to use a pair of small speakers, called “satellites,” along with a separate bass module located nearby. We have tested and reported on a number of such three-piece systems over the years. As a class, they usually deliver a sound quality well beyond what their size and price would suggest, and the new Bose AM-5, with a suggested list price of \$699, is certainly in that tradition.

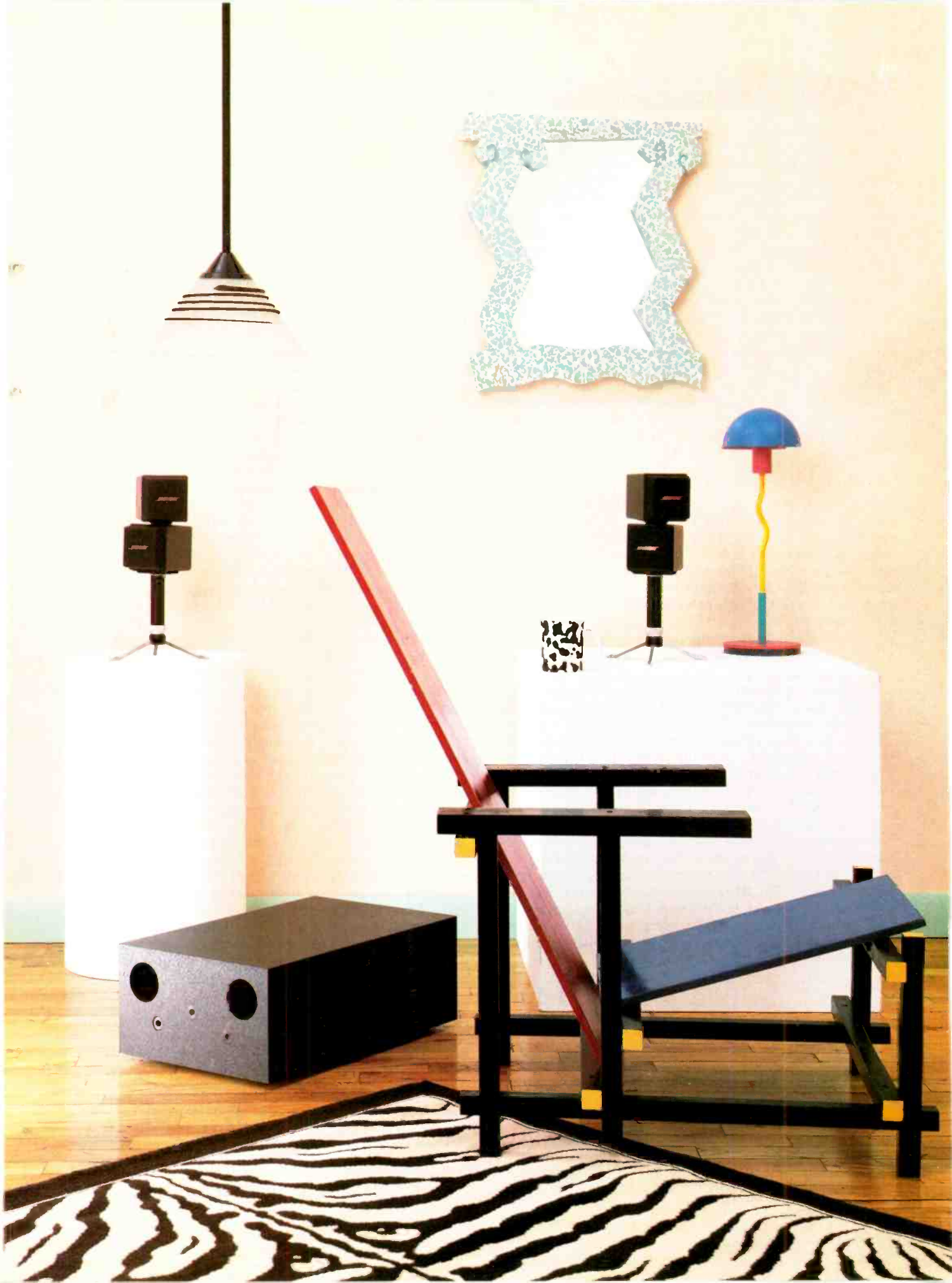
For some reason, however, satellite/subwoofer systems have never attained the popularity of conventional stereo speaker pairs. In part, this may be because the bass module in most such systems, often styled and finished to resemble a small table or similar piece of furniture, is still too visible. When stereo was introduced twenty-five years ago, many people found it hard to adapt their homes to a *two*-speaker arrangement, and there can be similar resistance to the idea of accommodating a *third* speaker, however unobtrusive the first two may be.

The new Bose system recalls the first three-piece system I can remember hearing, the Weathers company's “Harmony” of 1960, which had satellite speakers about the size and shape of a hardcover book and a “hide-away” bass module that was meant to be placed behind or beneath a piece of furniture. With a crossover in the 70- to 100-Hz range, the bass module usually could not be sensed as a distinct sound source, nor was its out-of-the-way location obvious to a listener. The Bose Acoustimass bass module goes much further: it can be placed *anywhere* in the room and will defy you to locate it by ear alone.

Direct/Reflecting “Cubes”

The satellites in the Bose AM-5 system are called “cubes,” and with good reason. Each consists of two small, black cubical enclosures, which are normally mounted one above the other but are separable for installations where that might be desirable. Each cube weighs only 1¼ pounds and measures 3½ inches on a

PHOTO: ROBERT LORENZ, PROPS COURTESY HOT HOUSE



side, with an additional 1-inch extension for the grille.

The rear of the lower cube of each pair has spring-loaded connectors that accept the stripped ends of the speaker wires and a slide switch marked DIRECT/REFLECTING. The upper cube rotates freely through 360 degrees, pivoting on an integral 1/4-inch phone plug that fits into a jack on the top of the lower cube. When the cubes are unplugged from each other, an extension cable allows them to be placed as much as 4 feet apart.

Each cube contains a single 2 1/2-inch cone driver whose shielded magnet permits the cube to be placed on or adjacent to a TV set without affecting the picture. The nominal system impedance is 4 ohms. Since the rated crossover frequency to the bass module is 150 Hz, the four tiny cubes actually generate most of the audible program sound. The slide switches on the two lower cubes slightly alter the level balance between the cubes in each pair to maintain a uniform room response when the top cube is turned away from the front axis for the "reflecting" mode of operation.

Acoustimass Bass Module

The bass module, which also contains the crossover network and the system's protective devices, is a 20-pound box finished in flat black that measures 20 inches long, 12 inches wide, and 8 inches high. It is basically a two-chamber Helmholtz resonator, with each chamber tuned to a different resonant frequency. The front and rear sides of a pair of 6 1/2-inch cone drivers excite the two resonators, which are ported to the room through individual 2 1/2-inch-diameter openings on one of the small ends of the box. The drivers are completely enclosed within the bass module and are not visible.

The resonant frequencies of the two volumes within the bass box are approximately 45 and 90 Hz, and their "Q" values were selected to provide a relatively uniform output over that range. Although the propagation of these low frequencies depends somewhat on the listening room's dimensions and the exact placement of the bass module, the system is designed to give best results with the bass box along a floor/wall junction.

The protective system of the Bose AM-5 consists of a combination of bistable resistors and positive-temperature-coefficient thermistors that instantly reduce the power delivered to the drivers when the input level becomes excessive. Although the system is rated at 165 watts maximum, we heard a convincing demonstration that it could tolerate short-term inputs of many hundreds of watts without damage and without unreasonably high distortion levels.

The cases of the bass module and the cubes are tapped for mounting screws and brackets (not furnished), and the system is furnished with all necessary interconnecting cables.

The Measurements

For most of our measurements, as well as for listening, we placed the Bose AM-5 satellites 6 feet apart, about 4 feet from the floor, and 2 feet in front of the wall behind them. The bottom cubes faced forward, and the top cubes were angled outward and back about 45 degrees to provide the greatest spread of the stereo sound stage.

We also took advantage of the small size of the cubes by placing them in a variety of possible locations, as well as by experimenting with fully direct and partially reflected sound. The bass module was placed on the floor under a table about 3 feet to the right and slightly forward of the right speaker cubes (its ports were approximately in the same vertical plane as the cubes).

The averaged room response of the complete system varied only ± 3 dB from 250 to 16,000 Hz. There were the usual response irregularities at lower frequencies because of standing-wave patterns in the room. The bass module's output was measured with the microphone close to the box and midway between the two ports. The resulting response curve peaked at 66 Hz and varied within $+5$, -0 dB from 55 to 150 Hz. It fell off at 24 dB per octave above and below those frequencies. A close-miked response measurement of one of the cubes showed moderate irregularities, about ± 4 dB, up to 10,000 Hz and a very sharp drop in output (about 30 dB per octave) below 300 Hz.

When we attempted to splice the room curve to the close-miked bass curve, it was apparent that there was a "hole" at about 200 Hz in the upper-bass (or lower-midrange) response. The response in this region, however, is normally highly dependent on room characteristics and speaker placement, and some rough checks in our room indicated that it could vary considerably with different placements of the cubes and the bass module.

The system's sensitivity, measured at 1 meter from one of the satellites, was 87 dB sound-pressure level (SPL) with an input of 2.83 volts, about average for small speaker systems. Achieving the reference 90-dB SPL that we use for bass-distortion measurements required a 4-volt drive signal. The distortion measured between 1 and 1.5 percent from 55 to 150 Hz, rising to 5 percent at 45 Hz and 10 percent at 41 Hz. Although these results are roughly comparable to what we have measured on other systems of similar size, they are not unusually low



How does Bose work the magic of making the bass module invisible? Well, of course, it is not magical at all, although it might seem that way. According to Dr. Amar Bose, studies have shown that the localization of bass sounds (undesirable in three-piece systems or those using a subwoofer to provide bass

INVISIBLE BASS

extension) occurs principally through harmonics of the bass fundamental. A pure bass note, especially in the range below 100 Hz, is very difficult to localize. If, however, the note has any significant harmonic content (at frequencies up to several hundred hertz), this will provide the clues a listener needs in order to detect the direction of its source.

One way to minimize a woofer's harmonic output is to use a bass system

whose distortion is inherently very low. This is the approach used in some large, expensive subwoofer designs. Another approach—the one taken by Bose—is to use a less expensive acoustic design that simply doesn't radiate the undesired harmonics. Because of the AM-5's low crossover frequency to the satellites, the middle- and high-frequency components of a complex musical sound invariably localize the entire sound source at the satellite posi-

compared with the bass distortion of larger conventional speakers. On the other hand, unlike three-piece systems, conventional stereo speakers have no special requirements for avoiding bass localization—in fact, such localization may be a *desirable* quality in them.

The system's impedance was a minimum of 4.5 ohms at 180 Hz and averaged 6 to 9 ohms over most of the audio frequency range. Its maximum of 25 ohms occurred at 40 Hz. Recalling how easily the speakers seemed to deal with huge peak inputs when we first heard them, we anticipated excellent results from our pulse-power tests. And we got them: the Bose AM-5 system did not show audible distress at *any* of the three test frequencies (100, 1,000, and 10,000 Hz) until the amplifier clipped—at outputs of 1,150, 930, and 880 watts!

The Sound Stage

To us, the two most noteworthy features of the Bose AM-5 are its superb sound and its virtual invisibility—which, with a little ingenuity, can be *total*. We were introduced to the AM-5 at the Bose plant in a typical listening-room environment, but with no visible signs of any speakers. The sound we heard was silky smooth and full-range, with a strong and room-filling bass, airy highs, well-balanced overall response, and an impressively integrated overall quality.

Recalling the Weathers system, my first thought was that small speakers were concealed in the bookcases that faced the listening position. The books proved to be genuine, but the mystery was solved when a couple of potted plants were removed to reveal the two tiny satellites hidden behind their leaves!

The bass module turned out to be behind a sofa along the side of the room, well removed from the satellite speakers and completely to one side of them. Had its location not been revealed to us, a thorough search would have been required to locate it. Unlike most three-piece systems we have heard (including the one that has been part of my own home music system for a number of years), the Bose AM-5 bass module simply could *not* be localized by listening—except by placing an ear near one of its ports!

We confirmed our impressions from the factory demonstration in our own tests of the system. We held the bass module in our hands and walked around the room while listening to the system. The bass sound remained firmly “up front,” integrated with the rest of the spectrum and audibly appearing to come from the satellite cubes. When the cubes were not visible, as in the Bose demonstration, the sound stage was just “there” across

the appropriate wall of the room. It was an extremely uncanny sensation.

No one in our acquaintance who has heard these speakers has failed to be amazed and even awed by their performance. No, the Bose AM-5 is probably not “better” than a number of far larger and more expensive speakers one might name, but it is certainly competitive with most of them, and for many people it might well be the speaker of choice. In our listening room, side by side with speakers costing three to five times as much, the AM-5 consistently produced the more exciting and listenable sound in A/B tests.

Hearing Is Believing

The AM-5's sound has an openness and breadth that must be heard to be believed. Switching to any conventional forward-radiating speaker system collapses the wall-to-wall sound stage in a most discouraging manner. Although we used the reflecting mode for the satellite cubes most of the time, the system also sounded excellent when they were all facing forward. The speaker's subjective frequency response also sounded unlike others we are used to, probably because of the upper-bass “hole” in a region where many speakers have a peak.

But we cannot think of the AM-5 solely in terms of frequency response, distortion, or any other measurable parameter. More than almost any other speaker in recent memory, it has been sheer fun to listen to, by virtue of its wide sound stage and room-filling bass, which manages to sound so much deeper than it can possibly be coming from a system of its size!

Perhaps a part of the system's charm is the obvious dichotomy between what we see and what we hear. Everyone “knows” that four 2½-inch speakers *can't* fill a room with superb full-range sound (probably for the same kind of reasons that someone once “knew” a bumblebee couldn't possibly fly, given its ratio of wingspan to mass). And it matters not a whit that you can look at the bass module, pick it up, walk around the room with it, and so on. Other than an occasional slight vibration in your fingers, you still won't have a clue that the bass you hear is not coming from those tiny cubes up front, impossible as you know that to be.

Anyone who has had to compromise in speaker selection because of aesthetic considerations should hear the Bose AM-5. It is hard to imagine a room that could not accommodate it, and you'll never have to apologize for the sound. In fact, you may wonder why you ever wanted one of the other, more “ordinary” two-piece loudspeaker systems. □

tions and (as with any stereo speaker system) through the region between them. In addition, when the top cubes are aimed toward the wall behind them, the sound stage becomes deep as well as wide.

To understand how all this is done, you must realize that the double-resonator bass module of the AM-5 is analogous to a double-tuned transformer like those used in the IF stages of tuners and receivers. Such transformers

provide a bandwidth wide enough to pass the desired signal components as well as the selectivity needed to reject unwanted signals. The Bose bass module uses the same operating principle.

No matter how steep the cutoff slope of the woofer's crossover network might be, it can have no effect on its radiated harmonics, which are created in the speaker drivers. But the bass module's dual-resonator design inherently attenuates the radiated acoustic output

above a certain frequency, so that distortion generated in the speaker drivers will not emerge from the output ports—more accurately, it will be radiated at a much lower level than otherwise. According to Bose, it is this quality of the AM-5's bass module that endows it with its acoustic “invisibility.”





CES

SHOW STOPPERS

Just as you shop for exciting new components in retail stores, audio and video dealers shop for hot new products from manufacturers at the twice-yearly Consumer Electronics Shows. Journalists also get pre-views of things to come, and we look—and listen—for new and exceptional audio and video products.

The CES in Las Vegas this past January was an audiophile's dream, with everything from tape to speakers on display. Sorting out the treasures, we found fifteen "show stoppers," new audio products that are truly outstanding in the areas of technology and design. Other noteworthy components soon to appear on dealers' shelves will be covered in our "New Products" section and in test reports.

Many manufacturers were showing "prototype" DAT (digital audio tape) recorders, and rumors about plans to market these machines were spreading like wildfire. At press time, they had just been introduced in Japan, and American sales cannot be far behind.

The products shown here, special as they are, illustrate current trends in audio and video. Compact disc changers were led by a Sanyo prototype (the CPM1000) that plays ten discs without a special magazine. Other players had innovative features at lower prices than ever.

Sound for video continues to improve, and there were more audio/video receivers at the show than in previous years. A new Nikko receiver even had a built-in video tuner with MTS decoder. And whole new lines of electronic components were previewed by both Acoustic Research and Dual.

CES is not always the best place to listen, but we heard musical sounds from new speakers by Allison, Boston Acoustics, Clements Audio, Genesis, and Infinity as well as the mountainous Everest speakers from JBL. Subwoofers old and new were booming out from at least twelve manufacturers, among them Martin-Logan and American Acoustics.

Denon, Blaupunkt, and others showed new, different, and well-designed car stereo components, while Sony introduced a "Mega Bass" CD boombox.

The biggest news in video was JVC's announcement of Super-VHS, a picture-enhancement technique for VCR's said to produce better resolution than broadcasts. Video trends were toward camcorders, especially VHS-C, and more digital VCR's with more and better special effects. Take a look—and a listen—at your local consumer electronics store for the latest and the greatest in audio and video.

by WILLIAM BURTON

With digital audio and laser-sharp resolution, Pioneer's LD-S1 LaserDisc player (facing page, top) can create sound and pictures so good you might think they're real. Picture quality is enhanced by fully floating disc rotation and Accu-Focus to reduce RF distortion, yielding 420-line resolution and low noise. Digital video effects include freeze-frame with sound and fast scan with no picture interference. Retail price of the remote-controlled LD-S1 will be around \$2,000.

Sony's unique CDP-C5F CD changer (facing page, bottom) holds five compact discs on its rotating carousel. While CD changers were all over Las Vegas, the Sony player is easier to load than those requiring disc magazines. Between playings, you store the discs in their protective jewel boxes. Suggested retail price is \$450.



PHOTOS BY HING, NORTON



The SAE A502 stereo power amplifier is rated for 200 watts per channel into 8 ohms, but flipping a rear-panel switch bridges the channels so that it can deliver 600 watts in mono. A front-panel switch changes the response time of the power-output display from fast to slow. Switching is provided for two pairs of speakers. The high-current A502 is designed to handle low-impedance loads and is said to be able to drive any speaker system available today. Price: \$699.

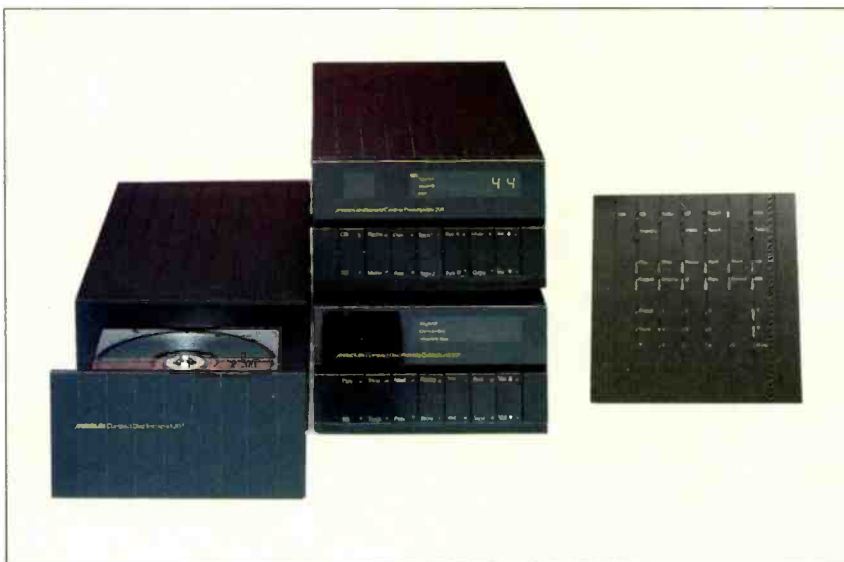


THING/NOKTON

As part of its move toward offering a full line of audio components, NEC showed the AVR-1000 audio/video receiver. It combines four channels of amplification (100 watts each for two front speakers, 50 watts each for two rear ones), Dolby Surround and matrix decoding, and a remote control that can also work with other NEC components. Relative volume of the four speakers is set with a single four-part control. The AM/FM receiver can switch CD, phono, audio tape, video, and auxiliary sources. Price: \$869.



The Model 201 preamplifier (center top, \$900) is the heart of Meridian's remote-controlled audio system, which can be extended to play different music in different rooms. It has a sixty-four position electronic volume control that can be programmed to match the levels of various sources. The remote control (right, \$110) is the same width as Meridian's other 200 series components, such as the two-piece Model 207 CD player (transport section at left, electronics section at center under the preamp) and the Model 204 tuner/timer and Model 205 power amplifier (not shown). The remote control can switch up to eight input sources, operate tuning and CD programming functions, and adjust volume.





Each Design Acoustics PS-103 speaker (above, far left) has two separate enclosures. The upper enclosure houses a $\frac{3}{4}$ -inch dome tweeter and a 6-inch midrange mounted in a low-diffraction baffle that is said to create unusually precise stereo imaging. The 10-inch woofer in the bottom enclosure fires down and radiates from a slot all around the bottom. Price: \$900 per pair.

A new line of Yamaha speakers designed to measure well and to satisfy critical listeners includes the NS-A-7.2 bookshelf model (above, center), with a 7-inch polypropylene woofer and a $\frac{3}{4}$ -inch soft-dome tweeter. The woofer is tuned for a resonance of 37 Hz to extend the bass response, and the tweeter is designed to avoid shrillness and resulting listener fatigue. Price: \$218 per pair.

Two video trends—hi-fi sound and camcorders—finally came together in the Zenith VM7100 (above). It uses a full-size VHS cassette, for up to 8 hours of recording, and weighs only 5 $\frac{1}{4}$ pounds without its battery pack. It can play and record in hi-fi stereo and record stereo TV broadcasts from any TV set equipped with an MTS decoder. Price is approximately \$1,795.

The .7 High Definition Monitors from Focus (left) are said to re-create the recorded three-dimensional sound stage with "uncanny" precision. To reduce cabinet coloration, the enclosures are made of a seamless tube of braced "Pox Pulp." Each ported speaker has a 1-inch dome tweeter time-aligned with an 8-inch woofer. Price: \$995 per pair; optional stands, \$195 per pair.

HUNG/NORTON



Toshiba's DX-900 videocassette recorder has digital audio, digital video, and on-screen light-pen programming. It can handle five different audio channels—two PCM digital, two VHS Hi-Fi, and one longitudinal ("normal"). Digital picture processing enables viewers to freeze up to four images on the screen at the same time. To program the VCR to record in your absence, you simply touch the fiber-optic light pen to colored graphics of calendars and clocks on the screen. Tentative price is \$1,399.



The NAD 6300 cassette deck has four signal-processing circuits and a full-function remote control. Dolby HX Pro and Dyneq headroom-extension circuits improve high-frequency response at high levels, while Play Trim corrects losses of highs from any tape. A "CAR" processor compresses dynamic range for mobile listening, boosting low-level signals by approximately 20 dB. Price: \$798.



Just slip five compact discs into the five thin trays in Fisher's DAC-205 CD changer and you're set for an entire evening of music. You can hear each track of each disc in sequential order, or you can program up to thirty-two tracks in any order you want, or you can press "Random Play" and let the machine do the programming. The remote-controlled changer is \$499.95.



The four-channel PQ10 car stereo amplifier from ADS can be treated as two stereo power amps put together. In its four-channel mode, it delivers 30 watts into four speakers; with one of its stereo amps bridged, it will power two satellites (30 watts each) and a sub-woofer (80 watts); and with both amps bridged, it provides 80 watts apiece for two speakers. The compact amplifier is designed to work with virtually any head unit. Price: \$410.



Also in car stereo, Proton's 214CD autoreverse cassette receiver is noteworthy for having inputs for a CD player on both the front and rear panels. Schotz circuitry in the tuner section is said to improve FM sensitivity and reduce overload, distortion, and static. Price: \$349.



Separates in the high-end Citation line from Harman Kardon—consisting of a preamplifier, two power amps, and the Model twenty-three tuner at left—are finished in blue-black anodized brushed aluminum with molded rubber trim. The remote-controlled tuner has a patented Active Tracking system that is said to give it high selectivity in both mono and stereo. Price: \$650.



Once again, AR reshapes the future of high fidelity.

No longer do you need to live with components that look more at home in a power station than in your home. No longer need you sacrifice sound quality for some semblance of sound design.

AR, the company that revolutionized loudspeakers with the Acoustic Suspension design, now changes the face of stereo components forever. By combining world-class industrial and electronic design, AR has produced the first audio components as pleasing to the eye as they are to the ear.

The front fascias are gracefully angled, so controls fall readily to hand. Behind a hinged panel, infrequently-used controls are ready when you need them, out of sight when you don't.

AR has reexamined the factors that

really matter to sound quality. That's why AR amplifiers produce high current output for outstanding dynamic headroom. Four-times oversampling gives the AR Compact Disc player absolute phase linearity. And AR's unified remote control adds a final touch of elegance.

No one serious about stereo would buy equipment without listening. Now it's no longer necessary to buy without looking.

AR
ACOUSTIC
RESEARCH

We speak from experience.



F.R.E.D.TM BREAKS THE SOUND BARRIER IN YOUR LIVING ROOM



TURN YOUR ORDINARY TV INTO AN MTS STEREO-SONIC SUPERSYSTEM

Now that the networks—NBC, ABC, CBS and even Cable—are broadcasting dozens of programs in dynamic stereo sound you can change your home TV viewing from dull to dynamic with one of Recoton's F.R.E.D.TM Family of MTS Decoders. Easy to install, each F.R.E.D. Decoder thrusts the sound and action beyond your TV screen, delivering theater-like sound that's purer and cleaner than the best Stereo TV on the market. Leading authority on audio Julian Hirsch commented in STEREO REVIEW Magazine, "F.R.E.D. ... is a dramatic improvement in the quality of TV sound... can justify its addition to a home entertainment system." VIDEO and VIDEO REVIEW Magazines also agree the F.R.E.D. family of decoders transforms your ordinary TV into an up-to-date stereo center at a fraction of the cost of a new MTS Stereo TV. And F.R.E.D. also synthesizes dynamic stereo sound from non-stereo broadcasts. Available in amplified and non-amplified versions for use with a home audio system or self-powered speakers. Some models with SAP bi-lingua programming capability. So experience the F.R.E.D. family—the greatest breakthrough in MTS Stereo technology.

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VHS TABLE-TOP VCR'S

AKAI

VS-565U Hi-Fi Videocassette Recorder
VHS-format table-top VCR with hi-fi stereo sound. Features built-in 10-W/ch amplifier with electronic volume control; HQ circuitry; MTS-SAP stereo tuner; four heads; 6-event, 14-day on-screen programming; 107-channel cable-ready tuner; 32 station presets; wireless remote control with direct access; variable slow motion; programmable from remote; child lock system; comb filter for high-definition picture; auto power-on, rewind and editing \$749
VS-555U. Similar to VS-565U except does not include amplifier and volume control \$699

VS-525U Hi-Fi Videocassette Recorder
VHS-format table-top VCR with hi-fi stereo sound. Features built-in 10-W/ch amplifier with electronic volume control; HQ circuitry; MTS-SAP stereo tuner; two heads; 6-event, 14-day on-screen programming; 107-channel cable-ready tuner; 32 station presets; wireless remote control with direct access; slow motion; child-lock system; comb filter; automatic power on, rewind, and editing functions \$629
VS-515U. Similar to VS-525U except does not include amplifier and volume control \$579

CANON

VR-HF720 Hi-Fi Videocassette Recorder
VHS-format table-top VCR with hi-fi stereo sound. Features HQ circuitry; MTS/SAP decoder; 4 video heads; 30-day/8-event on-screen programming; 107-channel cable-ready tuner; 3-speed playback; slow-motion playback variable from one-fifth to one-thirtieth normal speed; one-touch recording; 4 audio outputs; FM simulcast; index search; auto power on and play; power-off eject; edit switch; headphone jack with volume control; picture-sharpness control; double-speed silent playback; wireless remote control. Audio dynamic range 90 dB in hi-fi mode. 16.9" W x 3.8" H x 14.7" D \$1,050
VR-HF710. Similar to the VR-HF720 but without on-screen programming \$950

GE

9-7400 Hi-Fi Videocassette Recorder
VHS-format front-loading table-top VCR with built-in MTS decoder, hi-fi sound, HQ circuitry, and 4 heads. Features dbx noise reduction; record level meters; noiseless special effects; headphone jack; sound level and L/R balance controls; 40-function remote control; on-screen programming from remote; 21-day, 8-event programming with one-hour memory backup and daily and weekly repeat; one-touch recording with standby; slanted control keyboard with illuminated graphics; see-through cassette door; top cassette window; swichable AC outlet; tape-remaining indicator; digital electronic tape counter; fine editing; up to 8 hours of recording



Akai VS-565U



HI-FI VCR'S

BUYING GUIDE

THERE are more hi-fi VCR's than ever this year, and a quick scan of the listings in this guide reveals that features once limited to the more expensive models—such as built-in MTS/SAP stereo-TV decoders and VHS HQ picture-enhancement circuitry—have now become standard equipment. The listings also reflect the state of the VCR format wars: There are now only two hi-fi models in the Beta format and two in 8mm.

The process of implementing new technologies and updating old ones continues apace. Toshiba, NEC, and JVC have introduced digital VCR's that use computer memory chips to reduce video noise, improve such existing special effects as freeze frame and slow motion, or create new special effects, such as off-the-air freeze frame and electronic paintbrush.

Toshiba's newest digital VCR, the DX-900 (to be available in fall 1987) uses built-in PCM (pulse-code-modulation) circuitry for recording video soundtracks with CD-quality sound. And Zenith's new full-size VHS camcorder has hi-fi sound, so you can record high-quality audio for your home movies and enjoy prerecorded VHS Hi-Fi movies using the same VCR.

The information in this guide was provided by the manufacturers and does not represent the results of tests by STEREO REVIEW. The suggested retail prices given were correct at press time. A directory of manufacturers is on page 82.

or playback; SP, LP, EP play and record speeds; video sharpness control. Includes VHF connecting cable; UHF twin lead wire; vertical lock tool; one pair audio cables. 17" W x 4" H x 14.2" D; 15.4 lbs \$1,000

9-7350 Hi-Fi Videocassette Recorder

VHS-format front-loading table-top VCR with MTS adaptor input, hi-fi sound, HQ circuitry, and 4 heads. Features dbx noise reduction; record level meters; noiseless special effects; headphone jack; sound level and L/R balance controls; 35-function remote control; programming from remote; 14-day/4-event programming with memory backup; voltage-synthesized tuning; 93-channel VHF, UHF, CATV connection capacity; one-touch recording with standby; slanted control keyboard with illuminated graphics; see-through cassette door; digital electronic tape counter with memory; fine editing; normal- and slow-speed tracking control; up to 8 hours of recording or playback; SP, LP, EP play and record speeds; video sharpness control. Includes VHF connecting cable; UHF twin-lead wire; 300- to 75-ohm transformer; vertical lock tool; one pair audio cables. 17" W x 4" H x 11.62" D; 13.9 lbs \$750

9-7320 Hi-Fi Videocassette Recorder

VHS-format front-loading table-top VCR with MTS adaptor input, hi-fi sound, and HQ circuitry. Features dbx noise reduction; record level meters; headphone jack; sound level and L/R balance controls; 35-function remote control; programming from remote; 14-day, 4-event programming with memory backup; voltage-synthesized tuning; 93-channel VHF, UHF, CATV connection capacity; one-touch recording with standby; slanted control keyboard with illuminated graphics; see-through cassette door; digital electronic tape counter with memory; fine editing; normal- and slow-speed tracking control; up to 8 hours of recording or playback; SP, LP, EP play and record speeds; video sharpness control. Includes VHF connecting cable, UHF twin-lead wire, 300- to 75-ohm transformer. 17" W x 4" H x 11.62" D; 13.6 lbs \$720



Canon VR-HF710

GOLDSTAR

GHV-8200M Hi-Fi Videocassette Recorder
VHS-format table-top VCR with hi-fi stereo sound and built-in MTS/SAP decoder. Features SP, LP, SLP play and record speeds; 14-day, 8-event timer; remote control; frame advance; remote pause; still frame; auto rewind; auto fine tuning; one-touch recording with standby; HQ circuitry; 110-channel cable-ready tuner with 80 presets; direct-access tuning; battery program backup; simulcast jack. Horizontal resolution 240 lines; video S/N 46 dB; audio FR 20-20,000 Hz ± 3 dB in hi-fi mode, 80-8,000 Hz ± 3 dB normal mode; power requirements 120 V, 28 W. 16.9" W x 3.9" H x 14" D; 18 lbs \$700

HARMAN KARDON

VCD4000 Hi-Fi Videocassette Recorder
VHS-format table-top VCR with hi-fi stereo

HI-FI VIDEOCASSETTE RECORDERS



Harman Kardon VCD4000

sound and HQ circuitry. Features MTS decoder; digital servo-controlled transport; SP, LP, EP play and record speeds; 21-day, 8-event timer; linear stereo; Dolby NR; remote control; frame advance; noiseless special effects; cable-ready tuner; still frame; auto fine tuning; audio dubbing; video dubbing; one-touch recording; time-remaining display; on-screen programming; variable slow motion; auto on; 2-speed search; detail control; hi-fi tracking control; slow-motion tracking control; program search; memory rewind; 30-s skip/search; headphone jack with volume control. Audio FR 20-20,000 Hz \pm 3 dB in hi-fi mode; 100-10,000 Hz \pm 3 dB in normal mode; audio distortion 0.2% in hi-fi mode; audio S/N 80 dB in hi-fi mode, 48 dB in normal mode. 17.36" W x 4.62" H x 15.62" D... \$1,195

VCD2000 Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound and HQ circuitry. Features MTS decoder; digital servo-controlled transport; SP, LP, EP play and record speeds; 21-day, 4-event timer; linear stereo; Dolby NR; remote control; cable-ready tuner; still frame; auto fine tuning; audio dubbing; video dubbing; one-touch recording. Audio FR 20-20,000 Hz \pm 3 dB in hi-fi mode; 100-10,000 Hz \pm 3 dB in normal mode; audio distortion 0.2% in hi-fi mode; audio S/N 80 dB in hi-fi mode, 48 dB in normal mode. 17.36" W x 4.62" H x 15.62" D... \$895



Hitachi VT-1720

HITACHI

VT-1800 Hi-Fi Videocassette Recorder

VHS-format VCR with hi-fi stereo sound and built-in MTS decoder. Features HQ circuitry; SP, LP, SLP play and record speeds; 365-day, 8-event timer; on-screen display; remote control; cable-ready tuner; noiseless special effects; freeze frame; frame advance; audio dubbing; one-touch recording; time-remaining display. 17.12" W x 3.88" H x 13.5" D; 16.5 lbs... \$999

VT-1720 Hi-Fi Videocassette Recorder

VHS-format VCR with hi-fi stereo sound and built-in MTS decoder. Features HQ circuitry; SP, LP, SLP play and record speeds; 14-day, 4-event timer; remote control with LCD for programming; cable-ready tuner; noiseless special effects; freeze frame; frame advance; audio dubbing; one-touch recording. 17.12" W x 3.88" H x 13.5" D; 16.5 lbs... \$799

INSTANT REPLAY

530IT3 Hi-Fi VCR

VHS-format table-model VCR with hi-fi stereo sound and the ability to translate international video transmission systems. (Based on a

Magnavox, Panasonic, or Quasar VCR.) Plays all PAL video tapes in color, including PAL B (Western Europe, India, Africa, Far East, Australia, Scandinavia), PAL N (Argentina, Peru, Paraguay), PAL I (UK, South Africa, Ireland), PAL M (Brazil). Plays SECAM B, G, V (Eastern Europe), SECAM D (Russia), SECAM H (Middle East), SECAM L (France) in monochrome. Compatible with most regular television sets or monitors. Features front-loading cassette mechanism; 14-day, 8-event timer; Dolby stereo; variable-speed slow motion; 139-channel cable-ready tuner; video peaking sharpness control; four heads; fast-scan forward and reverse; still frame; pushbutton electronic tuning; full track/audio track erase; 26-function remote control; one-touch recording; auto stop; built-in RF modulator for channels 3 and 4; multi-function display... \$1,795

618IT3. Similar to the 530IT3 but with HQ circuitry; MTS/SAP decoder; simulcast switch; 2 sets of audio outputs; auto index; audio and video editing; 27-function infrared dual-mode wireless remote control; automatic program finder; 107-channel direct-tuning cable-ready tuner; 30-day, 8-event on-screen programming with daily repeat, memory back-up... \$1,795

615IT3. Similar to 618IT3 but without MTS decoder... \$1,495

618IT4RGB Hi-Fi VCR

VHS-format table-model VCR with hi-fi stereo sound. Plays PAL or NTSC tapes on RGB monitor. Features built-in MTS/SAP decoder; on-screen programming; remote control; frame advance; noiseless special effects (SP, EP); cable-ready tuner; still frame; auto rewind; channel lock; auto fine tuning; audio dubbing; one-touch recording; time-remaining display; auto index; edit switch... \$1,895

JVC

HR-D756U Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound. Features HQ circuitry; MTS/SAP decoder; 14-day/8-event on-screen programming; 181-channel cable-ready tuner; 4-head, double-azimuth design; 2-speed recording and playback; variable slow-motion playback; selectable stereo audio dubbing; insert edit; picture-sharpness control; wireless remote control. Audio dynamic range >90 dB in hi-fi mode. 17.8" W x 3.75" H x 14.8" D... \$1,295

HR-S200U Convertible Hi-Fi VCR

VHS-format convertible table-top VCR with hi-fi stereo sound. The 5.5-lb recorder separates from the tuner for use with a video camera. Features MTS/SAP decoder; 14-day/8-event on-screen programming; 181-channel cable-ready tuner; 4-head, double-azimuth design; 2-speed recording and playback; audio dub; insert edit; wireless remote control. Audio dynamic range >80 dB in hi-fi mode. Power consumption (with camera) 18.5 watts. 8.1" W x 3.25" H x 9.1" D (recorder); 8.8" W x 3.1" H x 10.4" D (tuner)... \$1,195

HR-D570U Digital Hi-Fi VCR

VHS-format table-top VCR with hi-fi stereo sound and digital special effects. Features Digital Freeze, Digital Strobe, three-position Digital Solarization, digitally enhanced still frame and playback at one-eighth, one-fourth, and double normal speed; HQ circuitry; MTS/SAP decoder; 14-day/8-event programming; 181-channel cable-ready tuner with 10-key random-access channel selection; 4-head, double-azimuth design; luminance-signal comb filter; peak-hold

meters; manual audio-recording level controls with Automatic Level Control override; 9-selection, forward and reverse music scan; automatic playback; play memory; switchable AC outlet; FM simulcast; record mute; 60-minute memory backup; audio limiter; one-touch recording; tape-remaining indicator; picture-sharpness control; headphone jack with adjustable volume control; wireless remote control. Audio dynamic range >90 dB in hi-fi mode. 17.2" W x 3.75" H x 13.75" D... \$1,050



JVC HR-D570U

HR-D470U Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound. Features HQ circuitry; MTS/SAP decoder; 14-day/8-event programming; 181-channel cable-ready tuner; 4-head, double-azimuth design; 2-speed recording and playback; luminance-signal comb filter; 9-selection, forward and reverse music scan; automatic playback; picture-sharpness control; wireless remote control. Audio dynamic range >90 dB in hi-fi mode. 12.4" W x 3.5" H x 14.5" D... \$849

HR-D370U Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound. Features HQ circuitry; MTS/SAP decoder; 14-day/4-event programming with repeat; 111-channel cable-ready tuner; 2 video heads; 2-speed recording and playback; luminance-signal comb filter; nine-selection, forward and reverse music scan; picture-sharpness control; wireless remote control. Audio dynamic range >90 dB in hi-fi mode. 17.8" W x 3.75" H x 13.75" D... \$749



Kenwood KV-926HF

KENWOOD

KVR-926HF Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound. Features HQ circuitry; 14-day/4-event programming; 181-channel cable-ready tuner; 4-head, double-azimuth design; FM simulcast; Auto Incremental Recording (one-touch recording); assemble edit; wireless remote control. Available in fall 1987... \$830

MAGNAVOX

VR9565AT Hi-Fi Videocassette Recorder

VHS-format VCR with built-in MTS/SAP decoder. Features hi-fi stereo sound; 41-function wireless remote control with on-screen pro-

HI-FI VIDEOCASSETTE RECORDERS

gramming; 4-head system; 21-day, 8-event programming; 155-channel cable-ready tuner with random access; auto index search (uses silent cue for rapidly locating desired recording); 5-min backup timer; 3 record/playback speeds; one-touch recording; channel lock; audio dubbing/mix; auto fine tuning; transition editing; CATV adaptor jack; auto pause; auto rewind; tracking controls; tape-remaining indicator; forward/reverse search at 5X normal play speed (in SP mode) and 9X normal (in SLP mode). Audio FR 20-20,000 Hz; audio distortion <0.47%; audio S/N >60 dB. 17" W x 4" H x 11.5" D \$1,249

VR9558AT Hi-Fi Videocassette Recorder

VHS-format VCR with 4 video heads. Features on-screen programming; hi-fi stereo sound; 93-channel random access tuner; MTS/SAP jack (for optional external decoder); 14-day, 4-event programming; 5-min backup timer; one-touch record with standby. Special effects include forward/reverse search (5X normal playing speed in SP, 9X normal in SLP mode), still frame, frame advance, and slow motion. 37-function wireless remote includes 2X play and on-screen programming (help, OTR, OTR standby). Audio FR 20-20,000 Hz; audio distortion <0.47%; audio S/N >60 dB. 17" W x 4" H x 11.5" D \$949



Magnavox VR9565AT

VR9560AT Hi-Fi Videocassette Recorder

VHS-format table-model VCR with hi-fi stereo. Features HQ circuitry; MTS/SAP decoder; 21-day/8-event on-screen programming; 93-channel cable-ready tuner; 4 video heads; 3-speed recording and playback; one-touch recording with standby; automatic gain control; assemble edit; frame advance; slow motion; lighted cassette door; 60-minute battery backup; tape-remaining indicator; camera-remote-pause jack; headphone jack with adjustable volume control; auto rewind; power-off eject; picture-sharpness control; 39-function wireless remote control. Audio dynamic range >80 dB in hi-fi mode. 17" W x 4" H x 11.5" D \$849

VR9540AT Hi-Fi Videocassette Recorder

VHS-format VCR with hi-fi stereo sound and 2 heads. Features 93-channel random-access tuner; 14-day, 4-event programming; 5-min backup timer; 27-function wireless remote control; MTS/SAP jack; one-touch record with standby; auto fine tuning; channel lock; transition editing; auto rewind; auto still/pause release; camera-remote-pause jack; still frame; frame advance; slow motion; three play/record speeds; forward/reverse search. Audio FR 20-20,000 Hz; audio distortion <0.47%; audio S/N >60 dB. 17" W x 4" H x 11.5" D \$849

MARANTZ

VR560HQ Hi-Fi Videocassette Recorder

VHS-format table-top VCR with MTS/SAP decoder. Features 3 record/play speeds; slow motion; hi-fi sound; linear stereo; Dolby NR; remote control; frame advance; noiseless special effects; remote pause; 140-channel random-access cable-ready tuner; auto rewind; audio and video dubbing; one-touch recording; time-remaining display; 4 heads; sharpness control; VU

meters; serial recording; on-screen programming; 21-day, 8-event timer. Horizontal resolution 230 lines; video S/N 42 dB; audio FR 20-20,000 Hz \pm 3 dB in hi-fi mode, audio distortion 0.3% in hi-fi; audio S/N 80 dB in hi-fi mode. 17" W x 4.12" H x 14.36" D; 17.6 lbs \$1,000

VR465HQ Hi-Fi Videocassette Recorder

VHS-format table-top VCR with MTS/SAP decoder. Features 3 record/play speeds; slow motion; hi-fi sound; remote control; frame advance; noiseless special effects; remote pause; 110-channel cable-ready tuner; auto rewind; audio and video dubbing; one-touch recording; 4 heads; sharpness control; serial recording; 21-day, 4-event timer. Horizontal resolution 230 lines; video S/N 42 dB; audio FR 20-20,000 Hz \pm 3 dB in hi-fi mode, audio distortion 0.3% in hi-fi; audio S/N 80 dB in hi-fi mode. 17" W x 4.12" H x 14.36" D; 17.6 lbs \$800

VR460HQ Hi-Fi Videocassette Recorder

VHS-format table-top VCR with MTS/SAP decoder. Features 3 record/play speeds; hi-fi sound; remote control; remote pause; 110 channel cable-ready tuner; auto rewind; audio and video dubbing; one-touch recording; 2 heads; serial recording; 21-day, 4-event timer. Horizontal resolution 230 lines; video S/N 42 dB; audio FR 20-20,000 Hz \pm 3 dB in hi-fi mode, audio distortion 0.3% in hi-fi; audio S/N 80 dB in hi-fi. 17" W x 4.12" H x 14.36" D; 17.6 lbs \$700

MINOLTA

MV-60S Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound. Features HQ circuitry; MTS/SAP decoder; 14-day/4-event LCD-remote programming; 119-channel cable-ready tuner; 3 video heads; 3-speed recording and playback; frame advance; 5-min battery backup; one-touch recording; auto power on, rewind, and shutoff; 30-function wireless remote control \$860

MITSUBISHI

HS-421UR Hi-Fi Videocassette Recorder

VHS Hi-Fi stereo VCR with HQ circuitry. Features detail switch; FX-4 head design; programmable AC outlet; programmable from remote; scan; comb filter; edit switch; SP, LP, EP play/record speeds; 14-day, 8-event timer; frame advance; remote control; remote pause; cable ready; still frame; auto rewind; channel lock; automatic fine tuning; level control with LED meters; slow tracking; fine edit; auto rewind; sharpness control; counter memory; on-screen programming; headphone jack with level control; TV/VCR switching. Horizontal resolution 240 lines; audio FR 20-20,000 Hz \pm 3 dB in hi-fi mode; 50-10,000 Hz \pm 3 dB normal mode; audio distortion 0.3% in hi-fi mode, audio S/N 90 dB in hi-fi mode, 40 dB in normal mode; power consumption 36 W. 16.06" W x 3.44" H x 14.94" D; 20 lbs \$850

HS-411UR Hi-Fi Videocassette Recorder

VHS Hi-Fi stereo VCR with HQ circuitry. Features FX 4-head design; slow tracking; fine edit; TV/VCR switching; auto rewind; multi-OTR; picture control; counter memory; auto power on; SP, LP, EP play/record speeds; 14-day, 8-event timer; frame advance; noiseless special effects; remote control; remote pause; cable ready; auto rewind; channel lock; automatic fine tuning; scan and auto play; comb filter; auto power on; auto play; auto rewind. Horizontal resolution 240 lines; audio FR 20-20,000 Hz \pm 3 dB in

hi-fi mode, 50-10,000 Hz \pm 3 dB normal mode; audio distortion 0.3% in hi-fi mode; audio S/N 90 dB in hi-fi mode, 40 dB in normal mode; power consumption 36 W. 16.81" W x 37.44" H x 14.94" D; 20 lbs \$700



NEC DX-2000U

NEC

N-965V Hi-Fi Videocassette Recorder

VHS-format table-top VCR with 4 dual-azimuth video heads and built-in MTS/SAP decoder. Features 140-channel cable-ready tuner with digital display; hi-fi sound; remote control with on-screen display of timer/programming menu; remote pause; frame advance; noiseless special effects; still frame; auto rewind; channel lock; auto fine-tuning; one-touch recording; time-remaining display; HQ circuitry; linear stereo record/playback compatibility with Dolby noise reduction; 3 play/record speeds; 21-day, 8-event timer. Horizontal resolution more than 230 lines; video S/N >43 dB; audio FR 20-20,000 Hz \pm 3 dB in normal audio mode; audio distortion 0.005% in hi-fi mode; audio S/N 48 dB in normal mode (Dolby on). Power requirements 120 V AC \pm 10%, 60 Hz, 41 watts. 17" W x 4.12" H x 14.75" D; 19.2 lbs \$1,149

DX-2000U Digital Hi-Fi VCR

VHS-format table-top VCR with hi-fi stereo sound and digital picture processing. Features digital video noise reduction; digital still frame and slow motion; Digital Memory TV freeze frame; HQ circuitry; MTS/SAP decoder; 21-day/4-event on-screen programming; 110-channel cable-ready tuner with 40 channel presets; 2-head, slanted-azimuth design; 3-speed recording and playback; one-touch recording; 3-speed, forward and reverse picture search; auto power on; power-off eject; 10-min battery backup; lighted cassette well; picture-sharpness control; wireless remote control (also operates selected NEC TV sets). Audio dynamic range >90 dB in hi-fi mode. 17" W x 4.15" H x 14.75" D \$850



Panasonic PV1462

PANASONIC

PV1742 Hi-Fi Videocassette Recorder

VHS-format table-top videocassette recorder with hi-fi sound and built-in MTS/SAP decoder. Features 4 heads; 155-channel frequency-synthesized tuner; SP, LP, SLP play speeds; SP, LP, SLP record speeds; 21-day, 8-event timer; remote control; frame advance; noiseless special effects; cable ready; still frame; auto rewind; audio dubbing; one-touch recording with standby;

HI-FI VIDEOCASSETTE RECORDERS

time-remaining display; HQ circuitry; auto in/out eject; on-screen help, remote programming; multi-function on-screen display of mode, date, time, and channel; video search. Power requirements 120 V AC, 60 Hz, 32 W. 17" W x 4" H x 14" D; 16 lbs \$1,250

PV1642 Hi-Fi Videocassette Recorder

VHS-format table-top videocassette recorder with hi-fi sound and built-in MTS/SAP decoder. Features 4 heads; cable-ready frequency-synthesized tuner; SP, LP, SLP play speeds; SP, LP, SLP record speeds; 21-day, 8-event timer; remote control; frame advance; still frame; noiseless special effects; auto rewind; one-touch recording with standby; HQ circuitry; auto in/out eject; on-screen help, remote programming; multi-function on-screen display of mode, date, time, and channel. Power requirements 120 V AC, 60 Hz, 32 W. 17" W x 4" H x 14" D; 15.6 lbs \$1,000



Pioneer VH-900

PV1564 Hi-Fi Videocassette Recorder

VHS-format table-top videocassette recorder with hi-fi sound and input for optional MTS decoder. Features 4 heads; cable-ready voltage-synthesized tuner; SP, LP, SLP play speeds; SP, LP, SLP record speeds; 14-day, 4-event timer; remote control; frame advance; noiseless special effects; still frame; auto rewind; one-touch recording with standby; HQ circuitry; auto in/out eject; on-screen help, remote programming; multi-function on-screen display of mode, date, time, and channel. Power requirements 120 V AC. 17" W x 4" H x 11.5" D \$850

PV1462 Hi-Fi Videocassette Recorder

VHS-format table-top videocassette recorder with hi-fi sound and input for optional MTS decoder. Features cable-ready voltage-synthesized tuner; SP, LP, SLP play speeds; SP, LP, SLP record speeds; 14-day/4-event timer; remote control; frame advance; still frame; auto rewind; one-touch recording with standby; HQ circuitry; omniseach still/slow/2X play (SLP mode); auto in/out eject; on-screen help, remote programming; multi-function on-screen display of mode, date, time, and channel. Power requirements 120 V AC, 60 Hz, 29 W. 17" W x 4" H x 11.5" D; 13.2 lbs \$750

PENTAX

PV-T150A Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound. Features HQ circuitry; MTS/SAP decoder; 14-day/4-event LCD-remote programming; 119-channel cable-ready tuner; 3 video heads; 3-speed recording and playback; manual audio-recording level controls; FM simulcast; visual search; frame advance; repeat; slow motion; Instant Recording Timer; one-touch recording; auto power on, rewind, and shutoff; AC outlet; 35-function wireless remote control. 17.1" W x 3.75" H x 13.5" D \$890

PHILCO

V1670WSL Hi-Fi Videocassette Recorder

VHS Hi-Fi videocassette recorder. Features SP/LP/SLP play, record, and rapid-search speeds; SP/SLP slow-motion speeds; 14-day/4-event timer; frame advance; noiseless special effects; remote control; remote pause; cable-ready; still frame; automatic rewind; channel lock; automatic fine tuning; audio dubbing; VS tuner; 2 heads. Horizontal resolution 230 lines; video signal-to-noise >40 dB; audio frequency response 20-20,000 Hz \pm 3 dB in hi-fi mode; audio distortion <0.47% in hi-fi mode; audio signal-to-noise >60 dB in hi-fi mode; power consumption 29 watts. 17" W x 4" H x 11.5" D; 14.5 lbs \$700

PIONEER

VH-900 Hi-Fi Videocassette Recorder

VHS-format table-model VCR with hi-fi stereo sound. Features HQ circuitry; MTS/SAP decoder; 14-day/4-event LCD-remote programming; 119-channel cable-ready tuner; 5 video heads; 3-speed recording and playback; one-touch recording; line-type comb filter; program scan; auto video-gain control; 35-function wireless remote control. Audio dynamic range >80 dB in hi-fi mode \$999

QUASAR

VH5865 Hi-Fi Videocassette Recorder

Front-loading VHS-format videocassette recorder with built-in MTS stereo decoder. Features hi-fi stereo sound; HQ; 4 heads; noise-free still frame; frame advance; variable slow motion; fast-motion playback; high-speed picture search; 21-day, 8-event program timer; programmable one-touch recording; frequency-synthesis tuner; 42-function wireless remote control; auto power/eject; multi-function on-screen display; tape-remaining indicator; auto index search; timer back-up system; auto stop and rewind; picture sharpness control; direct-drive cylinder motor; direct-drive capstan motor; diecast aluminum chassis. 16.94" W x 4" H x 14.19" D; 16.1 lbs \$1,070

VH5665 Hi-Fi Videocassette Recorder

Front-loading VHS-format videocassette recorder with built-in MTS stereo decoder. Features hi-fi stereo sound; HQ; 4-head video system; noise-free still frame; frame advance; variable slow motion; fast-motion playback; high-speed picture search; 21-day, 8-event program timer; programmable one-touch recording; frequency-synthesis tuner; 40-function wireless remote control; auto power/eject; multi-function on-screen display; timer back-up system; auto stop and rewind; picture-sharpness control; direct-drive cylinder motor; direct-drive capstan motor; diecast aluminum chassis. 16.94" W x 4" H x 14.19" D; 15.7 lbs \$670

RCA

VMT670HF Hi-Fi Videocassette Recorder

VHS Hi-Fi VCR with built-in MTS/SAP decoder. Features HQ circuitry; 169-channel cable-ready frequency-synthesis tuner; simulcast capa-

Pentax PV-T150A



bility; auto-programming tuner; SP, LP, SLP play/record speeds; high-speed search; freeze frame; frame advance; variable slow motion (SP, SLP); 1-year, 8-event program timer; delayed-start express recording; wireless remote control; remote programming with on-screen display; digital command center compatibility; 5 video, 2 audio heads; headphone jack; auto re-



Realistic Model 42

wind. Hi-fi audio FR 20-20,000 Hz; dynamic range >80 dB; THD 0.4%; W&F <0.005%; ch sep >60 dB. 3.88" H x 17.12" W x 13.5" D; 19.1 lbs \$899

VMT630HF Hi-Fi Videocassette Recorder

VHS Hi-Fi VCR with built-in MTS/SAP decoder. Features HQ circuitry; 119-channel cable-ready frequency-synthesis tuner; simulcast capability; auto-programming tuner; SP, LP, SLP play/record speeds; high-speed search; freeze frame; frame advance; fixed slow motion (SLP); 1-year, 4-event program timer; delayed-start express recording; infrared wireless remote control; remote programming with on-screen display; digital command center compatibility; 3 video, 2 audio heads; headphone jack; auto rewind. Hi-fi audio FR 20-20,000 Hz; dynamic range >80 dB; THD 0.4%; W&F <0.005%; ch sep >60 dB. 3.88" H x 17.12" W x 13.88" D; 16.1 lbs \$699



Sansui SV-R9500HF

REALISTIC

Model 42 Hi-Fi Videocassette Recorder

VHS-format table-model VCR with hi-fi stereo sound. Features HQ circuitry; MTS/SAP decoder; 14-day/4-event programming; 110-channel cable-ready tuner with 32 presets; 2 video heads; 3-speed recording and playback; 4-digit electronic tape counter; 2-speed visual search; one-touch recording; auto power on, play, rewind, and eject; wireless remote control. 16.9" W x 3.7" H x 13.5" D \$600

SAMSUNG

VR-6600F Hi-Fi Videocassette Recorder

VHS-format table-model VCR with hi-fi stereo sound. Features HQ circuitry; MTS/SAP decoder; 14-day/6-event programming; 110-channel cable-ready tuner; 2 video heads; picture search; electronic tape counter with counter memory; one-touch recording; auto play and rewind; 23-function wireless remote control. 16.5" W x 3.7" H x 13.5" D \$650

VT-226T Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound, slow motion, frame advance, and elec-

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HI-FI VIDEOCASSETTE RECORDERS

tronic counter. Features 3 play speeds; 3 record speeds; 14-day, 6-event timer; remote control; remote pause; cable ready; auto rewind; channel lock; 4 heads. Horizontal resolution >210 lines; audio S/N 40 dB in hi-fi mode. 17" W x 4" H x 15" D; 18.7 lbs \$440

SANSUI

SV-R9500HF Hi-Fi Videocassette Recorder
VHS-format table-top VCR with HQ circuitry. Features SP, EP record speeds; still frame; one-touch recording; backspace edit; counter memory; hi-fi sound; linear stereo; auto rewind; auto fine tuning; audio and video dubbing; auto power on; remote pause; cable-ready tuner; auto fine tuning. 17" W x 4" H x 13" D \$900

SANYO

VHR1900 Hi-Fi Videocassette Recorder
VHS-format table-top VCR with hi-fi stereo sound. Features built-in MTS/SAP decoder; HQ circuitry; wireless remote control; SP, LP, EP play and record speeds; 4 heads; noise-free special effects; variable slow motion; high-speed search; freeze frame with frame advance; 107-channel cable-ready tuner; direct-access tuning; 8-event, 14-day timer; one-touch recording; picture detail and sharpness adjustment; auto re-



Scott SVR-504S

wind, memory rewind; auto playback; auto power on; power failure backup. Horizontal resolution 240 lines; video S/N 45 dB; audio FR 20-20,000 Hz \pm 3 dB in hi-fi mode. 16.5" W x 3.88" H x 14.75" D; 19 lbs \$750

VHR2900 Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound. Features built-in MTS/SAP decoder; detail-enhancement circuit; sharpness control; wireless remote; 365-day/8-event timer; on-screen display of timer program, channel, tape counter, time and date, tape transport mode and tracking; one-touch recording; linear stereo with Dolby NR playback only; SP, LP, EP play and record speeds; 111-channel cable-ready tuner; auto rewind, memory rewind; auto playback; auto power on. Horizontal resolution 240 lines; video S/N 45 dB; audio FR 20-20,000 Hz \pm 3dB hi-fi mode. 16.5" W x 3.88" H x 14.75" D; 19 lbs \$650

SCOTT

SVR-504S Hi-Fi Videocassette Recorder
VHS-format table-top VCR with built-in MTS/SAP stereo decoder. Features HQ circuitry; hi-fi sound; remote control; 3 play speeds. 2 record speeds; 14-day, 8-event timer; noiseless special effects; remote pause; still frame; auto fine-tuning; audio dubbing; one-touch recording; 4 video heads; 16-channel presets; LED record-level indicators; headphone jack; 139-channel cable-ready tuner; simulcast switch. Horizontal resolution 240 lines. 17" W x 4.36"



Sharp VC-H65U

H x 13" D; 21 lbs \$850
SVR-330S. Similar to the SVR-504S but with 14-day/4-event programming and 2 video heads \$580

SHARP

VC-H65U Hi-Fi Videocassette Recorder
VHS-format table-top front-loading videocassette recorder with built-in MTS decoder. Features HQ circuitry with double comb filter; 14-day, 6-event daily/weekly repeat programmable timer; 110-channel cable-ready PLL-synthesized tuner; 23-function wireless remote control; auto power on/playback/repeat function; one-touch recording; 15X search; automatic program search system (APSS); still function in EP mode; fluorescent dual-time display; electronic 4-digit tape counter; 8-hour recording and playback; microcomputer-controlled power-assist drive; tuner/simulcast/AUX input selector; auto TV/VCR output selector; headphone jack with adjustable level; dew sensor and warning indicator; built-in RF converter; program memory backup system \$820

VC-H64U Hi-Fi Videocassette Recorder

VHS-format table-top front-loading videocassette recorder with hi-fi sound. Features HQ circuitry with double comb filter; input for optional MTS decoder; 14-day/4-event daily/weekly repeat programmable timer; 110-channel cable-ready voltage-synthesized tuner with 16 memory presets; 13-function wireless remote control; auto power on/playback/repeat function; one-touch recording; 15X search; still function in EP mode; fluorescent time display; electronic 4-digit tape counter; 8-hour recording and playback; microcomputer-controlled power-assist drive; tuner/simulcast/auxiliary input selector; auto TV/VCR output selector; headphone jack with adjustable level; dew sensor and warning indicator; built-in RF converter; program memory backup system \$700

SYLVANIA

VC8970 Hi-Fi Videocassette Recorder
VHS-format table-top VCR with MTS/SAP decoder. Features hi-fi stereo sound; 4-head system; 93-channel random-access tuner; 39-function wireless remote control; 21-day, 8-event programming; 60-minute backup timer; forward/reverse high-speed search; still frame; frame advance; slow motion; one-touch record with standby; on-screen programming; auto fine-tuning; vertical lock; channel lock; transition editing; CATV adaptor jack. FR 20-20,000 Hz; THD <0.47%; S/N >60 dB. 17" W x 4" H x 11.5" D; \$1,049

TEAC

MV-800 Hi-Fi Videocassette Recorder
VHS-format table-top videocassette recorder with hi-fi sound. Features SP, EP play/record

speeds; counter-search mechanism; selectable audio monitoring (hi-fi stereo or longitudinal audio track or both mixed); fluorescent display; shuttle search at 7X normal speed in either direction; double-flap motorized front cassette loading system; auto-power; automatic dubbing on longitudinal audio track; multi-LED level indicators for L+R channels for hi-fi stereo recording; 14-day/8-event programmable timer with 60-minute memory backup time; full-function infrared remote control; headphone and microphone jacks; four heads; 178-channel cable-ready frequency-synthesis tuner; 10-key direct-access channel selection; automatic rewind. Audio FR 20-20,000 Hz in hi-fi mode, 70-10,000 Hz in normal mode; audio S/N greater than 40 dB in normal mode; dynamic range greater than 80 dB in hi-fi mode; wow-and-flutter less than 0.005% in hi-fi mode. 17.1" W x 3.7" H x 14.9" D; 19.1 lbs \$1,400

MV-900 Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound. Features digital-memory function and effects (E-E still frame, Interval Play, and Solarization); DA-4 heads; SP, EP, LP play speeds; SP, EP record speeds; remote control with frame advance; cable ready; still frame. Power requirements 120 V AC, 38 W. 17.19" W x 3.75" H x 13.25" D; 22.2 lbs \$999

MV-600 Hi-Fi Videocassette Recorder

VHS-format table-top VCR with 108-channel quartz-locking digital tuner. Features hi-fi stereo sound; MTS decoder; simulcast record capable; selectable audio monitoring; HQ circuitry; video NR; sharpness control; music scan; back space assemble edit; remote control; one-touch recording. Audio FR 20-20,000 Hz \pm 3 dB in hi-fi mode, 100-10,000 Hz \pm 3 dB in normal mode. \$699

TOSHIBA

DX-7 Digital Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound and digital special effects. Features digitally enhanced still-frame, slow-motion, and double-speed playback; HQ circuitry; MTS/SAP decoder; 7-day/4-event programming; 117-channel cable-ready tuner; 4-head, double-azimuth design; auto visual indexing; 2-speed picture search; auto power on; picture-sharpness control; 19-function wireless remote control \$1,296

DX-900 PCM Digital Hi-Fi VCR

VHS-format table-top VCR with pulse-code-modulation stereo sound, hi-fi stereo sound, and digital special effects. Features Multi-Quadrant Freeze of 4 pictures from 1 video source or 1 picture from each of 4 video sources; Multi-Quadrant Frame Advance; digital slow motion, reverse slow motion, freeze frame, and off-air freeze frame; HQ circuitry; MTS/SAP decoder; 14-day/4-event fiber-optic on-screen programming with light pen; 139-channel cable-ready tuner; wireless remote control. Available in fall 1987. Price to be announced.

M-5900 Hi-Fi Videocassette Recorder

VHS Hi-Fi table-top videocassette recorder with built-in MTS decoder. Features SP, EP play, record, slow-motion and rapid-search speeds; 7-day/4-event timer; 4 heads (double azimuth); 117-channel capability; frame advance; 20-function remote control; noiseless special effects; remote pause; Dolby noise reduction; cable ready; video dubbing; still frame; automatic rewind; automatic fine tuning; audio dubbing; program indexing \$749

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HI-FI VIDEOCASSETTE RECORDERS

M-2700 Hi-Fi Videocassette Recorder

VHS-format table-model VCR with hi-fi stereo sound. Features HQ circuitry; MTS/SAP decoder; 7-day/4-event programming; 105-channel cable-ready tuner; 2 video heads; auto power on; 15-function wireless remote control. 16.9" W x 3.75" H x 14.75" D \$730

VECTOR RESEARCH

V-5040 Hi-Fi Videocassette Recorder

VHS-format table-top remote-controlled VCR with hi-fi stereo sound; MTS/SAP decoder; 28-day, 3-event timer. Features SP, LP, SLP play and record speeds; linear stereo; Dolby NR; frame advance; noiseless special effects; remote pause; still frame; auto rewind; channel lock; auto fine tuning; one-touch recording; time-remaining display; 4 double-azimuth heads; HQ; 21X picture search; 140-channel cable-ready tuner with direct access; on-screen programming; audio level controls with level meter. Horizontal resolution 230 lines; video S/N 47 dB; audio FR 20-20,000 Hz ± 3 dB in hi-fi mode; audio distortion 0.5% in hi-fi mode; audio S/N 90 dB in hi-fi mode; power requirements 120 V AC, 60 Hz, 41 W. 17" W x 4" H x 15" D; 18 lbs. \$1,099



Vector Research V-5040

V-4040 Hi-Fi Videocassette Recorder

VHS-format table-top videocassette recorder with hi-fi stereo sound. Features 4 heads (double azimuth); SP, LP, SLP play and record speeds; remote control; frame advance; noiseless special effects; remote pause; still frame; auto rewind; channel lock; auto fine tuning; 21-day, 4-event timer; cable ready. Horizontal resolution 230 lines; video S/N 47 dB; audio FR 20-20,000 Hz ± 3 dB in hi-fi mode; audio distortion 0.5% in hi-fi mode; audio S/N 90 dB in hi-fi mode; power requirements 120 V AC, 60 Hz, 35 W. 17" W x 4" H x 15" D \$849
V-4020. 2-head version of V-4040 without noiseless special effects \$749

YAMAHA

YV-700 Hi-Fi Videocassette Recorder

VHS-format table-top VCR with hi-fi stereo sound. Features HQ circuitry; MTS/SAP decoder; 4 video heads; 14-day/4-event programming; 111-channel cable-ready tuner; 2-speed recording and playback; manual audio recording-level controls; instant recording; auto-back-space recording; record mute; high-speed tape search;



Yamaha YV-700



Zenith VR3300

selectable switched/unswitched AC outlet; FM simulcast; headphone jack with adjustable volume control; picture-sharpness control; wireless remote control. Audio dynamic range >90 dB in hi-fi mode. 17.25" W x 3.75" H x 13.25" D \$749

ZENITH

VR4100 Hi-Fi Videocassette Recorder

VHS-format hi-fi stereo VCR with built-in MTS/SAP decoder. Features linear stereo sound with Dolby NR; wireless 18-function TV/VCR remote control; remote programming with on-screen display; 14-day, 8-event timer with simplified direct-input programming; HQ circuitry with video noise reduction; 4 video, 2 audio heads; 178-channel quartz tuning with direct access and up/down scan; noiseless forward and reverse, variable-speed slow and fast action and frame-by-frame special effects; SP, SLP record; SP, LP, SLP playback speeds; 1-hr power backup; synchronized "Clean Edit" video insert; auto rewind; time-remaining and program-location indicators; prerecorded VCR operating guide. 17.25" W x 3.88" H x 14.88" D; 19.7 lbs. \$1,100

VR4100Y. Similar to the VR4100 except finished in black \$1,100

VR5100 Convertible Hi-Fi VCR

VHS-format convertible table-top VCR with hi-fi stereo sound. The 5.6-pound recorder separates from the tuner for use with a video camera. Features MTS/SAP decoder; 14-day/8-event programming; 178-channel cable-ready tuner; 2-head, slant-azimuth design; 2-speed recording and playback; forward and reverse picture search; 3-way power capability; auto battery charger; low-battery indicator; direct video-camera input; audio dub; insert edit; tape memory counter; 60-min battery backup; 14-function wireless remote control (also operates Zenith remote-control TV sets). Audio dynamic range >80 dB in hi-fi mode. 8.2" W x 3.2" H x 9.1" D (recorder); 8.75" W x 3.1" H x 10.8" D (tuner) \$1,000

VR3300 Hi-Fi Videocassette Recorder

VHS-format hi-fi stereo VCR with built-in MTS/SAP decoder. Midi-design cabinet loads cassettes end first. Features 29-function wireless remote control with 10 TV and 19 VCR functions; remote programming with on-screen display; 14-day, 8-event timer with simplified direct-input programming; HQ circuitry with video noise reduction and comb filter; 4 video, 2 audio heads; 178-channel quartz tuning with direct access and up/down scan; noiseless pause/still frame and slow motion; SP, SLP record; SP, LP, SLP playback speeds; 1-hr power backup; audio dubbing capability; auto power on; auto play; play memory; auto rewind; music scan; go to locates and plays pre-selected tape segments; instant record button; auto hi-

fi/linear switching during playback; time-remaining indicator; prerecorded VCR operating guide. Black finish. 13.44" W x 4.19" H x 14.81" D; 17 lbs. \$999

VR2300. Similar to the VR3300 except 4-event timer, brown finish \$899

VR3220 Hi-Fi Videocassette Recorder

VHS-format hi-fi stereo VCR with built-in MTS/SAP decoder. Features 24-function wireless TV/VCR remote control; remote programming with on-screen display; 14-day, 8-event timer with simplified direct-input programming; HQ circuitry with comb filter; 4 video, 2 audio heads; 178-channel quartz tuning with direct access and up/down scan; noiseless pause/still-frame and slow-motion picture; SP, SLP record; SP, LP, SLP playback speeds; 1-hr power backup; audio dubbing capability; volume control; auto power on; auto rewind; time-remaining indicator; one-button instant record; prerecorded operating guide. 17.19" W x 3.75" H x 14.88" D; 17.9 lbs. \$849

VR2220 Hi-Fi Videocassette Recorder

VHS-format hi-fi stereo VCR with built-in MTS/SAP decoder. Features 17-function wireless TV/VCR remote control; remote programming with on-screen display; 14-day, 4-event timer with simplified direct-input programming; HQ circuitry with comb filter; 2 video, 2 audio heads; 108-channel quartz tuning with direct access and up/down scan; pause/still frame; SP, SLP record; SP, LP, SLP playback speeds; 1-hr power back up; audio dubbing capability; volume control; auto power on; auto rewind; time-remaining indicator; one-button instant record; prerecorded VCR operating guide. 17.19" W x 3.75" H x 14.88" D; 17.9 lbs. \$699

BETA TABLE-TOP VCR'S



Sony SL-HF450

SONY

SL-HF1000 SuperBeta Hi-Fi VCR

Beta-format table-model VCR with hi-fi stereo sound, SuperBeta picture-enhancement circuitry, and advanced editing. Features MTS/SAP decoder; 21-day/8-event on-screen programming; 181-channel cable-ready tuner; 4-head, double-azimuth design; Beta Is record speed; dual flying erase heads; 1-segment audio/video insert edit; audio dub; frame recording; pre-roll editing with linear time and frame counter; 8-segment programmable assemble edit; built-in character generator with 8-page titling memory; variable-speed search by jog/shuttle dial (also on remote); 12-segment LED peak-level meter; manual audio recording-level controls; FM simulcast; Linear Time Counter; Quick Timer; electronic tab marker; index scan and index search; 10-min battery backup; headphone jack with adjustable volume control; SuperBeta override; auto power on, play, stop, and rewind; power-off eject; wireless remote control (also operates Sony Trinitron TV sets). PCM adapt-

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SMM TABLE-TOP VCR'S



Sony EV-S700U

KODAK

MVS-5380 PCM Digital 8mm VCR

8mm-format table-top videocassette recorder with PCM digital stereo sound. Features SP, LP play speeds; SP, LP record speeds, rapid-search speeds; hi-fi sound; stereo; frame advance; noiseless special effects; remote control; remote pause; cable ready; video dubbing; still frame;

automatic rewind; channel lock; automatic fine tuning; audio dubbing; 21-day/8-event on-screen programming; 169-channel; records up to 6 tracks of audio. Battery optional; battery charge lasts for 45 minutes to one hour. 6.5" W x 2.6" H x 5.3" D \$1,600

SONY

EV-S700U PCM Digital 8mm VCR

8mm-format table-top VCR with PCM digital stereo sound. Can record up to 24 hours of PCM digital audio on a single P6-120 8mm tape (music only). Features MTS/SAP decoder; 21-day/6-event programming; 181-channel cable-ready tuner; 2-speed recording and playback for up to 4 hours of programming on a single tape; 16-segment LED peak level meters; FM simulcast; flying erase head; digital audio dub; frame-by-frame advance; slow motion; Quick Timer; auto play, rewind, and stop; wireless remote control. Audio dynamic range 70 dB (mono AFM), >88 dB (stereo PCM). 14" W x 3.25" H x 13.25" D \$1,395

PORTABLE VCR'S

HITACHI

VT-98A Portable Hi-Fi VCR

Front-loading portable VHS-format videocassette recorder with 5 + 2 heads. Features 8-program, 1-year timer; noise-free fine editing; MTS/SAP decoder; on-screen programming; dual-function VCR/TV wireless remote control; video dubbing; automatic audio level control; automatic rewind and shut-off; Video S/N 45 dB in SP mode; horizontal resolution 240 lines; audio FR 20-20,000 Hz. 17.12" W x 4.5" H x 10.12" D; 7 lbs \$1450



Kodak MVS-5380

PANASONIC

PV-9600A Portable Hi-Fi VCR

Portable VHS-format videocassette recorder with hi-fi sound. Features 139-channel cable-ready tuner; 14-day, 8-event timer; 4 video heads; 2 audio heads; SP, LP, SLP play speeds; SP, LP, SLP record speeds; SP and SLP variable slow-motion speeds; SP, SLP rapid-search speeds. Includes top-loading design; noiseless special effects; wireless remote control; remote pause; still frame; frame advance; automatic fine tuning; automatic search \$1,450

ZENITH

VM7100 Hi-Fi Camcorder

VHS-format camcorder with hi-fi stereo sound. Can be connected to any TV set to play back homemade or prerecorded movies. Features HQ circuitry; 4 video heads; autofocus; auto white balance; auto iris; electronic viewfinder; 6:1 power-zoom lens; 8-lux low-light rating; 8-hour recording; built-in stereo microphone; audio dub; fade; zoom; pause; speed search; slow motion; 5.3 lbs \$1,795

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BEST RECORDINGS OF THE MONTH

Stereo Review's critics choose the outstanding current releases

THE MAGIC OF RONSTADT AND RIDDLE

BACK in the Fifties, something happened to popular music: a generation of vocalists went from hot to warm. When singers like Frank Sinatra, Peggy Lee, and Ella Fitzgerald did swing, they did it with sophistication. It was an era of great arrangers working with the tools of both the jazz band and the string orchestra—arrangers like Gordon Jenkins and Billy May. But the warmest, most sophisticated romantic of all was Nelson Riddle. Riddle's arrangements for Sinatra, Judy Garland, Nat "King" Cole, and Fitzgerald were breathtakingly sensuous, yet they were models of taste, elegance, and subtlety. His string arrangements are still legendary, and his classic albums with Sinatra ("Only the Lonely," "For Swinging Lovers") and other great vocalists of the time are archetypes of American music as important as jazz or the Broadway musical. Like all good things, this golden era eventually ended. Romance turned to mush as the Bert Kaempfer and Ray Conniff made "orchestra" synonymous with "mood music." Suddenly, warm wasn't cool.

That's why we owe a debt to Linda Ronstadt. "For Sentimental Reasons" is the last—and, I think, the best—of three albums Ronstadt recorded with the late Nelson Riddle. In 1983 she lured Riddle out of semi-retirement to record "What's New," which was in part a tribute to his classic Sinatra arrangements but also a standard-setting session in its own right. They liked working together so much that they recorded a second album, "Lush Life," which picked up the tempo; if anything, they got better. Their third recording was Nelson Riddle's last.

In its range of moods and tempos,

"For Sentimental Reasons" is the best balanced of the three records. More than that, though, Ronstadt and Riddle seem to find the true emotional center of these songs—exactly the right sound, right pace, right inflection. Not that "What's New" and "Lush Life" were ever very far from the heart, but in the last set Riddle's fabled strings and woodwinds achieve even greater delicacy and depth of feeling, if that's possible. And Ronstadt's satiny soprano gives every note its emotional due: hope and innocence in *When You Wish Upon a Star* (a song that always seemed silly to me

whole new set of definitive performances, and for reawakening our ears to a rich era in American popular music. *Mark Peel*

LINDA RONSTADT: *For Sentimental Reasons.* Linda Ronstadt (vocals); Nelson Riddle and His Orchestra; other musicians. *When You Wish Upon a Star; Bewitched, Bothered and Bewildered; You Go to My Head; But Not for Me; My Funny Valentine; I Get Along Without You Very Well; Am I Blue; I Love You for Sentimental Reasons; Straighten Up and Fly Right; Little Girl Blue; 'Round Midnight.* ASYLUM 60474-1 \$8.98, © 60474-4 \$8.98, © 60474-2 \$15.98.



Nelson Riddle and Linda Ronstadt: finding the emotional center

until I heard this version—now I believe it), dreamy vexation in *Bewitched, Bothered and Bewildered*, a brave front in *I Get Along Without You Very Well*, playfulness in *Straighten Up and Fly Right*. And then there's *'Round Midnight*, the most powerful song in the album: how Riddle got so much sadness into those strings without seeming maudlin or melodramatic was part of his magic.

What could have been merely a fling with swing turned into a commitment for Ronstadt—perhaps a risky one, coming at a time when she was the reigning queen of rock. So if this review comes off sounding like a thank-you note, it is: thank you, Linda Ronstadt, for getting a pop-music giant to lay down some of his best work when there wasn't much demand for it, for giving us a

MACKERRAS'S BLAZING JANÁČEK MASS

LEOŠ JANÁČEK'S extraordinary setting of the Glagolitic Mass has until now been best served by Rafael Kubelik's impassioned Deutsche Grammophon recording with the Bavarian Radio Symphony Orchestra and Chorus (available on LP only). But that reading has finally been matched, and then some, by a new digital recording done in Prague for Supraphon under the baton of Sir Charles Mackerras.

Using an edition based on the latest research into the autograph materials, Mackerras and his top-

BEST RECORDINGS OF THE MONTH



SUZETTE GIBBS/LONDON RECORDS

Elisabeth Söderström: soaring

notch forces—the Prague Philharmonic Chorus and the Czech Philharmonic Orchestra, together with a fine team of soloists—give us a realization that blazes with commitment. Indeed, the fervor of the ecstatic choral outbursts and solo interjections, such as those for the tenor toward the end of the *Gloria*, are startlingly reminiscent of a black gospel service at full tilt!

The purely instrumental writing is equally extraordinary, whether in the intense orchestral interlude that precedes the section of the *Credo* describing the Passion, the celestial introduction to the *Sanctus*, or the very last portion of the work, a turbulent and virtuosic organ solo followed by a festive fanfare for full orchestra. The timpani and trumpets at the top of the register create at this point an almost neo-pagan atmosphere.

On CD, the recording's sound can only be described as ideal—wonderfully spacious without a trace of muzziness, with fine localization of the major sections of the chorus and flawlessly defined lower-register transients, particularly in the timpani passages.

Of the four solo singers, it is the redoubtable Elisabeth Söderström who stands out most, with her soaring opening to the *Gloria*. Tenor František Livora runs her a close

second in his trumpet-like proclamations in the *Gloria* and *Credo*.

At forty minutes of running time, the CD offers somewhat short measure. Also, I wish that the notes were more detailed, and that English texts had been provided in addition to the Slavonic, Latin, and Japanese. But I would not let such considerations keep me from prompt purchase of this disc. Its musical satisfactions will surely be lasting ones.

David Hall

JANÁČEK: *Glagolitic Mass*. Elisabeth Söderström (soprano); Drahomíra Drobná (mezzo-soprano); František Livora (tenor); Richard Novák (bass); Jan Hora (organ); Prague Philharmonic Chorus; Czech Philharmonic Orchestra, Charles Mackerras cond. SUPRAPHON/DENON © 33C37-7448 no list price.

LOS LOBOS: HONESTY AND MATURITY

As last glimpsed, in 1985's "How Will the Wolf Survive," Los Lobos seemed the unlikely of candidates for pop stardom. A bunch of paunchy, goateed, unsuitable-for-MTV types, they made music that combined in equal measure the Chicano and Tex-Mex rock of Richie Valens and Freddy Fender, authentic Latino folk, the anthemic pop-rock of *Who'll Stop the Rain* Creedence, and the deepest kind of Chica-

Los Lobos's Cesar Rosas: unruffled



go Blues. In their wonderful new album, "By the Light of the Moon," Los Lobos continue to do all that (though they go a little lighter on the folk stuff), but they're also onto something more serious. Where once they sounded like merely the smartest bar band of all time, Los Lobos now sound suspiciously like Studs Terkel with a good beat.

In fact, the best songs in the album—*One Time One Night*, *The Hardest Time*, *Is This All There Is?*—are in a real sense poetic reportage, aural snapshots of moments in the lives of recognizably real people whose options have been foreclosed yet who can still view the American Dream as more of a black comedy than a tragedy. There are, of course, less weighty concerns addressed here too. *Shakin' Shakin' Shakes*, for example, is content with being one of the sexiest, rock-the-house-down blues workouts ever committed to vinyl—it features a shuddering guitar duel between the band's principals, David Hidalgo and Cesar Rosas. And *Set Me Free (Rosa Lee)*, in which old Motown grooves are enlivened with a sort of barrio romanticism, is the kind of just-for-fun pop number that could give these guys the hit single they so richly deserve.

More to the point is the band's unruffled dignity. The more ambitious songs, which in less capable hands could devolve into cheap sentiment, ring unerringly true throughout. The delicacy and understatement of the performances—the clear-as-a-mountain-stream guitar that punctuates *One Time One Night*, the worldly-wise Hank Williams-like cry that informs every note Hidalgo sings—undercut any hint of soap-opera bathos.

There is, of course, a precedent for the maturity of Los Lobos' brand of rock-and-roll: the Band. Like the four Canadians and the one unrepentant Arkansas cracker who made up that bunch of bar-wars veterans, the guys in Los Lobos have musical roots that run deeper than those of the careerists who glut our airwaves, as well as a kind of rueful, outsiders' take on the American experience that gives their work an astonishing poignance. "By the Light of the Moon," like the very

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BEST RECORDINGS OF THE MONTH

CHRISTIAN STEINER/DEUTSCHE GRAMMOPHON

best of the Band, and like precious little else around right now, is the kind of music that seems destined to last. That is, it's the sort of honest, unadorned expression that in comparison with the Bon Jovis of this world seems almost cleansing.

So trust me when I tell you to grab this album. Not only will it make you want to dance, but in the bargain it will make you feel like a better person. *Steve Simels*

LOS LOBOS: *By the Light of the Moon*. Los Lobos (vocals and instrumentals); other musicians. *One Time One Night; Shakin' Shakin' Shakes; Is This All There Is?; Prenda del Alma; All I Wanted to Do Was Dance; Set Me Free (Rosa Lee); The Hardest Time; My Baby's Gone; River of Fools; The Mess We're In; Tears of God*. SLASH/WARNER BROS. 1-25523 \$8.98, © 4-25523 \$8.98, © 2-25523 no list price.

THE ENCHANTING KATHLEEN BATTLE

KATHLEEN BATTLE has been heard to advantage on several labels and in a broad range of repertoire, but no single recording, perhaps, makes her own artistic personality quite as radiantly vivid as the new Deutsche Grammophon recording of the song recital she gave in Salzburg in August 1984 with James Levine as her superb associate at the piano. The program ranges from English songs by Purcell and Handel to German ones by Mendelssohn and Strauss, Mozart in German and Italian, French songs by Fauré, and a small group of spirituals.

Battle's way with Purcell and Handel is thoroughly of our time, in contrast to the vocal counterpart of the "original instruments" approach, and she does not attempt to vary her color much from one song or one group to another until she reaches the Fauré and the spirituals. But all of it is enchanting singing nonetheless, a radiant and joyous experience for performers and listeners alike. The Fauré songs are so seductively colored, and the spiri-



Battle and associate James Levine

tuals convey at once such animation and so much unassuming dignity. And Levine's partnership—needless to say, his contribution is no mere "accompaniment"—is so utterly attuned and complete. And the sound itself is so wide open and clear—and rather miraculously free of audience noises.

The accompanying booklet gives not a word of annotation, only a few paragraphs of biographical background pointing out the long and productive series of collaborations between the two performers and, of course, full texts and translations for all the songs. It's all we really need. Why it has taken two and a half years for Deutsche Grammophon to get this into circulation, I wouldn't attempt to guess, but what a lovely release it is! *Richard Freed*

KATHLEEN BATTLE: *Salzburg Recital*. Purcell: *Come All Ye Songsters; Music for a While; Sweeter Than Roses*. Handel: *O Had I Jubal's Lyre*. Mendelssohn: *Bei der Wiege, Op. 47, No. 6; Neue Liebe, Op. 19a, No. 4*. R. Strauss: *Schlagende Herzen, Op. 29, No. 2; Ich wollt' ein Sträußlein binden, Op. 68, No. 2; Säusle, liebe Myrte, Op. 68, No. 3*. Mozart: *Ridente la calma (K. 152/210a); Das Veilchen (K. 476); Un moto di gioia (K. 579)*. Fauré: *Mandoline, Op. 58, No. 1; Les Roses d'Ispahan, Op. 39, No. 4; En prière; Notre amour, Op. 23, No. 2*. Anon.: *Honor, Honor; His Name So Sweet; Witness; He's Got the Whole World in His Hand*. Kathleen Battle (soprano); James Levine (piano). DEUTSCHE GRAMMOPHON ● 415 361-1 \$10.98, © 415 361-4 \$10.98, © 415 361-2 no list price.

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CLASSICAL

- **BACH:** *The Well-Tempered Clavier; French Suites; English Suites*. Gould. CBS M3K 42266 (three CD's); MK 42267; M2K 42268 (two CD's). "Totally astonishing—pianistically, musically, intellectually" (March 1973).
- **BERLIOZ:** *Harold in Italy; Tristia; Les Troyens à Carthage: Prelude*. C. Davis. PHILIPS 416 431-2. "Outstanding" (September 1976).
- **GOUNOD:** *Roméo et Juliette*. Kraus, Malfitano; Plasson. EMI/ANGEL CDCC-47365 (three CD's). "Elegant" (July 1985).
- **SULLIVAN:** *H.M.S. Pinafore; Trial by Jury*. D'Oyly Carte Opera Company. ARABESQUE Z8052-2 (two CD's). Recorded 1927-30 and, rightly, treasured by Savoyards.
- **VERDI:** *Aida*. Caballé, Domingo; Muti. EMI/ANGEL CDCC-47271 (three CD's). "Resplendent" (January 1975).
- **VIVALDI:** *The Four Seasons*. Stern, Zukerman, Mintz, Perlman; Mehta. DG 419 214-2. "Exceptionally beautiful" (January 1984).



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AUDIO SYSTEMS



by Christie Barter
& Steve Simels

THE second annual Rock and Roll Hall of Fame induction dinner was held at the Waldorf-Astoria in New York because the Hall's Cleveland accommodations still aren't ready. It was, as expected, a dazzling all-star affair, culminating with a celebrity jam featuring **Bruce Springsteen, Chuck Berry, Keith Richards, Sting, Roy Orbison, Ruth Brown, John Fogerty, Chubby Checker, Carl Perkins, Peter Wolf, and Paul Butterfield.** The entire show was videotaped for the Hall's archives like last year's jam, but there are no plans to market it for home viewing. According to our spy who's seen the raw footage (including a Springsteen-Orbison duet on *Oh, Pretty Woman*), the performances are spectacular, and we say it's a shame the rest of us can't get a look. Dare we suggest a write-in campaign? Address the Rock and Roll Hall of Fame, 526 Superior, Suite 705, Cleveland, OH 44114. □



All-stars at the Waldorf: from left, Carl Perkins, Roy Orbison, Chubby Checker, Ruth Brown, Bo Diddley

MCA has just released disc-only versions of two classic films, each with a little something extra to take advantage of the format. The first is *Winchester '73*, a brilliant **Jimmy Stewart** vehicle (with an evocative score by Joseph Gershenson) that's generally agreed to have kicked off the so-called "adult western" genre of the Fifties and early Sixties. For this new version, Stewart and an interviewer provide a running commentary on the disc's second audio track (the first time a major star has provided such a service for a home-vid version of his own film).

Also out is a restored version of the original *Frankenstein*, including the famous censored scene where **Boris**

THE COWBOY AND THE MONSTER! Good news for film buffs and LaserDisc fans:

Stewart: a little something extra on videodisc



MCA HOME VIDEO

news, look for the band's next studio album in late 1987, as well as an Ocasek-produced recording by **Suicide**, the pioneer New York City minimalist duo. □

ON March 22 PBS airs its annual gala, this year called *A Musical Toast: The Stars Shine on Public Television* and hosted by **Itzhak Perlman.** The stars in question, representing a healthy cross section of the perform-



Orr (foreground) and Ocasek of the Cars: solos hit the charts

Karloff, as the monster, drowns a little girl, as well as a file of stills (lobby cards, behind the scenes photos, etc.) at the film's conclusion. Both discs list for \$29.95, and the films are presented, of course, in glorious, uncolored black-and-white. □

THIS YEAR'S MODELS! As fans of the **Cars** are doubtless aware, both of the group's principal singer-songwriters are currently on the charts with solo hits: **Ben Orr's** *Stay the Night*, **Ric Ocasek's** *True to You*. But what you might *not* know is that Orr's tune is an unheralded breakthrough of sorts—the first-ever Top 40 hit co-written by a TV game-show hostess, in this case **Diane Page**, who hosted Boston's *Big Money Lottery* back in the Seventies. (Trivia note: The last time a game-show host had a Top 40 hit was in 1962, when **Chuck Barris** wrote *Palisades Park*, immortalized by **Freddy Cannon**.)

Meanwhile, in related Cars

ing arts, include Broadway's **Bernadette Peters**, opera singers **Marilyn Horne, Roberta Peters, and Sherrill Milnes**, concert pianist **Alicia de Larrocha**, and cabaret singer-pianist **Michael Feinstein**, as well as the guitar-playing **Romeros** and the **Modern Jazz Quartet**. Among the highlights: **Leonard Bernstein** accompanying soprano **Eileen Farrell** in a selection of his own songs and songs by **Harold Arlen**.

The man behind all this is American conductor **John Mauceri**, the show's musical director. He's worked with a number of the participating artists before, notably—on discs—**Bernadette Peters**, with whom he recorded *Song and Dance*, her hit musical of last season, for RCA.

Mauceri also conducted the award-winning New World recording of **Bernstein's** *Candide* and is currently working on a studio recording of *My Fair Lady*, with **Kiri Te Kanawa** as **Eliza Doolittle**, **Jeremy Irons** as **Prof. Higgins**,

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DON PERDUE/WNET THIRTEEN



Mauceri and Peters: the stars shine on public television

John Gielgud as Pickering, and Peter Ustinov as Doolittle père. The orchestra in this London Records revival is the London Symphony, which Mauceri will also conduct in concert between recording sessions during the month of April. □

Makarova at the barre



MARTHA SWOPE/VIDEO ARTS INTERNATIONAL

JUST ahead of PBS's musical toast, the network is offering *Mancini & Friends*, a two-hour salute to the Oscar and Grammy Award-winning composer-conductor Henry Mancini. Among the friends appearing on the March 21 program is Johnny Mathis, with whom Mancini recently recorded an album of songs written for the movies, "The Hollywood Musical." □

ONE of the Russian artists-in-exile who have been invited to perform again in the Soviet Union is ballerina Natalia Makarova, the subject of a couple of recently released home videos.

From Kultur (and on Pioneer LaserDisc) comes "Nataasha," voted Best Arts Program of the Year in England, in which the celebrated dancer is featured as soloist and with well-known partners in a number of ballet excerpts, including scenes from *Romeo and Juliet*, *Manon*, *Carmen*, and *On Your Toes*. Makarova starred in *On Your Toes* on Broadway (with John Mauceri in the pit).

A tape from Video Arts International, "Natalia Makarova—In a Class of Her Own," takes the viewer backstage to show the ballerina practicing at the barre, in conversation with choreographer Roland Petit, and in rehearsals of Petit's ballet *The Blue Angel*. □

THE DUCK THAT WOULD NOT DIE! Look out, Donald and Daffy. MCA Home Video is trying to resurrect *Howard the Duck*, widely re-

garded as the dumbest movie of 1986. The \$30-million George Lucas megaflop about an intelligent fowl from another dimension, featuring music by synth-wizard Thomas Dolby (who should have known better), is wading its way into your home-video store at this very moment. Among the gimmicks that MCA is using to pitch the flick: a Win a Dream Date with Howard contest in which some lucky couple will be treated to an all-expenses-paid trip to the Duck's landing spot on Earth—Cleveland, Ohio. We are not making this up. □

GRACENOTES: Strange Rumbblings in Opryland: Nashville record execs are losing sleep trying to come up with a generic tag for the new crossover country music exemplified by Dwight Yoakam and Steve Earle. Leading contenders are said to be "Mutt Music" and "New Edge." Personally, we always liked "Cowpunk." . . . *Dune*, the David Lynch sci-fi epic with music by Toto, was a flop in its 140-minute theatrical version, but plans are afoot to rerelease it in a four-hour home-video version similar to the treatment afforded Ser-

gio Leone's *Once Upon a Time in America*. . . Good news from Minneapolis: Twin/Tone Records has signed NRBQ guitarist Big Al Anderson, whose first solo LP in more than a decade, "Party Favors," is due out momentarily. Even better, the Re-



UNIVERSAL CITY STUDIOS

Duck redux

placements have recorded twenty-two tracks for their next Sire LP. It was produced by Jim Dickinson, best known for his work with the Byrds, the Flying Burrito Brothers, and Alex Chilton's Big Star. □

Mancini, Mathis: together on TV and an album of movie hits



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*Discs and tapes reviewed by
Robert Ackart, Richard Freed,
David Hall, Stoddard Lincoln*

BRAHMS: *Piano Quintet in F Minor, Op. 34.* Emanuel Ax (piano); Cleveland String Quartet. RCA Ⓢ ARC1-4954 \$12.98, © ARE1-4954 \$12.98, © RCD1-4954 no list price.

Performance: *Lush*
Recording: *Very good*

Pianist Emanuel Ax and the Cleveland Quartet make an excellent team. Equally at home in the late-Romantic idiom, they feel this music as one, bringing to it a richness of tone and expressive power. Their passionate performance reaches emotional heights and plumbs emotional depths to capture the essence of this smoldering Brahms work. Good recording, too. *S.L.*

JANÁČEK: *Glagolitic Mass* (see Best of the Month, page 85)

LISZT: *Don Sanche, or the Castle of Love.* Gérard Garino (tenor), Don Sanche; Júlia Hamari (mezzo-soprano), Elzire; Ildikó Komlósi (mezzo-soprano), Zelis; István Gáti (baritone), Alidor; others. Hungarian Radio and Television Chorus; Hungarian State Opera Orchestra, Tamás Pál cond. HUNGAROTON Ⓢ SLPD 12744/45 two LP's \$21.96, © MK 12744/45 two cassettes \$21.96, © HCD 12744/45-2 two CD's no list price.

Performance: *Spirited*
Recording: *Bright*

That the pianistic giant Franz Liszt should have written *any* opera comes as a surprise. That his single venture in this genre was undertaken when he was a lad of thirteen and was produced in Paris in 1825 when he was barely fourteen is indeed noteworthy. While *Don Sanche*, which bears no imprint of early nineteenth-century operatic trends, enjoys even less popularity today than Mozart's *Bastien und Bastienne*, composed when Wolfgang was twelve, it is nonetheless delightful by virtue of its melodic invention. The pleasant-enough orchestration is not Liszt's but by Ferdinando Paer, young Franz's teacher at the time. Overall, the music fits the personalities and situations of the libretto, a medieval romance revised by two insignificant French writers of Liszt's time.

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Sviatoslav Richter joins the Borodin Quartet (above) for the Piano Quintet

COMPELLING SHOSTAKOVICH

Before considering the new EMI/Angel CD in which the Borodin Quartet performs Shostakovich's String Quartets Nos. 7 and 8 and Sviatoslav Richter joins the group for the same composer's Piano Quintet, there is some sorting out to do. The Borodin Quartet's personnel was changed since its recordings of these works were issued here on the Melodiya/Seraphim label in the late Sixties. (Some of those recordings have been reissued by the Musical Heritage Society.) The violinists Rostislav Dubinsky and Yaroslav Alexandrov left the quartet in 1976 and were replaced by the violinists Mikhail Kopelman and Andrei Abramenkov, who joined the violist Dmitri Shebalin and the cellist Valentin Berlinsky. It is *this* Borodin Quartet that is heard on the new CD. The Seventh Quartet was recorded in a studio in 1981, the Eighth in 1978, and the Piano Quintet with Richter was taped during live performances in the Great Hall of the Moscow Conservatory in December 1983. The new CD, then, represents neither a reissue of older material nor remakes by the same ensemble.

The five-movement Eighth Quartet is not only the numerical centerpiece of Shostakovich's cycle of fifteen quartets, it is probably the best known and most widely admired, both in its original form and in its various arrangements for string orchestra. It is in large part a work of lamentation. Its immediate predecessor, which takes only a little more than twelve minutes to play, is a still more personal expression of loss, composed shortly after the death of the composer's first wife and dedicated to her memory. Both works are incredibly

compelling as performed here. All their intensity and poignancy are brought out without the slightest hint of excess or a single unconvincing phrase. Musically as well as sonically, these versions are clearly superior to those in the previous Borodin Quartet recordings.

I've left the quintet for last, not because it comes last on the disc but because the performance is more difficult to describe than those of the two quartets. Since its première in 1940, the quintet has been acknowledged as one of the glories of Russian chamber music, and virtually every performance has sustained that impression. This one is more sober, more "inward," than any I have heard before, on records or otherwise. What is involved here is more than polish or precision or even "commitment." It is nothing less than utter absorption in and identification with the essential character of the music—the sort of thing that makes live recording worthwhile.

The recorded sound itself has less warmth than that of the studio-recorded quartets, but it is perfectly adequate, and the people lucky enough to have been in the audience must have been caught up in the music as fully as the players were, for there's not a peep out of them till the applause at the end. With a playing time of over seventy minutes, this CD is an outstanding value in every respect. *Richard Freed*

SHOSTAKOVICH: *Piano Quintet in G Minor, Op. 57; String Quartet No. 7, in F-sharp Minor, Op. 108; String Quartet No. 8, in C Minor, Op. 110.* Sviatoslav Richter (piano); Borodin String Quartet. EMI/ANGEL © CDC-47507 no list price.

The over-long overture, with its hints of Liszt's later fervor and energy, raises the curtain on a moon-drenched Gothic "castle of love" into which Don Sanche cannot enter because Elzire, his innamorata, does not return his affection—or so he thinks. Of course, by the conclusion of part two of this long one-act opera, Don Sanche has recovered from a mortal wound, Elzire has surrendered to his ardor, and all are happy. Meanwhile, soldiers march, peasants dance, and young lovers sing merry songs—something for everybody!

While dramatically the opera is pretty

naïve stuff, on this recording the very listenable and theatrical, if transparent, music is performed stylishly, with commendable suspension of disbelief, by an enthusiastic cast under an energetic conductor, Tamás Pál. Hungaroton is to be thanked for coming up with a recording that will be welcomed by Liszt enthusiasts and, as a delightful curiosity, by all opera buffs. *R.A.*

MOZART: Piano Quartet No. 1, in G Minor (K. 478); Piano Quartet No. 2, in E-flat Major (K. 493). Georg Solti (piano); Melos String Quartet. LONDON ◊

417 190-1 \$10.98, © 417 190-4 \$10.98,
© 417 190-2 no list price.

Performance: *Good*
Recording: *Piano spotlighted*

Mozart's piano quartets, the first significant works of their kind, seem to have been especially enticing to conductors who occasionally lay their batons aside in favor of the keyboard. Many of us first heard these marvelous works some forty years ago in the recordings George Szell made with members of the Budapest Quartet (still circulating on Odyssey), and more recently André Previn recorded them with members of the Musikverein Quartet in Vienna. Now there's a new set with Sir Georg Solti.

Like Szell and Previn, Solti has made other recordings as a pianist, but unless I'm mistaken, they must have been made a bit before we began to hear of him as a conductor: those I recall were also of Mozart—violin sonatas with Georg Kulenkampff. Yet it sounds here as if Solti never gave up the piano. These are lovely, stylish performances, with beautifully integrated keyboard and string elements. Unfortunately they are less than ideally balanced in the recording. Apparently it was deemed appropriate to emphasize Solti's star billing by placing his piano so far forward that much of the strings' contribution is obscured. This factor serves to strengthen my own loyalty to the superb recording of these two works by the Beaux Arts Trio with the violist Bruno Giuranna on Philips, one of the gems of the CD catalog. Philips has the instrumental balance just right, and the performances are even more fetching. The Beaux Arts' Menahem Pressler is possibly the most persuasive of all pianists in Mozart's chamber music, and every big line and little aside for his string colleagues makes its point with matching enforced eloquence. (For the record, both teams take the first-movement repeats in both works.) *R.F.*

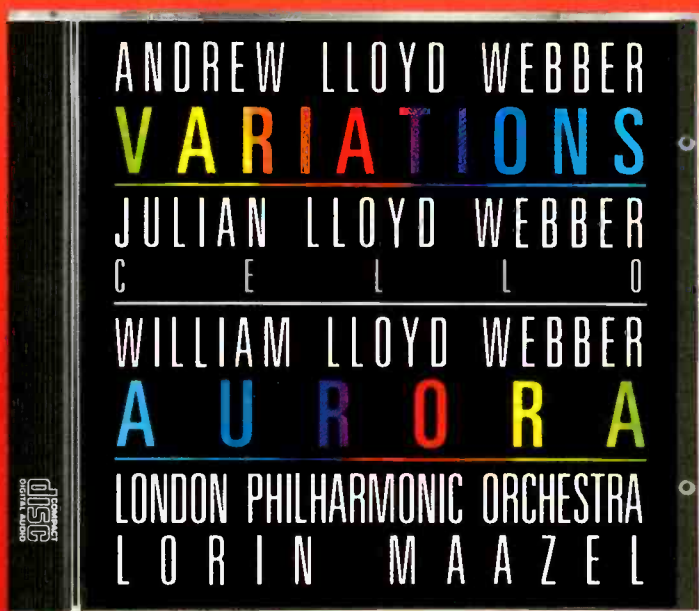
PURCELL: Ode on St. Cecilia's Day 1692 ("Hail! Bright Cecilia"). Taverner Consort, Choir, and Players, Andrew Parrott cond. ANGEL ◊ DS-38282 \$11.98, © 4DS-38282 \$11.98, © CDC-47490 no list price.

Performance: *Superb*
Recording: *Excellent*

Purcell's 1692 Ode on St. Cecilia's Day is perhaps one of the greatest pieces of English music ever written. It may be, in fact, one of the greatest odes ever written. Singing the praises of music can be pompous, but in setting Brady's text Purcell struck a remarkable balance between the witty descriptions of the various instruments and the Handelian sublimity of the final encomium to the patron saint of music.

Andrew Parrott's reading with the various Taverner forces is by far the best that has been recorded. The thirteen soloists are excellent in their dic-

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tion and precise renditions of Purcell's intricate coloratura. Their ensemble work is spot on, the chorus is clarion clear in its contrapuntal work and sumptuous in massed passages...

RODRIGO: Concierto de Aranjuez; Fantasia para un gentilhombre. CASTELNUOVO-TEDESCO: Guitar Concerto No. 1, in D Major, Op. 99. Eduardo Fernández (guitar); Adrich Chamber Orchestra, Miguel Gomez Martinez cond. LONDON 417 199-1 \$10.98...

Performance: Good Recording: Intimate

A particular attraction of this package is that it offers on one disc three of the most popular and engaging concerted pieces for guitar in the modern repertoire. Rodrigo's Concierto de Aranjuez has virtually achieved pop status since its premiere in 1940...

Soloist Eduardo Fernández shows up to particular advantage in the Fantasia and the Castelnuovo-Tedesco concerto, displaying both agility and subtlety. There are other performances of the Rodrigo concerto that match or surpass this one...

SCHUBERT: Die schöne Müllerin. Hermann Prey (baritone); Philippe Bianconi (piano). DENON 33C0 1072 no list price.

Performance: Excellent Recording: Clear, present

"Excellent" is such a meaningless word to describe any performance, but it nevertheless frequently encapsulates the quality of a recording in which the virtues are many. The work here of Hermann Prey and Philippe Bianconi is a case in point...

Wilhelm Müller's texts, and the third virtue is the singing itself, clear and easy. Prey uses his voice effectively as a medium of expression, not as a virtuoso instrument. Virtue four lies in Bianconi's careful attention to the delicate tracery of Schubert's piano writing...

SCHUMANN: Cello Concerto in A Minor, Op. 129; Konzertstück for Four Horns and Orchestra, Op. 86; Introduction and Allegro in D Minor for Piano and Orchestra, Op. 134. Frédéric Lodéon (cello); Pascal Devoyon (piano); Jean-Jacques Justafre, Jean-Paul Gantiez, Jean-Claude Barro, Alain Courtois (horn); Nouvel Orchestre Philharmonique...

Performance: Very good Recording: Excellent

The soloists in this Schumann package are all new to me, but they surely know their stuff, and Theodor Guschlbauer and the Nouvel Orchestre Philharmonique provide able collaborations throughout...

In the Introduction and Allegro, pianist Pascal Devoyon plays capably but succeeds no better than Vladimir Ashkenazy, in his London recording, when it comes to imbuing the piece with inner vitality. It starts out bravely enough, but after the halfway mark it becomes a mere exercise in note-spinning...

R. STRAUSS: Lieder. Jessye Norman (soprano); Geoffrey Parsons (piano). PHILIPS 416 298-1 \$10.98, 416 298-2 no list price.

Performance: Beautiful Recording: Excellent

This collection of twenty songs, selected for their contrasts in musical and poetic content, includes the short, recently discovered Malven (or Mallows), Strauss's very last song, which he dedicated to the Czech soprano Maria Jeritzka. It is a nice song, but far from the most important in the program...

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piano as one single instrument. Moreover, there is a joyousness in their performances that shines through even the serious pieces—the joyousness of making music together. The songs calling for a freely expressive treatment are handled with an almost rapturous abandon; the more introspective ones are presented with affecting simplicity. The delicately balanced recording, too, contributes to making this an unusually rewarding concert album. *R.A.*

VIVALDI: *L'incoronazione di Dario.*
John Elwes (tenor), Dario; Isabelle Pou-

lenard (soprano), Alinda and Arpago; Agnès Mellon (soprano), Oronte; Henri Ledroit (countertenor), Argène; Gérard Lesne (countertenor), Statira; Michel Verschaeve (baritone), Niceno; others. Ensemble Baroque de Nice, Gilbert Bezzina cond. HARMONIA MUNDI 1235/37 three LP's \$35.94, © 401235/37 three cassettes \$35.94, © 901235/37 three CD's no list price.

Performance: *Splendid*
Recording: *Excellent*

Here's the situation: After Ciro's death, the next king of Persia will be whoever

wins the hand of his daughter, Statira. The three contenders are Dario, of noble birth; Oronte, who has the support of the people; and Arpago, who controls the military. As full of intrigues as any ancient Oriental succession, this one is particularly messy because Statira's sister, Argène, is out to do Statira in and marry Dario herself, and Statira, despite her love for Dario, is not really all together and adds to the confusion by offering her hand to both Oronte and Arpago. Throw in Alinda, who is engaged to Oronte, and Niceno, a scheming tutor, and Adriano Morselli's complicated libretto is ready for Vivaldi's superb music.

Although *L'incoronazione* was one of Vivaldi's first operas, he was thirty-five when he wrote it and had developed a mature style. All the hallmarks of that style are present: strong melodies, colorful orchestrations with concerto-like bravura, richly expressive recitatives, and an animal excitement that keeps the action moving at all times.

The singers are superb, particularly John Elwes as Dario. His full-throated tenor is virile and flexible at the same time, and he offers us some of the finest Baroque singing of this generation. The two countertenors who portray the sisters have rich alto voices and sing with subtlety and finesse. Isabelle Poulenard, as both Arpago and Alinda, sings harshly and without vibrato when called upon to do so, while Agnès Mellon sings naturally, bringing an alluring humanity to Oronte. And Michael Verschaeve plays Niceno's role to the hilt.

There are, however, two disturbing things about this production. First, there's the distribution of the cast: three of the women's parts are sung by countertenors, and two of the male roles are taken by women. Even in an age when the castrato reigned supreme, such casting would have been considered unbalanced. After all, the original cast in 1717 used women for the two sisters, not castrati. As a result, many of the scenes that involve three women played by men and two men played by women come off a little like the Ballets Trockadero de Monte Carlo—no matter how perfect the point work and the *port de bras*, there is always a bit more sweat and five o'clock shadow showing than there ought to be.

Second, and less forgivable, is the entirely inadequate annotation. Even the LP set offers only the five-inch-square booklet designed for the CD jewel box, and the libretto it includes is a reduced reprint of the original Italian, so small and unclear that a magnifying glass is required to read it. There is no translation, only the briefest condensations in the form of puzzling one-liners. Pages and scenes go by with no English commentary at all.

Casting and notes aside, though, this is a wonderful performance of a fascinating work, and the recording itself is first-rate. *S.L.*



Photo: Massotti

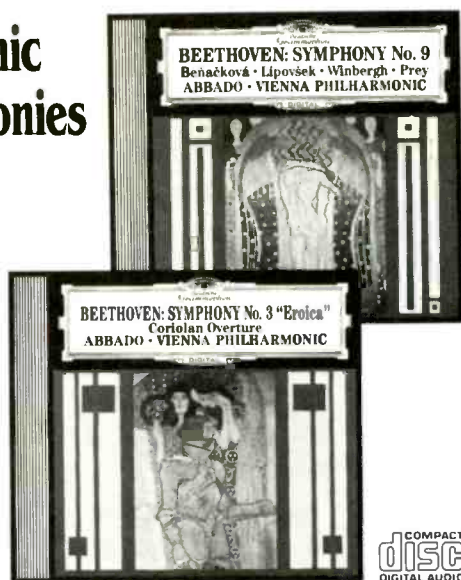
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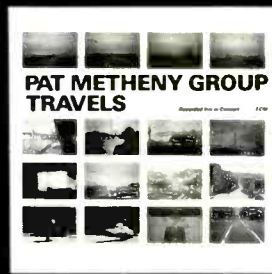
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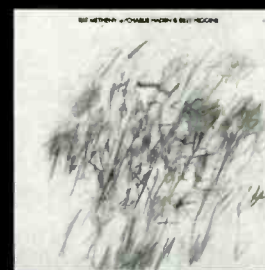
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Discs and tapes reviewed by
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ALABAMA: *The Touch*. Alabama (vocals and instrumentals); instrumental accompaniment. *You've Got the Touch; Vacation; Is This How Love Begins; Touch Me When We're Dancing; It's All Comin' Back to Me Now;* and five others. RCA 5649-1 \$8.98, © 5649-4 \$8.98 © 5649-2 no list price.

Performance: *Improved, but . . .*
Recording: *Very good*

Since Alabama now waits about a year and a half to put out a new studio album, listeners are justified in expecting marked improvement each time out. By that criterion, "The Touch" both succeeds and fails. On the plus side, the group has dropped the formulaic odes to the working class that dominated its last few efforts, as well as those tiresome Confederate flag-waving ditties, and concentrated on more pop-flavored songs, mostly standard fare about dating and falling in love.

On the other hand, there is some truly dreadful songwriting here, mostly in lead singer Randy Owen's *Vacation*, with lyrics too insipid to quote, and his obligatory *True, True Housewife*. To balance those songs—and guitarist Jeff Cook's routine *Cruisin'*—bassist Teddy Gentry contributes two respectable tunes, *I Taught Her Everything She Knows* and *Pony Express*, the latter an imaginative and well-crafted song that challenges the arrogance of technology.

Overall, this set is vastly more tolerable than Alabama's other efforts, with engaging vocal harmonies and first-rate instrumentals. The boys in the band actually played very little on their own past albums, and this one too has been beefed up by Nashville's finest studio pickers. If it worked for the Monkees, why not for Alabama? *A.N.*

BEN BAGLEY'S CONTEMPORARY BROADWAY REVISITED. Katharine Hepburn, Alan Arkin, Kaye Ballard, Helen Gallagher, Anthony Perkins, John Reardon, Diane Carnevale, Fay De Witt, Judy Gilmer, Mark Sendroff, Margaret Whiting (vocals); instrumental accompaniment. *The Kid Herself; Please Sir; Merry Little Minuet; Who Would Have Dreamed?; Sweet River; I*

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DAVE EDMUNDS

DAVE EDMUNDS'S new live album, "I Hear You Rockin'," has the sound and feel of a contractual throwaway—rush-job cover art, incomplete credits, and between-song patter that's all but inaudible. It just may be the cheesiest live record from a major artist since the Rolling Stones' "Got Live! If You Want It." That said, it is also an unalloyed delight, for the simple reason that, unlike most other contemporary concert albums, it refuses to take itself even remotely seriously.

Not that it's musically sloppy, of course. Unlike Rockpile, Edmunds's previous band, this lot has more on their minds than merely bashing out a few good tunes between beers. Actually, there's not an ill-considered note in this set. Edmunds's famous penchant for nailing down the perfect lick for even the briefest musical moment has clearly rubbed off on his collaborators, and despite the seeming simplicity of much of the material (the famous three or four chords that have sustained rock-and-roll since the beginning), the band's arrangements are remarkably sophisticated. In fact, they're identical, in most cases, to those on Edmunds's studio records. But, miraculously, for all the nit-picky attention to detail, you still get the feeling that these guys *are* just bashing out a few good tunes between beers. The combination of world-class musi-

anship and bar-band spirit make the performances here nothing short of irresistible.

The album is programmed as a sort of Dave Edmunds Greatest (Almost) Hits package, and it has almost everything you'd want (a notable exception is the bizarre version of Khachaturian's *Sabre Dance* he did back in 1968), from a definitive version of Elvis Costello's *Girls Talk* to Nick Lowe's *I Knew the Bride* (ditto). Rounding out the program are two oldies: Dion's hilarious macho classic, *The Wanderer*, and the other Elvis's *Paralyzed*.

By the time you get to the end of side two, you'll doubtless head back to side one to listen to "I Hear You Rockin'" all over again. In short, if this is, indeed, a contractual throwaway, it's the most entertaining one of 1987, and as they used to say on *American Bandstand*, you should buy it for your personal collection. *Steve Simels*

THE DAVE EDMUNDS BAND: *I Hear You Rockin'*. The Dave Edmunds Band (vocals and instrumentals). *Girls Talk; Here Comes the Weekend; Queen of Hearts; Paralyzed; The Wanderer; Crawling from the Wreckage; Slipping Away; Information; I Hear You Knocking; I Knew the Bride (When She Used to Rock and Roll); Ju Ju Man.* COLUMBIA FC 40603, FCT 40603, no list price.

Hate Spring; and twelve others. PAINTED SMILES PS 1381 \$10.98.

Performance: *Mostly highs*
Recording: *Very good*

Ben Bagley, that redoubtable chronicler of forgotten show music, has misnamed his latest album: contemporary Broadway isn't half this good! Actually, only five of the eighteen songs here are "contemporary"—from the Eighties, that is. Most were cut from Sixties and Seventies shows (and some go back even further) by Jerry Herman, Sheldon Harnick, Nancy Hamilton, John Kander

and Fred Ebb, and Harvey Schmidt and Tom Jones. All but a couple of the songs deserve the salvage job that Bagley and his impressive list of collaborators have done, even if some of the singers (Kaye Ballard and Helen Gallagher) are not at their best, and one, Katharine Hepburn, is only a bit better than Bette Davis at carrying a tune.

The highlights here are Judy Gilmer in Kander and Ebb's *The Kid Herself* from *Flora the Red Menace*, Susan Stroman and Jan Newberger in the same team's *Loopin' the Loop* from *Chicago*, Margaret Whiting's plaintive *Sweet Riv-*

er from the Schmidt-Jones *110 in the Shade*, John Reardon's romantic *The Room Is Filled with You* from the ill-fated Schmidt-Jones *Colette*, Alan Arkin's wry *What a Wonderful Way to Die* from an unproduced Schmidt-Jones score, and Judy Gilmer's *The Only Game in Town* from Kander and Ebb's *The Act*. And they're all greatly helped by the lively Broadway sound of Dennis Deal's arrangements. Roy Hemming

HAROLD BUDD: *Lovely Thunder*. Harold Budd (piano, violin). *The Gunfighter*; *Sandtrader*; *Ice Floes in Eden*; *Olancha Farewell*; and two others. EDITIONS EG/JEM EGED 46 \$8.98, © EEGCD 46 no list price.

Performance: *Otherworldly*
Recording: *Excellent*

When trying to describe the music of Harold Budd, writers usually end up comparing it to the sounds of places they've never been—the ocean depths, the night desert, deep space. That's less a reflection on their powers of description than it is a tribute to the music's power to lift a person out of the present. Labels such as avant-garde, minimalist, or New Age might help you find "Lovely Thunder" in your local record shop, but they're of little use in explaining Budd's singular brand of composition.

Using prepared piano, synthesizer, and, on the side-long *Gypsy Violin*, electric violin, Budd creates music that is at once enormous and intimate, calm and disquieting, relaxing and stressful. It is music based on what Budd freely admits is his limited keyboard technique. A short work may consist of no more than five chords, but, floating in a vast sea of undulating synthesizer, those five chords will creep, rumble, and reverberate with stunning effect. In *Ice Floes in Eden*, huge chordal chunks break off and crumble into swelling synthesized depths. In *Flowered Knife Shadows*, the hammering echo of prepared piano chops notes from an Eastern scale into splinters of quivering sound. In *Gypsy Violin*, a plaintive violin melody struggles to rise above a shimmering, Vaughan Williams-like string surface.

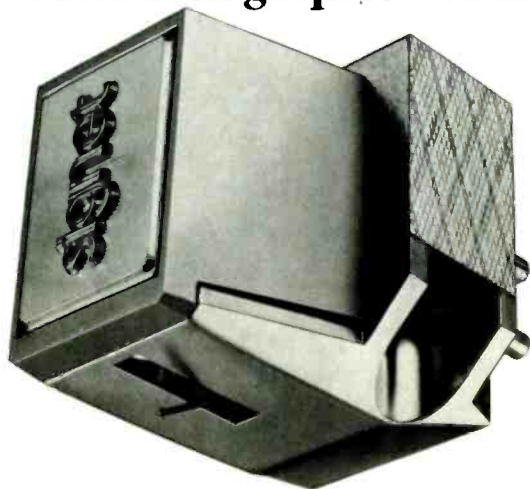
Budd seems to defy the very definition of music—notes in space over time—by suspending time and space. When one of his songs is over, you're not sure whether you've been listening for two minutes or ten. It's an experience you shouldn't miss. M.P.

DEAD OR ALIVE: *Mad, Bad, and Dangerous to Know*. Dead or Alive (vocals and instrumentals). *Brand New Lover*; *I'll Save You All My Kisses*; *Son of a Gun*; *Then There Was You*; and five others. EPIC FE 40572, © FET 40572, © EK 40572, no list price.

Performance: *Riveting*
Recording: *Excellent*

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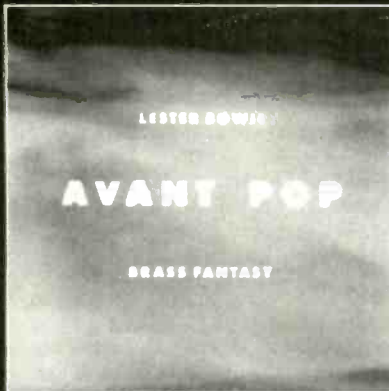
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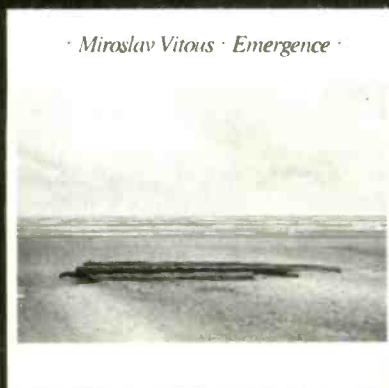
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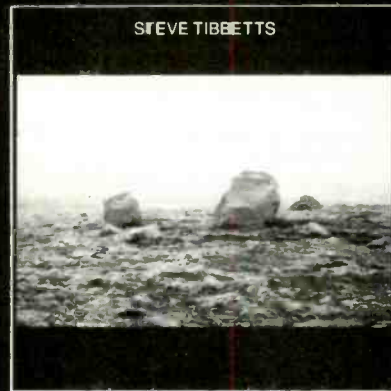
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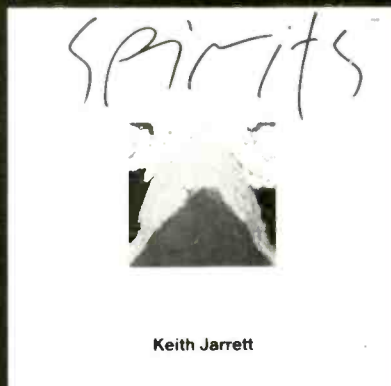
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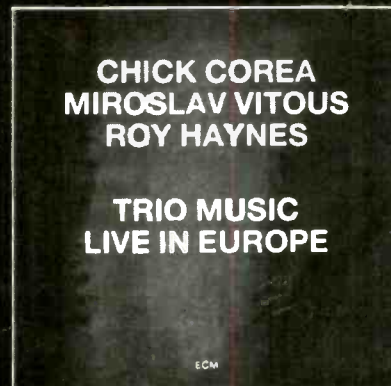
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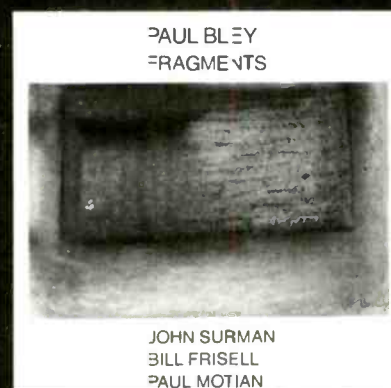
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"Mad, Bad, and Dangerous to Know" is a dance-or-die party album. High-speed and high-intensity, it weds grand, galloping rhythms with slicing guitar, hard-headed drumming, steely horn charts, a hundred or so wonderfully gimmicky sound tricks, and that bitchy, know-it-all swagger that makes even the most obvious observations seem like the latest inside stuff. Two, Dead or Alive is tantalizingly mysterious. The album's cover, with a nightmarish indigo portrait of, I assume, two of the group's members posed against a surrealist dreamscape, is deliberately ob-

scure—no lyrics, no instrument credits, not even names.

If the cover raises questions, the music inside just adds to them. It combines the fanzine sexiness of Wham!, the romanticism of ABC, and the unfettered rhythmic drive of Frankie Goes to Hollywood with the sinister motives of the Dead Kennedys. The lyrics to songs like *I'll Save You All My Kisses* are innocent and guileless, but somehow you imagine the guy singing them with zombie-like eyes agog, his hand clutching a cleaver. It's like having Bela Lugosi whisper sweet nothings in your ear.

Dead or Alive will *make* your next party, guaranteed. But don't play it when you're alone. *M.P.*

JOAN JETT AND THE BLACKHEARTS: *Good Music*. Joan Jett and the Blackhearts (vocals and instrumentals); Carl Wilson, Mike Love, Bruce Johnston, Al Jardine, Darlene Love (backing vocals); other musicians. *Good Music; This Means War; Fun, Fun, Fun; Black Leather*; and five others. BLACKHEART/CBS BFZ 40544, © BZT 40544, © ZK 40544 no list price.

Performance: *Good trash*
Recording: *Excellent*

Joan Jett, who is to flat-chested girls in leather jackets what Elvis Costello is to skinny guys with glasses—that is, somewhere between a role model and a cultural icon—returns in "Good Music" with another of her inimitable amalgams of early-Seventies glitter rock, heavy-metal aggression, and old-fashioned junk pop. And, as usual, your reaction to it, at least if you're not a member of her target demographic group, will probably depend on your tolerance for loud noises.

The new songs are generally formulaic Jett, but the revived oldies are interesting even when they don't work. Best of the bunch is Jonathan Richman's *Roadrunner*, which Jett approaches with a nicely ironic insouciance. Least impressive is *Fun, Fun, Fun*, which delivers considerably less of same than the Beach Boys' original (oddly, the album's title track, with several of the Boys chiming in, has considerably more spirit). Also noteworthy is Jett's version of Jimi Hendrix's *You Got Me Floating*, which would sound very nice in a segue from the Pretenders' recent cover of *Room Full of Mirrors*. Perhaps a revival in interest in Hendrix as a songwriter is brewing under our very noses.

The recording is excellent. I heard the CD, which somehow seems inappropriate for an album best appreciated on a car stereo after a six-pack of beer, but it's impressive nonetheless. *S.S.*

LOS LOBOS: *By the Light of the Moon* (see *Best of the Month*, page 86)

EDDY RAVEN: *Right Hand Man*. Eddy Raven (vocals); vocal and instrumental accompaniment. *Shine, Shine, Shine; The Best of Them; Sometimes a Lady; Right Hand Man; You're Never Too Old for Young Love*; and five others. RCA 5728-1 \$8.98. © 5728-4 \$8.98.

Performance: *New approach*
Recording: *Good*

Eddy Raven is one of those second-string Nashville singer-songwriters who gets mentioned occasionally but not nearly enough. Yes, he's been known to write songs that are so sugary they'd gag Mary Poppins (*Thank God for Kids*),

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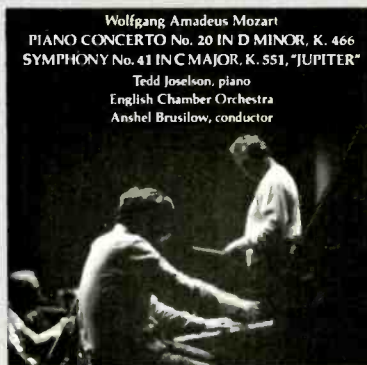
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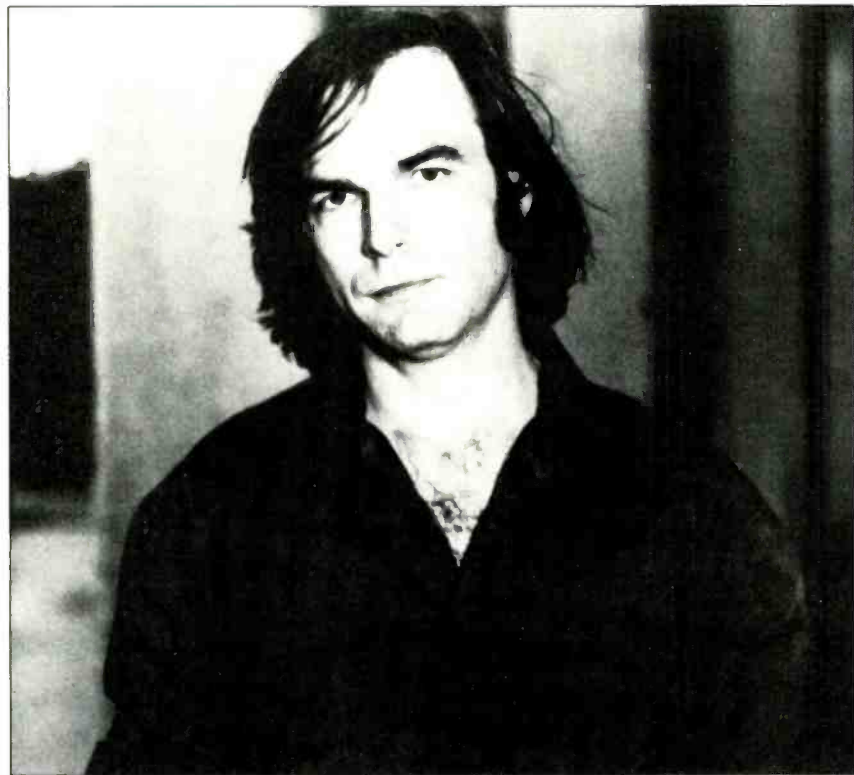
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THE EYE OF DAVID OLNEY

A TRIP through David Olney's new recording, "Eye of the Storm," is something like sneaking a peek at all eight features at the neighborhood shopping-mall movie complex. Behind door No. 1, there's intrigue and terror, behind No. 2, action-adventure, and behind the third, romance—tinted, perhaps, with the faintest streak of sadism. At the movie house, of course, when things get uncomfortable, you can always get up and leave. But with Olney, once you've stopped to look, the chairs grow imprisoning arms, and the windows board up and shut tight: Olney's got you where he wants you.

On the surface, the rough-voiced Olney seems a pleasant enough fellow—a singer-songwriter with a little bit of a pitch problem, passing the time with a guitar and a stool. But in the Hitchcock thrillers, it was the choirboy killers who stabbed the deepest wounds. And Olney, the "dangerous man" of one of his compositions, wields a mean knife.

For example, one of his edgier songs, *I Keep My Fingers Crossed*, finds an aspiring actor writing a letter to a friend, imparting the news that he's up for a part as a hired killer. The friendly mis-sive turns brooding, however, as the writer drifts off and assumes the personality of a man who kills for a living—and decides he's not such a bad guy after all. Trust me—it gets downright spooky. And so does Olney's tracing of the voyage of the *Titanic*, told from the

viewpoint "of this bitter, Northern sea/ I've waited in the dark/For near eternity/ . . . My frozen arms are reaching/ . . . Come to me."

For those who prefer a lighter touch, however, there's always a lyrical change of scene, the sweet embracing of *Theresa Maria*, for instance, or this whimsical thought: "If I were Saturday night/And you were Sunday morning/For a fleeting moment/We could touch at midnight."

Dave Olney isn't a kid. He's kicked around Nashville in one incarnation or another for fifteen years or so. But like the other writers in town he started out with—Guy Clark, Rodney Crowell, and Townes Van Zandt among them—he is destined to see his day. And like the characters in his best songs—or in classic Hollywood *film noir*—Olney seems somehow ambiguous, stronger of mood than of intent. But you'll know him when he walks into the room. He'll be the one in the raincoat. *Alanna Nash*

DAVID OLNEY: *Eye of the Storm*. David Olney (vocals, guitar, harmonica); Thomas Goldsmith (guitar); Roy Husky, Jr. (bass); other musicians. *Saturday Night and Sunday Morning; I Keep My Fingers Crossed; Theresa Maria; A Dangerous Man; If It Wasn't for the Wind; Who Knows Better Than I; Queen Anne's Lace; Titanic; Eye of the Storm; Steal My Thunder; My Baby's Gone; Ain't It That Way*. ROUNDER 3099 \$8.98.

but he's also capable of turning out snappy little finger-poppers that somehow bore to the heart.

Like so many other singer-songwriters in Nashville, however, Raven has had more success writing hits for others than he's had singing those songs himself, and few people know who he is. For his new album, producer Don Gant, who came out of retirement to man the control board, concentrated on presenting Raven the singer instead of Raven the writer. So we get a smorgasbord of material, most of it coming down squarely on the pop side of country-pop (with some r-&-b thrown in), and only two of the tunes are Raven originals.

Raven does a credible job on all of it, even the schmaltzy *But She Loves Me*. But he really shines on *The Best of Them*, a through-a-glass-darkly gem that may or may not be about a man's obsession with a Chinatown prostitute. On this particular cut, the mix tends to swallow Raven's delivery, but it can't obscure the fact that this song alone is worth the price of the album. As for the rest of it—well, you'll hear it on the radio. *A.N.*

LINDA RONSTADT: *For Sentimental Reasons* (see Best of the Month, page 85)

SYLVESTER: *Mutual Attraction*. Sylvester (vocals); vocal and instrumental accompaniment. *Someone Like You; Living for the City; Summertime; Mutual Attraction*; and four others. WARNER BROS. 25527-1 \$8.98, © 25527-4 \$8.98.

Performance: *Plenty of power*
Recording: *Very good*

Long before Boy George, there was Sylvester. A powerhouse performer, he belts out songs in a muscular falsetto, blending traces of gospel with rhythm-and-blues and a touch of rockish sass. "Mutual Attraction" presents him in peak form—boldly assertive, with a female chorus shouting out behind him. Just listen to what he does with Stevie Wonder's *Living for the City!* It packs such a wallop you feel you could walk all the way from New York to L.A. if you could just keep on hearing it. This is a vigorously executed album with first-rate background vocals and high-energy instrumentals that perfectly complement Sylvester's strutting style. Power to Sylvester! *P.G.*

TESLA: *Mechanical Resonance*. Tesla (vocals and instrumentals). *EZ Come EZ Go; Cumin' Acha Live; Gettin' Better; 2 Late 4 Love; Rock Me to the Top*; and seven others. GEFEN GHS-24120 \$8.98, © M5G-24120 \$8.98.

Performance: *Electrifying*
Recording: *Very good*

The band's name says everything you need to know about their music. Nikola

Tesla (1856-1943) was a brilliant though eccentric scientist, a pioneer in high-tension electricity and a rival of Thomas Edison. His inventions included alternating-current (AC) transmission and a system for transmitting power without wires—which it was feared at the time would electrify the earth's entire atmosphere. Whether Tesla would appreciate his namesakes' music is a matter of some doubt, but he certainly would have been gratified by their studious application of electrical current.

Tesla's "Mechanical Resonance" is what heavy-metal *should* be—not a forum for satanic death rites or an incitement to rebel against authority (which for the average heavy-metal listener isn't the military-industrial complex but mom and homework), just a simple demonstration of concentrated electric-guitar power. And it's a good one.

Tesla's make-up is by the book: dual lead guitarists, both advocates of the slash and burn school, mega-steroid drumming, and that sneering, whimpering vocal style pioneered by Robert Plant and taken up, no questions asked, by just about every heavy-metal band ever since. The songs, which have generic metallic titles like *EZ Come EZ Go*, *Cumin' Atcha Live*, and *2 Late 4 Love*, are entirely forgettable, but the performances are sure to inspire virtuoso displays by air guitarists around the country. *M.P.*

LUTHER VANDROSS: *Give Me the Reason*. Luther Vandross (vocals); vocal and instrumental accompaniment. *Stop to Love; See Me; I Gave It Up (When I Fell in Love); So Amazing; Give Me the Reason; There's Nothing Better Than Love;* and three others. EPIC FE 40415, © FET 40415, © EK 40415, no list price.

Performance: *One of his best*
Recording: *Excellent*

Luther Vandross may have shed more than a hundred pounds, but his handsome new image in the cover photo of this album is not accompanied by any slimming of his vocal presence. "Give Me the Reason," in fact, is one of his best recordings, brimming with the sort of romantic ballads Vandross has always sung so well. He also wrote or co-wrote all but one of the songs here. The best of his originals is *So Amazing*, which starts out sounding like *Just the Way You Are* but soon finds its own direction. On a comparable level is the tenderly interpreted *Because It's Really You*. As usual, though, the most memorable selection is a pop classic he's reworked to suit his style. Here it's the Bacharach-David evergreen *Anyone Who Had a Heart*, which Vandross serves up in a haunting, sensuously slow arrangement. If this album is representative of what we can expect from Vandross in the future, we're in for some real delights. *P.G.*



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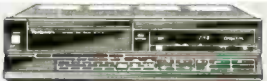


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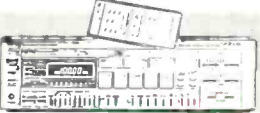
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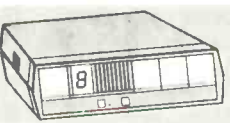
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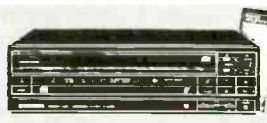
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“THE BIRTH OF RHAPSODY IN BLUE”

AN important Latin American critic and musical sociologist whose name, alas, escapes me coined the term *mesomusica* for that huge, fascinating gray world of light commercial music that lies between true folk and popular music on the one hand and classical high art on the other. The Paul Whiteman Orchestra's famous Aeolian Hall concert of 1924, the one that introduced George Gershwin's *Rhapsody in Blue*, was a kind of apotheosis of *mesomusica*. And conductor Maurice Peress's extraordinary re-creation of that event in a wonderful new recording on the MusicMasters label has elevated Whiteman's version of *mesomusica* to the status of an art form.

Whiteman was not, repeat *not*, the first to treat jazz seriously in symphonic form in a concert hall. James Reese Europe's Clef Club Symphony attempted to make “a lady out of jazz” before World War I. But Reese Europe was a black man, and in one of those wonderful ironies of history, it was left to Whiteman and his all-white orchestra to accomplish the miracle.

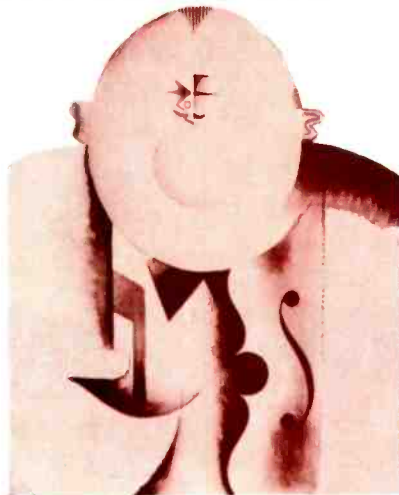
Whiteman, though a much-admired and successful band leader, did not really understand jazz or play it. And Gershwin, who besides Duke Ellington was the most gifted American composer of his generation, was scoffed at for his pretensions to being a jazz composer. It ain't jazz, the critics scoffed, and they were not wrong.

But if it ain't jazz, what is it? *Mesomusica* is just a way of putting a name on it. In fact, as this recording clearly demonstrates, Whiteman knew quite well what he was doing. He wasn't trying to create jazz, and he wasn't even really trying to make jazz respectable. He was trying to fuse the serious, high-minded respectability of classical music with the vitality of “modern music,” by which he meant his dance band with its inclusion of jazz instrumentation and its complement of clever arrangers like Ferde Grofé.

Can we take the Whiteman/Grofé *mesomusica*—light music, *kitschmusik*, the early version of easy listening—seriously? Yes, because Gershwin validated it. And we can enjoy it for what it is in this admirable, sparkling restoration.

Whiteman organized his concert in a surprisingly didactic way. He called it “an experiment in modern music” and filled the printed program (and the newspapers) with elaborate notes, explanations, justifications, theories, and apologias. The concert was divided up into sections such as “True Form of Jazz,” “Legitimate Scoring vs. Jazzing,” and “Adaptation of Standard Selections to Dance Rhythm.”

In the end, the program turned out to consist mostly of elegant dance-band



Paul Whiteman: *It ain't jazz, the critics scoffed, and they were not wrong.*

arrangements of popular songs and semi-classics, but Peress tries to show that some of the jazzy rough-and-tumble of Nick LaRocca's *Livery Stable Blues*, which opened the concert, persists in *A Rhapsody in Blue*, which closed it. And his performance of the Gershwin piece here proves that it's made of sterner stuff than the rest.

Until relatively recently, the *Rhapsody* was only known in Grofé's later symphonic orchestration—what Peress calls the “Hollywood Bowl” version. Peress takes the problems of the work's orchestration as seriously as any classical musicologist working on Bach: Gershwin's original two-piano score, the original Grofé score and parts, and the original 1924 recording by Gershwin and Whiteman are Peress's sources. He has actually restored some music and some scoring, fixed a few errors, and re-established what Baroque scholars call authentic performance practice. And he has pianist Ivan Davis and an orchestra of crackerjack musicians who specialize in old jazz and dance-band styles.

Davis plays with flair but also with surprising freedom; it's just right. Musicology aside, the music really jumps. The *Rhapsody* has an etched quality here—a bite, a clarity, and a decisiveness that have long disappeared from concert performances. In my opinion it will be as hard to listen to the usual symphonic *Rhapsody* after this performance as it is to hear symphonic Handel after an original-instruments reading led by Christopher Hogwood or John Eliot Gardiner.

Gershwin, of course, was not the only composer commissioned by Whiteman for the occasion. Victor Herbert's *Suite of Serenades*—his last composition—seems like an anachronism next to Gershwin; the commission was, in fact, a tasteful tribute to the leading *mesomusica* composer of an earlier day. White-

man was proving his modest point by having a popular light-music composer of unquestionable taste and repute validate his dance band by writing for it.

Neither Herbert's contribution nor the shallow cleverness of Zez Confrey (*Nickel in the Slot*, not *Kitten on the Keys*, is the fun piece) can hold a candle to Gershwin, but it is delightful to hear the music played in style. The real star after Gershwin was not Confrey but the relatively unsung Ferde Grofé, the man who actually set down the largest number of the notes played at the concert. Grofé was the real *mesomusica* man, a positive genius at blending jazzy horn sections with dance-band rhythm and classical strings. Although his horn scoring is rarely really hot, it had a sound of its own and was certainly one of the ingredients that later went into the development of big-band arranging.

What makes this recording worthwhile beyond the flagship *Rhapsody* is the band. Dick Hyman impersonates Zez Confrey at the keys—more of a tiger than a kitten. The tuba and bass-saxophone player is Vince Giordano, founder and leader of the Nighthawks, a band specializing in playing old dance-band arrangements. Lamar Alsop is the concertmaster of the New York City Ballet and founder of the Carnegie String Quartet; in his spare time he plays saxophone for Vince Giordano! The list of players goes on like that. The issue is style. The modern term might be crossover. The results are, as in most classical music, re-creative rather than truly creative, but the re-creation is vital and alive, not stuffy and musicological. If early jazz and dance-band music turns into American classical music, let's at least hope that we always keep it alive and re-created with as much pizzazz as it gets here!

Eric Salzman

THE BIRTH OF RHAPSODY IN BLUE: Paul Whiteman's Historic Aeolian Hall Concert of 1924. LaRocca: Livery Stable Blues. Baer: Mama Loves Papa. Thomas: So This Is Venice. Silver: Yes We Have No Bananas. Shoenerger: Whispering. Brahm: Limehouse Blues. Rose: Linger Awhile. Kern: Raggedy Ann. Confrey: Kitten on the Keys: Three Little Oddities; Nickel in the Slot. Berlin: Orange Blossoms in California; A Pretty Girl Is Like a Melody; Alexander's Ragtime Band. Elgar: Pomp and Circumstance March No. 1. Grofé/De Rose: Russian Rose. Logan: Pale Moon. MacDowell: To a Wild Rose. Friml: Chansonette. Herbert: A Suite of Serenades. Gershwin: Rhapsody in Blue. Ivan Davis, Dick Hyman (piano); orchestra, Maurice Peress cond. MUSICMASTERS ● 20113/4 two LP's \$21.96, © 40113/4 two cassettes \$21.96, © 60113T two CD's \$25.98.

ART BLAKEY: *Feeling Good*. Art Blakey and the Jazz Messengers (instrumentals). *On the Ginza; Crooked Smile; Obsession; Caravan; One by One*; and three others. DELOS © D/CD 4007 no list price.

Performance: *Succinct*
Recording: *Very good*

Like the Modern Jazz Quartet and the Duke Ellington Orchestra, most successful enduring jazz aggregations have owed a good measure of their longevity to their consistent personnel, but Art Blakey's Jazz Messengers have remained center stage for over three decades with only one constant: Blakey himself. Still, consistency does play a role in the Messengers' success, for the sixty-seven-year-old drummer has maintained an uncanny ability to discover new talent and provide fertile ground for it to grow.

"Feeling Good" features over seventy minutes of music by the latest edition of the Messengers, digitally recorded directly to two tracks for release on compact disc. The front line consists of trumpeter Wallace Roney, alto saxo-

phonist Kenny Garrett, tenor saxophonist Jean Toussaint, and trombonist Tim Williams. Toussaint, who also contributed *Crooked Smile*, a composition reminiscent of *Blues March*, is almost a veteran Messenger at this point. Roney is an agile, imaginative trumpeter whose tune *Obsession* reveals complex musical thinking that augurs well for the future. Garrett contributes superb, well-constructed alto solos, and there is abundant promise in Williams's trombone. By adding the trombone, Blakey has given "Feeling Good" a fuller, almost big-band sound, which the group wears well. This is a thoroughly enjoyable, worthy addition to the awesome Messenger library, now approaching a staggering ninety albums—a collection that could serve as a Who's Who of modern jazz. C.A.

PHIL WOODS QUINTET: *Gratitude*. Phil Woods (clarinet, alto saxophone); Tom Harrell (trumpet, flugelhorn); Hal Galper (piano); Steve Gilmore (bass); Bill Goodwin (drums). *Tenor of the Times; Ya Know; Serenade in Blue; My Azure; Times Mirror; Another Jones;*

Gratitude; 111-44. DENON © 33CY-1316 no list price.

Performance: *Spirited bop*
Recording: *Good*

Phil Woods has always been an eloquent player, and though he has not made stylistic strides since first emerging as a Parker-inspired altoist, he has kept the flame of bop flickering. His new CD, "Gratitude," features the quintet Woods formed in 1984 with trumpeter Tom Harrell and a rhythm section led by pianist Hal Galper.

I would have preferred closer mixing on Galper's piano during some of the solos (in *Times Mirror*, for instance) and, assuming that it is artificial, a little less echo on the horns would have enhanced the overall sound, but these are minor gripes. In the main, this is a satisfying album full of excellent individual and ensemble performances. Among the highlights are Woods's descent into his solo on *Ya Know* and his more pensive statement on Glenn Miller's *Serenade in Blue*, as well as everybody's raised spirit on *Tenor of the Times*. C.A.

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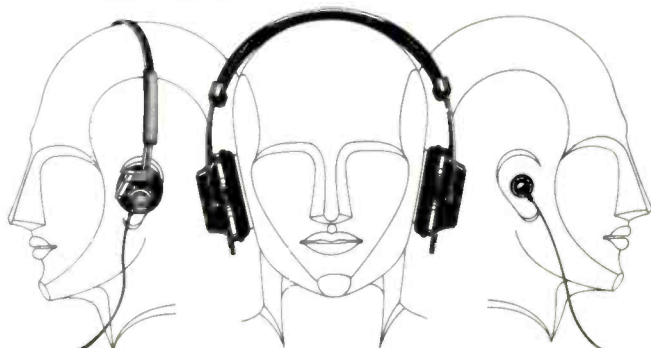
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DAT FINALLY RELEASED (Continued from page 18)

001 include a quadruple-oversampling digital filter, dual D/A (digital-to-analog) converters, and independent left/right A/D (analog-to-digital) converters. Two sets of analog inputs are also provided, with a front-panel selector switch, presumably to enable direct connection to a source component, along with a preamplifier-out jack.

The Aiwa XD-001 is incapable of dubbing CD's digitally, since it cannot record at the CD's 44.1-kHz sampling rate. But it can make direct digital copies from another DAT deck.

Because of the DAT format's large subcode capacity (four times that of CD), the XD-001 has the capability to generate one graphic image every 30 seconds in addition to its audio output. Moreover, it offers a variety of subcode-driven playback functions, including music search, ten-key direct selection access (considerably slower than that of a CD player, as the demonstration showed), and user-defined start and skip ID location marking that tells the player where to start playback or skip forward.

Several reporters asked when Aiwa plans to sell the DAT deck in Europe and North America. President Nakajima said he wished to offer it as soon as possible but admitted that concepts of copyright and relationships with record manufacturers in other areas differ from those in Japan.

That very point may be the key to the early release of DAT in Japan, a country where the perceived value of software of all types is comparatively low. Japanese musicians receive very small royalties for their recorded work (which has a short marketable "shelf life"), and most musicians are on salary from their respective production and recording companies. In Japan, rentals of recorded music, videos, and even computer software are big business, with most outlets offering on-the-spot copying services. An understanding of such factors makes it clear why DAT has now become a reality in this part of the world. □

MOVIE MUSIC ON CD (Continued from page 61)

levar and the forever fabulous *Philadelphia Story*. RCA's Waxman CD, gorgeously rerecorded by Charles Gerhardt and the National Philharmonic Orchestra, includes excerpts from all of those as well as bits and pieces from *To Have and Have Not*, *Rebecca*, and *A Place in the Sun*. It's also about twenty minutes longer than the corresponding LP version and one of the most entertaining film albums around.

SOPHIE'S CHOICE (Marvin Hamlisch). SOUTHERN CROSS SCCD 902 (31:39).

Marvin Hamlisch has scored a lot of interesting films over the years (*The Swimmer*, *Bananas*, *Ordinary People*, the TV version of *A Streetcar Named Desire*), and when he's in the mood he can turn out a melodically graceful, elegaic, Coplandesque American score with the best of them. This one for Alan Pakula's deft version of the William Styron novel is particularly charming—understated, sensitive, and beautifully attuned to the mournful mood of the film. And to think it's by the same guy who wrote *Sunshine, Lollipops and Rainbows* for Lesley Gore.

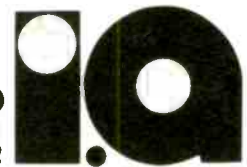
TOP GUN. COLUMBIA CK 40323 (38:46).

Top Gun, the biggest-grossing film of 1986, is so utterly shameless a piece of jingoistic claptrap that it makes *An Officer and a Gentleman* look like *All Quiet on the Western Front*, but this is the Eighties, and America is "standing tall again." The film's questionable politics aside, however, one can only stand in awe of its soundtrack, as cannily assembled a piece of pop product as has ever been marketed. Featuring songs by such AOR luminaries as Cheap Trick and Loverboy as well as major hits by Kenny Loggins and Berlin, the *Top Gun* score is alternately martial, languid, and danceable, the kind of ear candy that produces an almost Pavlovian response in its teenage audience, most of whom (according to demographic surveys) have seen the film more than once, as often for the songs as for the film's admittedly flimsy drama. Think of this as history's first rock-and-roll recruitment film if you must, as long as you acknowledge that it's one of the most high-powered CD's around. □

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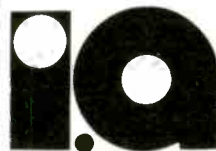
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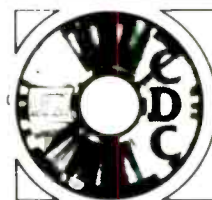
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strategically located within the enclosure's vent.

The PSW200 has a 15-inch long-throw woofer with a 2-inch voice coil and a 38-ounce barium-ferrite magnet. Nominal impedance is 2 ohms, and the crossover frequency is 80 Hz. The subwoofer measures 22½ inches wide, 19½ inches high, and 18¾ inches deep. Price: \$699.95. American Acoustics, Dept. SR, One Mitek Plaza, Winslow, IL 61089-0038.

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track number, elapsed time in the track being played, the track number being entered into memory during programming, and the current track/index numbers during search. Rated frequency response is 5 to 20,000 Hz, dynamic range and signal-to-noise ratio are both 90 dB, and total harmonic distortion is 0.005 percent at 1,000 Hz. Price: \$199. RCA, Dept. SR, 600 N. Sherman Dr., Indianapolis, IN 46201.

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ARC

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NEW PRODUCTS



AR

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select inputs, scan for AM and FM stations, adjust the volume, activate the volume mute, and turn the receiver on and off.

The amplifier section's steady-state output is rated as 60 watts per channel into an 8-ohm load or 90 watts per channel into a 4-ohm load, with 2 dB of dynamic headroom. Stereo 50-dB quieting sensitivity is 37.2 dBf (4.0 μ V), A-weighted FM-stereo signal-to-noise ratio is 75 dB at 65 dBf, and capture ratio is 1.0 dB. Price: \$599.95. AR/Acoustic Research, Dept. SR, 330 Turnpike St., Canton, MA 02021-2300.

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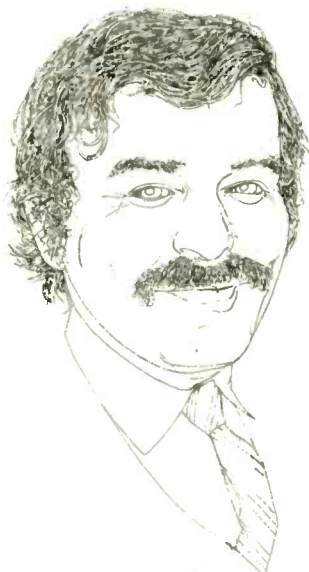
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APRIL

by Ralph Hodges



Sleuthing Sonic Differences

IN the January issue, STEREO REVIEW presented test results that strengthened the case for most good amplifiers sounding alike. I have my own views on this matter, of course, but it occurs to me that many readers would prefer to convince themselves, by themselves. If so, the situation seems to call for a little at-home foray into differential-signal testing.

The essence of such testing is to branch an audio signal into two paths, sending one through a reference device and the other through some device under test, then recombining the paths at their respective outputs *out of phase*. If, at the point of recombination, the levels of the two components of the signal are made precisely identical, the components will cancel each other into utter nothingness—*provided* that the two devices they have passed through are precisely identical in their electrical characteristics.

If the test and reference devices are *not* identical, the sought-for condition of absolute silence (except for a trickle of hiss, which this test procedure cannot normally avoid) will not be obtainable. Something of the original signal will always be heard, and that something represents no more or less than the *difference*

between the two devices under test.

The test has several beauties. First and foremost, the audio signal used can be anything, including music—the more complex and demanding to reproduce the better. Second, all forms of signal alteration and distortion, well-known and as yet unknown, are represented, although there is no quantifiable discrimination between types. Third, the to-be-tested “device” can be almost anything, including just a piece of cable (please don’t ask me what brand of cable). And, finally, the test asks the listener to identify nothing more than silence or the lack of it, and there’s little arguing with that sort of judgment.

This type of test has been around for ages, and some ten years ago I worked out a version for preamplifier and signal-processor testing that is conceptually simple and quick and easy to experiment with. It is also conceptually flawed, but nevertheless . . .

To verify your ability to carry out the test, and to gain some preliminary experience, begin by connecting one of your loudspeakers differentially (the other will not be used). To do this, connect the plus (+) terminal of one amplifier channel to either speaker terminal and the plus terminal of the second amp channel to the other speaker terminal, disconnecting everything else from the amplifier’s speaker outputs (unless the amp’s manufacturer forbids this sort of operation, in which case, go no further).

Switch the preamplifier to mono (or hook one channel of the intended program source to both its inputs using a Y-connector), defeat the tone controls, and turn up the gain cautiously. Any sound you hear should not be there. To get rid of it, manipulate the balance control in search of a null in the signal. You’ll be surprised at how sensitive an adjustment this is; often I’ve had to fit a larger knob on the control shaft temporarily to keep my fingers from overshooting or undershooting the mark.

If the null is unattainable, the two electronic channels of your system are not performing identically, which information may be of some interest. If you *can* get the null, the

knob’s position represents the “electronic center” of your system and should be marked for future reference, even though it may bear little relation to the system’s “acoustical center.”

Once you are satisfied the null is possible (and give up here if isn’t), you may proceed to comparative testing. Leaving the amp-speaker connections as they are, use Y-connectors to send a signal from the program source, feeding one branch to your preamp input, just the same way as before, and the other to the device to be tested.

Unplug one channel of the preamp’s output from the power amp and connect instead the output from the device under test. Then, again cautiously, turn up the volume and go for the null by adjusting the level controls of both the system preamp and the device under test. What you hear when you’ve done your best is the difference between the two—and the “listenability” of that difference can be as important as its existence.

Note especially that there *must* be some way of limiting the level of the signal passing through the device-under-test branch. If the device is an ordinary preamp, its own volume control will do. Otherwise, any output-level control on the program source—tuner, tape deck, CD player—will serve, as will attenuators on the power-amp inputs; it doesn’t matter for the validity of the test. But *something* must be used, or you risk holocaust.

The conceptual flaws referred to earlier? Well, considering the number of attenuators, etc., that might get involved, it’s unlikely that the loading on both signal branches will be equivalent, and this will affect the behavior of some components. But serious thought about the theory of the test will get many experimenters around most of the consequences.

Otherwise? Well, if you decide to test your preamp against, say, a simple length of cable and can’t get a null, you’ll have no way of telling where the difference-causing mechanism lies. The probability, however, is still that the cable, whether it is inexpensive 16-gauge wire or Monster Cable, is the one that’s right. □

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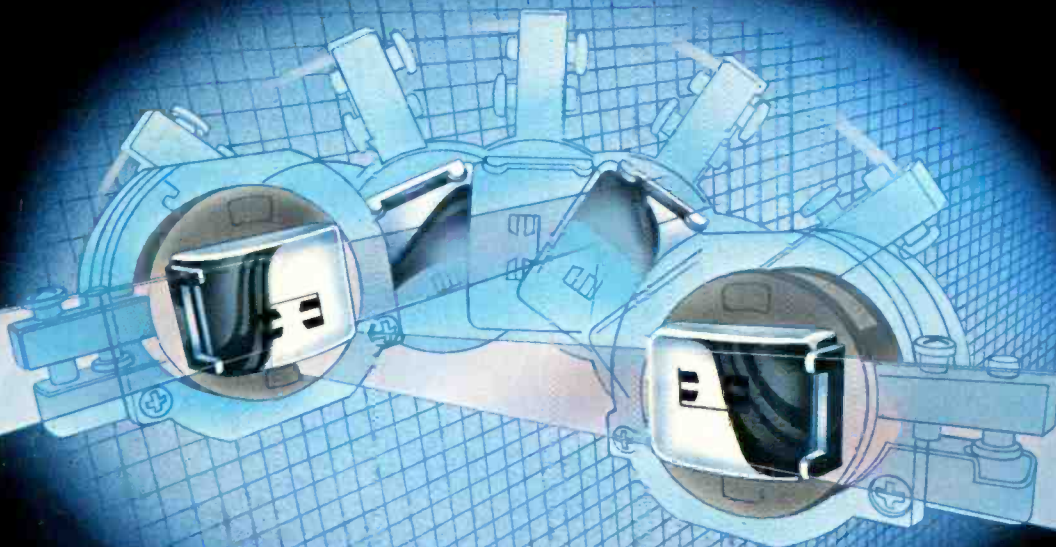
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