AT LAST: STEREO TV!
VHS HI-FI—FIRST LAB TESTS
10 TOP ROCK VIDEOS
EXCLUSIVE REPORT: DBX’S FIRST SPEAKER
(IT’S SUPERB!)
THE QUALITY NEVER FADES.

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BASF Chrome stereo video tapes are compatible with all VHS and Beta Video Recorders.
CED LIVES!

The CBS Records Group says it will continue to make CED video discs along with RCA despite the latter's decision to stop production of CED video disc players. CBS is a leading custom presser of video discs, which it produces at its state-of-the-art facility in Carrollton, Georgia. Support for the CED format is also coming from such companies as Toshiba, Hitachi, and Sears, which plan to continue selling the players.

HOME VIDEO WINS

"Pavarotti," a Las Vegas production starring the famous operatic tenor, is being released on video cassette by U.S.A. Home Video ahead of any scheduled telecast. The show was taped live in March but won't be aired until the summer, giving U.S.A. Home Video a head start in getting the Luciano Pavarotti show to home viewers.

TECH NOTES

Technics has introduced a Compact Disc player changer that can hold and access fifty-one CD's in seconds. It has remote control and costs $1,500.

Watch for RCA to launch a line of audio components to go with their new stereo TV's and hi-fi audio VCR's. RCA's stereo TV's come with multiple connectors for external VCR's, video disc players, and cable decoders, plus stereo audio interconnects for video and audio equipment. They are expected on the market in June or July....

Polk is introducing a bookshelf speaker that utilizes their SDA technology....

Analog record producer Sheffield Labs is taking the digital plunge and releasing eleven Compact Discs.... Motorola has been pushing manufacturers to use their AM stereo system exclusively. The list of Motorola-only companies now includes Sherwood, GM-Delco, Chrysler, Concord, Samsung, Jensen, Marantz, McIntosh, and Pioneer. Toshiba will manufacture and sell the Motorola AM stereo chip in Japan....

Sansui has just introduced a line of receivers and tuners that decode all four AM stereo system broadcasts....

Onkyo has introduced an $800 three-head cassette deck with Dolby B and C, dbx, and Dolby HX Pro....

KLH, now owned by Kyocera, will introduce a new line of speakers this summer.

TAPE FORMULATIONS

Atco's cassette version of the Yes album "90125" introduces a formulation called Magnetite-12, an "extremely high quality" bias I tape produced by Agfa-Gevaert. Magnetite has been used in tape before, but this is the first time such a formulation has been incorporated into a prerecorded tape for the consumer market....

All new cassette releases on A&M, Windham Hill, I.R.S., and Gold Mountain are being duplicated on premium BASF chromium dioxide tape at no increase in price.
Radio Shack’s Remarkable New 3-Way Speaker System

Advanced Leaf Super Tweeter Extends Response to 40,000 Hz!

The Optimus®-400 has a revolutionary tweeter that reproduces high frequencies more accurately than conventional types. It extends frequency response beyond the human hearing range so that response within the audio spectrum is far more linear. “Paper cone” resonances are eliminated. Transient response is improved. The result is musical details that take on a remarkable crispness and vitality. Because of the increased high-frequency content of today's analog recordings, these advancements are especially important. And the Optimus-400 is ready now to reveal the full sonic capabilities of the new digital discs.

What's more, the leaf super tweeter provides extra-wide dispersion for audibly superior stereo imaging. Complementing the leaf tweeter are a 12-inch woofer and a tuned-port enclosure for exceptionally tight, well-defined bass. There's also a 5-inch, high-compliance driver for smooth, natural midrange. The enclosure is hand-finished in genuine oiled walnut veneer and the system is backed by Radio Shack's 5-Year Limited Warranty. Come in and audition the Optimus-400. You'll be impressed with its performance. Only 199.95 each. Use your Radio Shack/CitiLine card!

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AUDIO MEETS VIDEO

STEREO TV—HERE AT LAST
Extending sound beyond the screen adds greatly to the enjoyment of music on television / by Len Feldman

VHS HI-FI: FIRST LAB TESTS
Audio comes out on top in Hirsch-Houck Labs’ tests of the new VHS Hi-Fi video cassette recorders from RCA and Jensen

SYSTEMS
An investment banker’s “screening room” is a first-class combination of home audio with video / by Gordon Sell

TOP MUSIC VIDEOS
Critic Louis Meredith recommends ten rock classics and ten sonic-spectacular movies that are must-haves for the collector

LOOKING AT MUSIC
The best opera and ballet on video tape and video discs / by Chris Albertson

MORE MUSIC
RECORD MAKERS
The latest from Pete Townshend, Gary Glitter, and Luciano Pavarotti, the Royal Opera in L.A., The Hitler Rap at the movies, and more

BEST RECORDINGS OF THE MONTH
Joe Jackson, Lou Reed, Bono’s Mefistofele, and Rachmaninoff’s Second Violin Concerto

COMPONENT COMPATIBILITY
Some components just don’t work together. What trouble spots should you watch for when making hi-fi matches? / by Julian Hirsch

THE COMPACT DISC TAKEOVER
Digital audio technology is changing, and not just in the directions you might think / by David Ranada

THE dbx SOUNDFIELD ONE SPEAKER
The first dbx speaker has fourteen drivers and unbelievable stereo imaging—a special report by Julian Hirsch

AUDIO EQUIPMENT
CAR STEREO
The Audia DTX-1000 stereo tuner/cassette deck proves its mettle in lab tests and on the road / by Julian Hirsch and Chris Greenleaf

EQUIPMENT TEST REPORTS
Hirsch-Houck Labs test the Proton 930 AM/FM receiver, the Denon DR-M44 cassette deck, the Kenwood DP-1100B Compact Disc player, and the Harman Kardon T60 turntable

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REGULARS
EDITORIAL
LETTERS
NEW PRODUCTS
AUDIO Q & A
CLASSICAL MUSIC
POPULAR MUSIC
BASIC REPERTOIRE
THE HIGH END

COVER DESIGN BY SUE LLEWELLYN, PHOTO BY JOCK LEUNG, PHOTO OF PETE TOWNSHEND BY BOB GRUEN/STARFIKE.
by William Livingstone

With mezzo-soprano Joanna Simon

I LOVE L.A.

This country has changed a lot since I was a kid. When I studied geography in grade school, the majority of the population lived east of the Mississippi, there were no active volcanoes in the continental United States, and in Southern California there was a large cultural desert called Los Angeles.

Now, according to the 1980 census, there are more Americans living west of the Mississippi than east of it, Mount St. Helens has proved that our crust is not as tough as we thought it was, and I am told that Los Angeles has replaced New York as the nation's number-one market for books. Furthermore, the art museums in and around Los Angeles are among the richest in the country, and L.A. has a thriving and varied musical life.

After a few years in New York, even transplanted Southern rustics like me get a little smug about being in the center of the artistic universe. New York isn't turning into a has-been city, but it is making us uneasy to see many musical "firsts" now taking place out West in Texas and Southern California.

This summer the English National Opera company is making its American debut in Texas. Then it comes to New York for a stint at the Metropolitan Opera House. The larger British company, the Royal Opera, Covent Garden, will be making its American debut this month in Los Angeles, but it won't be stopping in New York at all!

The Royal Opera's visit is part of an arts festival staged in Los Angeles in conjunction with this summer's Olympic games, and it promises to reach epic proportions. Well known as a launching pad for musical young athletes, Southern California has received insufficient credit for the music and musicians it has produced.

In 1981, Michael Tilson Thomas conducted the L.A. Philharmonic in a Festival of Music Made in Los Angeles. The compositions included works by George Antheil, John Cage, Erich Wolfgang Korngold, George Gershwin, Arnold Schoenberg, and Igor Stravinsky.

A principal guest conductor of the Philharmonic, Thomas grew up in Los Angeles and received his musical training there. The newly designated music director of the orchestra is another home-town boy who made good as an international conductor, André Previn.

Previn will succeed the glamorous Italian maestro Carlo Maria Giulini, and I think it shows considerable maturity on the part of the administrators of the Los Angeles Philharmonic that they can engage a music director who was trained right there in Southern California and began his musical career in the movie industry.

Previn has gone on to conduct the finest orchestras in the world. He is at present the music director of the Pittsburgh Symphony and next year will become music director of the Royal Philharmonic in London. The high quality of his work is documented on more than 150 recordings on various labels.

Southern California has long been a center of the hi-fi industry, and many record companies have their American headquarters in Los Angeles. I'm glad live music is flourishing there as well.

I congratulate Previn and the L.A. Philharmonic on their new relationship, and I send the city best wishes for the success of the Olympic Arts Festival. And if the people of Los Angeles want to turn what was once a cultural desert into the nation's number-one music center, my advice is to go for it.
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IT'S ONLY A CIGARETTE LIKE BANG & OLUFSEN IS ONLY A STEREO.

12 mg. "tar", 1.0 mg. nicotine avg. per cigarette by FTC method.

Great digital debate

After having read the preposterous Con statements in May’s “The Great Digital Debate,” I must conclude that gentlemen like Doug Sax are either getting old enough to have some hearing loss or are afraid of losing their livelihoods to the new Compact Disc technology. Has Mr. Sax ever really listened to a good CD (one of the Telarc releases, for example) on a good system? Or then there’s Anthony Gregory’s 5,512-Hz square wave. None of the music I listen to has any such square-wave content. Is Mr. Gregory accustomed to listening to the unfiltered output of an Apple II’s sound port?

As far as sampling rate is concerned, how many of the gentlemen in question can hear a 10,000-Hz tone, let alone one at 20,000 Hz? I can hear ultrasonic alarm systems, and I find that CD’s clearly reproduce all the necessary (and much of the unnecessary) parts of the sound spectrum. My CD player also reproduces the full and complete dynamic range of the music I’m listening to. No other medium, except perhaps a dbx-encoded tape, can do that. In short, I’ve given up buying “black discs.” I’m tired of warped records, pops, ticks, hisses, inner-groove distortion, and “analog sound.”

EARL ALLEN
Fort Worth, Tex.

Our new look

During the many years that I have subscribed to your fine magazine, I can’t recall a single issue with the visual impact, sparkling format, and editorial excellence of the issue of May 1984. For the past several months I have noticed subtle changes in both the looks and feel of Stereo Review. Now the fruits of your efforts are stunningly obvious. Kudos to your staff and especially to Sue Llewellyn, your new art director. You folks have solidified Stereo Review’s position as the premier publication of its type.

JASON A. BROOKS
Reedsport, Ore.

Juice Newton

Alanna Nash missed the mark on several points in her March review of Juice Newton’s “Dirty Looks” album. First of all, she says that “most of [Newton’s] hits have been safe, pale reworkings of oldies-but-goodies.” But only three hits out of nine have been remakes, and of these three, Angel of the Morning went gold in 1981, when the recording industry was in a major sales slump, and Break It to Me Gently Newton: “pale reworkings”?

Time for XTC

Thank you to Steve Simels for his long-awaited high praise of XTC in his May review of “Mummer.” This band’s songwriting is imaginative enough to cover everything from life as a fly to military attitudes, and their arrangements are hooky yet maintain individuality. “Too smart for the room” is an apt description of why they are a well-kept secret. It would only take one commercially successful song to make newly acquired fans wonder where XTC had been all their lives and to grant them the recognition they deserve.

JOANNE OSSI
Hackensack, N.J.
If noise, hum and distortion turn you off, turn on Sansui's new AU-D77X* integrated amplifier for pure, true sound.

Only Sansui offers a trio of exclusive noise-eliminating innovations.

First, the unique Super Feed-forward DC power amplifier system routes virtually all types of distortion at all frequencies in the power amplifier. Then, DD/DC circuitry, another Sansui breakthrough, produces high speed response and unmeasurable TIM in the predriver stage of the power amp. And finally, Sansui's latest contribution to silent performance, the Ground Free circuit, remarkably reduces Interface Hum Modulation (IHM) distortion in the power supply.

The result is clean, uncluttered music that's virtually free of noise, hum and distortion. (You also get this impeccable performance with Sansui's 130-watt* top-of-the-line AU-D11 II integrated amp.)

One outstanding performer deserves another. The TU-S77X tuner adds a new dimension to the state-of-the-art. Its new FM multiplex decoder improves channel separation and reduces distortion significantly. Also available is the TU-S77AMX tuner which automatically receives and switches to every approved AM stereo broadcast system.

The AU-D77X and TU-S77X make the perfect tuner/amp combination for people who appreciate great technology as much as they enjoy the silence in great sound. Get the "Silent Treatment" at your Sansui audio specialist, or write for literature.

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*AU-D77X—110 watts, 0.0028% THD; AU-D11 II—130 watts, 0.0025% THD.
Minimum RMS, both channels driven into 8 ohms, from 10-20kHz.
CIRCLE NO. 44 ON READER SERVICE CARD
won a Grammy award. Not bad for a couple of "pale reworkings."

Second, Ms. Nash's attempt at humor in regard to the lyrics of Runaway Hearts simply reveals how dense she is. The words mean that some people would rather live shorter, more adventurous lives than longer, more monotonous ones. Hardly a "dumb" sentiment.

About the only point I agree with Ms. Nash on is that she is "the only person in the Northern Hemisphere who doesn't find Juice Newton's voice very interesting."

BILL NELSON
Ithaca, N.Y.

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Met centennial

William Livingstone's appreciation of the Metropolitan Opera's centennial (March "Speaking My Piece") should be applauded except for one error in fact. The "one American among the principal artists" during the first season was not Frank Nash, who was British. It seems to be established that the leading American artist at the Met in 1883-1884 was soprano Alwina Valleria, who was born in Baltimore in 1848. Her roles included the Trovatore Leonora, Philine, Micaela, and Isabella in Roberto il Diavolo.

LOUIS SNYDER
Fairfield, Conn.

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Involved with U2

I would like to commend Mark Peel on his rave review of U2's "Under a Blood Red Sky" in April. I also agree with him that guitarist Dave ("The Edge") Evans gives a performance that is "fiercely rhythmic, clean, and agile." A great record gets you involved and makes you feel like you're at the concert instead of listening to a recording. And U2's record does get you involved.

JEFF LAABS
Northfield, Minn.

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Strauss texts

George Jellinek is, of course, right in noting that other record companies have "for decades" obtained the rights to print translations of the texts of Richard Strauss's Four Last Songs. Their absence in the recent Philips album sung by Jessye Norman (March "Best of the Month") resulted from the discovery by the music's publishers, Boosey & Hawkes, that the rights to three of the texts, the poems by Hermann Hesse, lie with the literary publishers Suhrkamp Verlag of Frankfurt. All requests for reprint/translation permission are now being referred to Suhrkamp, which is taking a hard line and selling only one-shot reprint rights for the original German. As far as I know, we are the first record company to suffer under this new setup.

A. DAVID HOGARTH
Phonogram International
Baarn, The Netherlands

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Amplification

We got a bit carried away last issue in our zeal to chastise some manufacturers of car stereo power amplifiers for their exaggerated power specifications ("SR Tests 19 Car Amplifiers"). The Philips EN2100 is said by the manufacturer to be a "200 watt" amplifier. The "600 watt" rating we ascribed to it actually refers to the unit's power-supply rating, not its output power. We regret the error.

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AKG ACOUSTICS

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Compact Discs, audio or video tapes, records or AM/FM stereo reception, any way you play it you'll hear it better with AKG headphones.

Used by professional audio engineers around the world as recording studio monitors, AKG headphones help to "fine tune" the recordings that you listen to.

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Whether it's one of AKG's lightweight or studio models, there is one designed for you... any way you play it.

... And for the finest stereo phonocartridges, ask your dealer about the AKG Transversal Suspension System.
Maxell introduces the new XL-S audio cassettes, a series of ferric oxide tapes which deliver a level of performance that can capture the sound nuances found on Compact Discs more faithfully than other ferric oxide cassettes on the market.

There are a number of areas where this achievement is apparent.

GREATER DYNAMIC RANGE.

Through a new formulation of our magnetic particles, we were able to reduce the perceived residual AC bias noise level by 1 dB in the critical 2 kHz to 10 kHz mid-frequency range. And simultaneously increase sensitivity and maximum output levels by as much as 2 dB.

As a result, the dynamic range of each tape has been significantly expanded. So you get a better signal to noise ratio and a fuller impact of the dynamic transients exclusively inherent to digital CD recordings.

LOWER DISTORTION.
The newly formulated particles also contribute considerably to XL-S's low output fluctuation, as well as its virtual distortion-free reproduction, especially in the critical mid-range frequencies. This, in turn, accounts for our XL-S tape's enhanced sound clarity.

IMPROVED MAGNETIC PARTICLES.

Our refined particle crystallization process is the basis for all of these accomplishments. Maxell engineers are now able to produce a more compact needle-shaped Epitaxial magnetic particle of extremely high uniformity. This allows us to create a greater ratio of total surface area to unit weight of magnetic particles.

As a result, our XL-S tapes now have the ability to record more information per unit area than ever before.

Which is why Maxell high bias XLII-S and normal bias XL-S are unsurpassed at reproducing the sound qualities found on today's finest recordings. Regardless of whether your frame of reference is analog or digital audio discs.

For technical specifications on the XL-S series, write to: Audiophile File, Maxell Corp. of America, 60 Oxford Drive, Moonachie, New Jersey 07074.
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For well over a decade, Discwasher has provided the music world with superior record care accessories and is most often considered the world leader in record care technology. Why should you settle for less when it comes to caring for your video cassette recorder? Discwasher believes that preventive maintenance is the best advice for keeping your VCR performing at its optimum level. Regular cleaning of the video, audio and sync heads will remove the buildup of loose oxides deposited by the tape onto the various heads and along the tape path. Utilizing a dry, nonabrasive fiber grid, the Discwasher Brand Video Head Cleaner cleans effectively and safely without the use of harmful fluids or abrasive tapes. The Discwasher Brand Video Head Cleaner effectively removes contamination in less than 30 seconds, restoring vivid colors, picture sharpness and clear sounds to your VCR.

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For your free "Guide To Video Care" write to Discwasher.
SONY DECODER FOR STEREO TV

Sony's MLV-1100 is designed to decode stereo TV broadcasts when used with a "stereo ready" Sony TV. Its output goes directly to a pair of stereo speakers or the auxiliary inputs of a stereo receiver. The unit has a built-in stereo amplifier rated at 5 watts per channel. It also has the dbx compandier circuitry necessary for proper noise reduction of stereo TV programs.

There are two pairs of output connectors on the back of the unit as well as a pair of audio input jacks for FM simulcasts. There are sliding controls on the front panel for treble, bass, and balance. A headphone jack is included. The MLV-1100 measures 17 inches wide, 2½ inches high, and 10⅞ inches deep. Price: $199.95. Sony Corp. of America, Dept. SR, Sony Drive, Park Ridge, N.J. 07656.

Circle 120 on reader service card

NAKAMICHI'S TWO-HEAD DECKS

Two new cassette decks from Nakamichi, the BX-100 and the BX-150, have two heads, three-motor transports, and single-capstan drive. They use the Nakamichi laminated-sendust record/play head. Both feature a dual-speed master fader, Dolby B noise reduction, defeatable MPX filter, and a headphone jack. Microprocessors permit switching easily between functions. AUTO REPEAT enables replay of an entire side or a selectable segment between zero on the counter and the end of the tape. The BX-150 also has Dolby C noise reduction, an output-level control, and an LED tape counter.

Wow-and-flutter for both models is given as 0.06 per cent wrms, signal-to-noise ratio as better than 62 dB (with Dolby B). Separation is better than 36 dB, crosstalk better than 60 dB. The decks come in black or silver finishes. Both measure 16⅞ inches wide, 4½ inches high, and 9⅞ inches deep. Weight is 12⅝ pounds. Prices: BX-100, $349; BX-150, $495. Nakamichi USA, Dept. SR, 1101 Colorado Avenue, Santa Monica, Calif. 90401.

Circle 123 on reader service card

LEVINSON PREAMPS MATCH ANY PICKUP

Universal phono stages with user-adjustable gain and input-loading options enable two new preamplifiers from Mark Levinson to match any phono cartridge precisely. No head amps or pre-amplifiers are needed. The ML-12A also has a line-level section with internally selectable gain to match it to other components. It requires a separate power supply, the PLS-124, unless it is used with the Levinson ML-11 power amplifier. Price: $1,370; PLS-124 power supply, $390.

The ML-10A preamplifier (shown) has a built-in power supply. The balance controls work by changing the closed-loop gain of the line-level stage independently for each channel, thereby avoiding the noise and distortion of ordinary balance controls. Levinson gives typical distortion figures for the phono circuit of 0.014 per cent total harmonic distortion and 0.005 percent intermodulation distortion at 6 volts output from 20 to 20,000 Hz with 63 dB of gain. Signal-to-noise ratio is given as typically -72 dB from 20 to 80,000 Hz, referred to an input of 1 millivolt at 1,000 Hz with 63 dB of gain. Price: $2,870. Mark Levinson Audio Systems, Dept. SR, Post Office Box 701, Middletown, Conn. 06457.

Circle 121 on reader service card

CONCORD CAR STEREO HAS LESS FM NOISE

Concord's HPL-520 car stereo cassette player/radio features FNR, a new noise-reduction system for FM that is said to reduce the effects of multipath and other interference with weak signals. FNR can be disengaged if not needed. Six AM and six FM station presets are included, along with LCD displays, auto-scan tuning, and a front/rear fader. The cassette section has Dolby B and C noise reduction, a d.c. servo-controlled drive motor, and playback equalization for metal or chrome tape.

Power output is rated at 12 watts per channel into 4 ohms from 20 to 20,000 Hz with less than 0.8 per cent total harmonic distortion. The unit is only 4⅜ inches deep. Price range: $399 to $449. Concord Electronics, Dept. SR, 6025 Yolanda Avenue, Tarzana, Calif. 91356.

Circle 124 on reader service card

JAMO SPEAKER HAS SUBWOOFER

The PP 2504 tower speaker, the top of Jamo Hi-Fi's new Scan line, is a four-way, bass-reflex system with a built-in subwoofer. The subwoofer section has two 10-inch drivers operating as one in an antiphase (push-pull) configuration. They are mounted facing each other in the lower half of the tower, and the bass frequencies emerge from a slot at the bottom. Claimed advantages of the design are high sensitivity and greater power-handling capability.

The subwoofer drivers in the PP 2504 cross over at 400 Hz to an 8-inch woofer, which crosses at 1,400 Hz to a 5-inch midrange, which crosses at 4,500 Hz to a 1-inch dome tweeter. Tweeter overload is signaled by an LED indicator. The system can handle continuous power of 250 watts (rms) and peaks of 450 watts, rated sensitivity is 92.8 dB sound-pressure level at 1 meter with a 1-watt input. Frequency response is given as 20 to 20,000 Hz, impedance as 8 ohms. The tower measures 42 inches high, 14 inches wide, and 12 inches deep, and it weighs 67 pounds. Price: $879.90 per pair. The Scan line also includes the two-way SL 60 minispeaker ($151.80 per pair) and four other systems ranging upward in size and in price, from $199.90 to $439.90 per pair. Jamo Hi-Fi U.S.A., Inc., Dept. SR, 916 Ash Street, Winnetka, Ill. 60093.

Circle 125 on reader service card
SLIM-LINE TWO-WAY CANTON SPEAKERS

Measuring only 3½ inches deep, Canton's GL 300F two-way loudspeakers can be mounted on or even inside a wall. The 160-millimeter long-throw woofer and 25-mm dome tweeter are vertically aligned, with a crossover frequency of 1,700 Hz. Frequency response is given as 48 to 30,000 Hz, distortion as less than 1.5 per cent. The speakers are recommended for use with amplifiers rated up to 45 watts. The nominal impedance is 4 ohms.

The GL 300F speakers are available in black, white, or walnut finishes. The removable perforated-steel grille matches the cabinet finish. Height is 13¼ inches, width 8¼ inches. Weight is 10 pounds. Price: $375 per pair, including 16-foot connecting cables and wall-mounting fixtures. Canton North America, Inc., Dept. SR, 254 First Avenue North, Minneapolis, Minn. 55401. Circle 125 on reader service card

WOOFER ON TOP IN PAISLEY SPEAKER

The two-way, vented Model 10 speaker system from Canada's Paisley Research has its woofer placed above its recessed tweeter. According to the manufacturer, this unusual configuration gives more accurate phase alignment for improved stereo imaging and clarity. The 8-inch polypropylene bass/midrange driver has layered-cone damping for a smoother frequency response. The 1-inch tweeter has a soft polyester dome.

The system crossover is at 2,200 Hz. Sensitivity is given as 90.7 dB and the nominal impedance as 6 ohms. Frequency response is 35 to 23,000 Hz ±2.5 dB. The Model 10 is recommended for use with amplifiers rated from 15 to 100 watts per channel. The enclosure measures 23 x 14 x 8 inches, and weight is 25½ pounds. The manufacturer recommends that the speakers be placed on 15-inch stands (as shown) so that the woofer is at the optimum height. Price: Model 10 speakers, $359 per pair, stands, $11 per pair. Paisley Research, Dept. SR, 135 Torbay Road, Markham, Ontario, Canada L3R JG7. Circle 126 on reader service card

EQUILIZER IN AUDIOVOX ETR

The AVX-990 electronically tuned receiver/cassette player for cars from Audiovox includes a five-band graphic equalizer. The equalizer offers up to 12 dB boost or cut in bands centered at 60, 250, 1,000, 3,500, and 10,000 Hz. The AM/FM tuner can automatically scan up to twelve preset stations. A back-lit LCD panel indicates time, frequency, or function. The autorverse cassette player has locking fast-forward and rewind controls and a music sensor to locate the next selection. There is a metal/chrome playback-equalization setting. Maximum output power is given as 50 watts. The chassis is 5¾ inches deep. Price: $390. Audiovox Corporation, Dept. SR, 150 Marcus Boulevard, Hauppauge, N.Y. 11788. Circle 127 on reader service card

PROGRAMMABLE TOSHIBA CD PLAYER

The Toshiba XR-Z70 Compact Disc player can be programmed to play up to sixteen tracks in any order. Controls allow scanning in forward or reverse and skipping to the beginning or end of the current track. Displays show the number of the current track and one of three timings: from the start of the disc, from the start of the track, or to the end of the disc. The headphone output level is variable. The player, 16½ inches wide, 3¾ inches high, and 12½ inches deep, has a wireless remote control. Price: $749.95. Toshiba America, Dept. SR, 82 Totowa Road, Wayne, N.J. 07470. Circle 128 on reader service card

SUMO POLARIS CLASS-AB AMPLIFIER

The Sumo Polaris from All American Audio is a Class AB amplifier rated at 100 watts per channel into 8 ohms, 175 watts into 4 ohms, or 300 watts into 2 ohms. It has a power-MOSFET output stage, common-ground output, and claimed total harmonic distortion (THD) of less than 0.1 per cent at rated power into 8 ohms. Rise time is given as 2 microseconds, and signal-to-noise ratio is 100 dB below rated power. Price: $399, rack-mount panel and handles, $80. All American Audio, Inc., Dept. SR, 31316 Via Colinas, Suite 103, Westlake Village, Calif. 91362. Circle 129 on reader service card

LOWER-COST SONY CD PLAYER

Sony's new CDP-200 Compact Disc player has many of the same features as its more expensive CDP-101 at a retail price of only $700. The drawer-loading CDP-200 includes Index Search to locate specific sections within individual tracks. Automatic Music Sensing to find the start of the current, previous, or subsequent track, and Fast Scan to search the disc at increased speed with the program still audible. The player can also repeat either one track or a selected section of a disc. Displays indicate the current track and index number and the elapsed or remaining time. The headphone output level is adjustable. In a brushed-silver finish, the CDP-200 measures 14 inches wide, 3¾ inches high, and 12½ inches deep. Weight is 14 pounds, 9 ounces. Sony Consumer Products, Dept. SR, Sony Drive, Park Ridge, N.J. 07656. Circle 130 on reader service card
Come to Marlboro Country.


Marlboro Red or Longhorn 100's—you get a lot to like.

Kings & 100's: 17 mg "tar," 1.1 mg nicotine av per cigarette, FTC Report Mar '84
**BY LARRY KLEIN**

**NOISE COLORS**

**Q** Would you please explain the difference between white noise and pink noise?

**LOUIS BERKHARDT**
North Bergen, N.J.

The term “white noise” was coined by analogy to white light. Just as white light has an equal mix of all colors in the visible frequency spectrum, white noise has an equal mix of all frequencies in the audible frequency spectrum. Actually, in white noise every frequency is not present simultaneously, but statistically every frequency averages out to having the same energy as every other frequency. (White noise is sometimes referred to as “random” noise since it is produced naturally by the random movements of free electrons in conductors and semiconductors.)

When white noise appears in an audio system—purposely or otherwise—it sounds very hissy because most of its energy falls in the area that the human ear perceives as the high-frequency part of the audio spectrum. (There are many more frequencies—and hence much more energy—between 1,000 and 20,000 Hz than there are between 20 and 1,000 Hz.) Because it is weighted so heavily toward the high-frequency end of the audio spectrum, white noise is less than ideal as a test signal.

The solution: feed the white noise through a shaping network—a specialized tone control, if you will—that attenuates the energy at the same rate that it naturally rises. The result (using the light analogy) is a “warmer”-sounding noise that is balanced more toward the low-frequency “red” end of the spectrum. This so-called “pink noise” sounds warmer than white because its energy is distributed equally by octave rather than by frequency. In other words, there’s as much energy in the lower five octaves, from 20 to 640 Hz, as there is in the upper five octaves, from 640 to 20,480 Hz.

**TONE-ARM FRICTION**

**Q** I’ve been studying turntable specifications and have noticed that, while manufacturers almost always give the numbers for wow-and-flutter and rumble, there is seldom any mention of tone-arm friction. Isn’t such friction important?

**GERALD FENNINGS**
West Allis, Wis.

Yes, tone-arm friction certainly is important. Fortunately—considering how difficult it is to measure precisely—Julian Hirsch reports that it has been negligible on every tone arm Hirsch-Houck Laboratories has tested for many years.

If arm friction is no more than 10 percent of the vertical tracking force, it will not greatly affect performance. That means that even a cartridge tracking at 1 gram should be able to tolerate 100 milligrams of tone-arm pivot friction without being in trouble. Considering that the few turntable manufacturers who do specify friction generally quote figures lower than 20 milligrams, I would consider pivot friction a problem only since solved—at least in high-fidelity turntables.

You can easily check the lateral friction of a pivoted tone arm. Disable its antiskating and set the tracking force to zero. When the arm is floating freely in a balanced condition, blow gently on the side of the headshell. The arm should then drift slowly toward the turntable’s center. If at any point in its drift across the playing surface it seems to drag or slow down suddenly, the pivots may be binding or there may be a problem with excessive friction. If in doubt, check with the tone-arm manufacturer for his suggestions. Incidentally, none of the above applies to radial-tracking tone arms since, with only a couple of exceptions that I’m aware of, they are all driven by some sort of servo-control mechanism that easily overcomes any friction problem.

**DIRTY AMPLIFIER**

**Q** I added two external cooling fans to my 700-watt amplifier. The fans are aimed to blow into the heat sinks of the amplifier. The problem is that the fans also blow dust and dirt onto the heat-sink fans and output-transistor covers. The dirt builds up to such an extent that I find it necessary to take my amplifier apart and clean it four or five times a year. Could this dirt damage the amplifier over time?

**JOHN SEKAN**
Telluride, Colo.

A Dirt can cause damage if it is electrically conductive or thermally insulating. If the accumulation is as thick as you claim, you would probably do well to vacuum clean your amplifier on a regular basis. But do you really need to have the two fans operating all the time? Perhaps in your enthusiasm to prevent heat buildup, you are aggravating the dirt-buildup problem. My rule of thumb (actually, forefinger) is that if heat sinks don’t get too hot to touch comfortably, they don’t need forced-air cooling.

**A.C. SWITCHING**

**Q** I have two accessory components, a time-delay unit and a noise reducer. In both owner’s manuals it states that the units should be connected only to an amplifier’s unswitched a.c. convenience outlet. I understand that to mean that the accessories will then never be turned off. I also have an equalizer connected to the unswitched a.c. outlet on my tape recorder, the a.c. cord of which is plugged into a switched outlet on my amplifier. Does all this affect the signal, and am I doing anything wrong?

**R. W. BIELSKI**
Mt. View, Calif.

A Once you understand the reasons behind them, the manufacturers’ a.c.-outlet recommendations make more sense than is obvious at first.
You bought a high-powered, quality audio system with speakers to match for only one purpose. Total performance. To maximize its potential, you need the ultimate high-bias audio cassette. TDK SA-X.

It's one of our Pro Reference cassettes designed to deliver unmatched performance.

Surpassing all other conventional cassettes in its class, SA-X delivers a level of sound quality, clarity and fidelity that you have never obtained before. Unless, of course, you're already using it.

SA-X's exclusive dual coating of Super Avilyn magnetic particles provides optimum performance at all frequency ranges. You get crisp, clean highs and rich, solid lows. With pure sonic pleasure in between.

SA-X will also handle high signal levels without distortion or saturation, thanks to its super-wide dynamic range and higher MOL.

And we make sure SA-X keeps on tweaking without squeaking (as some other cassettes do). Our specially-engineered Laboratory Standard Mechanism provides a smoother tape transport to assure total reliability and trouble-free performance.

It should also come as no surprise that you'll get incredible performances from two other TDK Pro Reference cassettes: MA-R metal and AD-X Avilyn-based normal bias cassettes. Each is designed to deliver pure performance pleasure and long-time reliability...each backed by our Lifetime Warranty.

So maximize the performance of your equipment. Pick up TDK Pro Reference audio cassettes today. We've never met a speaker we couldn't tweak!
glance. Keep in mind that an a.c. convenience outlet is meant to be just that—a convenience. Consider it merely an a.c. extension cord built into a component—it has nothing to do with the audio signal path.

The original reason for having both switched and unswitched a.c. outlets was simple: some electromechanical components (turntables and tape recorders) might be damaged by being left “in gear” if their power is suddenly switched off during play, so their line cords should be plugged into unswitched outlets. Those components that can conveniently be switched on and off simultaneously with the amplifier are connected to switched outlets.

The advent of transistorized equipment modified this rule somewhat. Tubes have a slow warm-up time that allows circuits more or less to settle down before they start operating. Solid-state devices, however, come on instantly and—if precautions aren’t taken—loud thumps and crackles are likely to be heard as the circuits start to operate before they stabilize. Although some solid-state configurations don’t produce warm-up noises, many components require special built-in circuits to provide turn-on muting. But sometimes a designer of circuitry that is not naturally immune to noise may decide that it’s not worth the trouble and expense to put in a muting circuit—and that, in any case, the equipment is most stable if left on constantly. The manual is then likely to instruct the user to plug the component into an unswitched a.c. outlet. I see nothing wrong with such advice, since most of the components for which it is offered draw no more current than a small night light.

DENTED DOME

Q I accidentally bumped the woofer in my speaker system, and its center dome is now dented. I can’t tell whether this has caused any bass distortion, but will it ultimately result in either the dome or cone cracking?

GARRY SHIRING
Ford City, Pa.

A Unless you’ve damaged the central dome (also called a dust cap) so badly that it physically distorts the adjacent voice coil, I doubt that you will hear any sonic ill effects from the dent. And in regard to its effect on the life of the woofer, I don’t think you have anything to worry about on that score either. Nevertheless, if you would like to try “pulling” the dent out, you can make an appropriate tool out of a large sewing needle. Heat it in a gas flame until it is red hot. This will allow you to bend about ⅛ inch of its tip at a right angle. Force the needle point through the dome in the dented area and pull the dome back into shape as best you can. Finally, seal the needle hole(s) with a spot of Elmer’s white glue applied with your fingertip.

If the damaged dome is metal, the best I can suggest is that you wrap some duct tape around your finger, sticky side out, and try to pull the dent out through the power of adhesion. In any case, since the dented dome is far more likely to offend the eye than the ear, feel free not to do anything about it.

P-MOUNT ADAPTORS

Q Can I buy an adaptor that makes it possible to use a P-mount phono cartridge in a conventional tone arm?

JOHN HICKMAN
Dyersburg, Tenn.

A Yes, but why would you want to? As far as I know, most separately available P-mount cartridges come with adaptors that will fit them into standard tone arms, and at least one company makes an adaptor that plugs into an S-shaped arm with the standard bayonet socket. But P-mount cartridges have no special advantage in conventional arms and may even be at a disadvantage given some of their standardized parameters. And in any case, any worthwhile P-mount cartridge has a conventional-mounting equivalent.
When you seek sophisticated performance in stereo sound, keep your ears open for the stereo sound system components designed, engineered and quality tested by Ford. Specifically for Ford and Lincoln-Mercury products.

Scan the Ford Electronic Stereo and you'll find the high performance features your music demands. Or tune in high performance sound in a full line of Ford Mechanically Tuned Stereos.

Turn up your highs and lows with the Ford Premium Sound Systems featuring separate low-distortion amplifiers with up to 80 watts RMS power and acoustically matched dual cone speakers. And now available for order on 1984 Ford EXP, Escort or Mercury Lynx: a 7-Band Graphic Equalizer and power amplifier that puts you in control of your music all the way from 20Hz to 20KHz.

When it comes to quality sound systems, seek and you shall find. At your Ford and Lincoln-Mercury dealers today.

* Dolby noise reduction. Dolby is a registered trademark of Dolby Laboratories Licensing Corp.

Ford Electrical and Electronics Division
PART of Clarion's new Audia line of high-performance car stereo equipment, the Audia DTX-1000 includes a cassette player and an AM/FM tuner featuring "diversity reception" for improved FM listening quality. The diversity-reception system uses two separately placed antennas—the Audia DTX-1000 has a separate FM-tuner section for each antenna—and fast-acting sensing and switching circuits to select the better signal at any moment. The rapid switching action is imperceptible to the listener, but the system makes it possible to hear satisfactory FM sound in situations where conventional, single-antenna car receivers are unusable. Signal lights on the DTX-1000's front panel indicate which antenna is in use at any time. (A clear plastic window on the antenna, together with a connecting cable to the receiver, is provided for cars without a second installed antenna.)

Besides the usual features you would expect to see on a car tuner/cassette player in the same price range (separate bass and treble controls, five AM and five FM presets, station scanning, tape program search, a digital clock, loudness compensation, Dolby B noise reduction, high/low tape equalization, and a front/rear fader), the DTX-1000 has a few we haven't seen before. One is the Acoustic Compensation Control, a notch filter that attenuates the response around 180 Hz to reduce the effect of typical car-interior resonances. Another is a "Super SASC" circuit that reduces noise on weak FM signals (controlled with the Dolby B button). Still another is a radio/tape switch that permits changing from one source to the other without inserting or ejecting a cassette. The tape player is one-directional, not auto-reverse, so as to avoid, according to Clarion, the compromises in performance found in many autoreverse players.

The Audia DTX-1000 is designed to be used with separate power amplifiers and comes with output cables and adaptors for them. The chassis box dimensions are 7 ⅛ x 2 x 4⅛ inches, and the nosepiece is 4⅛ x 1⅛ inches. Price: $670. Audia by Clarion, Dept. SR, 5500 Rosecrans Avenue, Lawndale, Calif. 90260.

LAB TESTS

Our bench tests of the Audia DTX-1000 were made using only a single antenna input. When the unit was first turned on, its maximum audio output (which is adjustable) was 1.3 volts, but after a period of operation the output clipped asymmetrically at about 0.9 volt. Therefore, we kept the output voltage below the latter point for our measurements.

In the bench tests, the FM tuner section was not particularly sensitive, nor were its distortion, capture ratio, or image rejection as good as we would have expected. But, according to Clarion, the sensitivity and capture-ratio measurements are affected by the operation of the diversity-reception switching circuit, and it was impossible to disengage the circuit to confirm the better specs claimed by the company. The measured frequency response, channel separation, selectivity, and AM rejection were all good, however, and AM frequency response was satisfactory.

Clarion's installation literature refers to a number of FM-tuner features in the Audia DTX-1000 whose effect could not be measured on the bench because of the operation of the diversity-reception tuning system. These include a keyed AGC circuit to eliminate the need for a local/DX switch (used to prevent FM front-end overload) and a signal-attenuated stereo control that blends the channels and reduces high-frequency response at low signal levels or when multipath distortion is detected. The effects of the latter system were not evident in our tests, which showed good stereo performance down to signal levels where noise and distortion became appreciable. The controls and loudness-compensation characteristics were good (the latter boosted both low and high frequencies considerably at reduced volume-control settings).

The 180-Hz filter introduced a notch about 12 dB deep at 210 Hz, but it had little effect on frequencies above 400 or below 100 Hz. Aside from a somewhat fast tape speed, the cassette player's performance was satisfactory. The tape frequency response was very similar for both equalization time constants, although the 70-microsecond response was slightly flatter and extended slightly further above 9,000 Hz.

ROAD TESTS

Three 150-mile round trips from Brooklyn to a recording job in New Haven, Connecticut, gave me a good opportunity to test the Audia DTX-1000's diversity-reception system. Half of the runs were at night and the others at various times of the day, thus giving me a pretty good impression of how the unit works under almost any reception conditions imaginable.

On one of the trips I disconnected the second antenna and confirmed that the system increases actual FM range only a tiny bit. It does, however, make virtually all receivable sig-
almost always get fully listenable antenna, with two antennas I could from 25 to 30 miles away using one antenna, with two antennas I could almost always get fully listenable signals listenable. If I could get stereo at 35 miles. Occasionally I picked up clean stereo from 45 miles away at night, but I usually lost reasonable separation some time before the 40-mile mark. In mono (automatic and nonswitchable with the DTX-1000), the listening range sometimes extended as far as 60 miles, but usually it was slightly less than the 50-mile cutoff I'm used to.

As I drove past the old Brooklyn Navy Yard, invariably a rough place for FM radio, I noticed a few small spatters and one or two "foof-foop" sounds as the tuner tried to keep the signal clean. But I heard almost none of the incredible hash I am used to putting up with in this location. The same held true in most of the other trouble spots in our urban test route. There was never a hint of cross-modulation or signal overload, nor was there either pumping or fading as the tuner adjusted its sensitivity from spot to spot. Only at the Manhattan foot of the Brooklyn Bridge did I ever lose stations, and then only for brief instants. This is Manhattan's poorest signal area, so getting anything at all there was surprising.

Everywhere I was astonished at the constant flicker of the antenna indicator lights as the diversity system kept switching between them for the better signal. Even standing still, the system responds to passing cars, changing atmospheric conditions, and planes overhead. Rural driving well away from trees and buildings also showed a notable decrease in picket-fencing and other rude FM noises. The improvement was startling in places I have long associated with poor reception. There was some interference, of course, but at much lower levels than any non-diversity tuner has been able to provide. The operation of the noise-reduction circuits for FM was noticeable on weak signals and appeared to increase the effect of the high-blend circuitry.

Tape playback was very quiet, steady in pitch, broad in frequency response, and gentle on the tape. A bad stretch of granite-block streets did cause the tape transport to quiver slightly, but in general it was very well behaved. One day my old, old C-120 test cassette will come to grief if I ever feel that I really needed a one-third-octave equalizer. Using the loudness control and the 180-Hz filter together with the bass control enabled me to get results I've never managed with any other car stereo, even those with integral five-band equalizers or bass center-frequency selectors. My sole objection was to the amount of hiss and noise in the treble with the loudness control switched in. I can't say whether this was a peculiarity of our test unit or a characteristic of the design, but the effect was fairly audible even at high music levels.

The Audia DTX-1000 is a logically arrayed, convenient tuner/tape unit. The controls are easy to operate, the display easy to read both day and night, and the styling attractive. When the ignition is off the display is off, making the unit less attractive to thieves. I certainly didn't miss autoreverse because I have always felt better about using a machine's main direction of play. I'll gladly trade an autoreverse deck's convenience for greater reliability and treble performance.

The Audia DTX-1000 is an excellent overall performer, especially if you regularly drive in FM disaster areas as I do. Returning it after the test period was the only regrettable part of the experience! C.G. 

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**Hirsch-Houck Lab Measurements**

| FM mono usable sensitivity (75-ohm input): | 24.7 SFR (4.7 µV) |
| Mono 50-db quieting sensitivity (75-ohm input): | 26 SFR (5.5 µV) |
| Stereo 50-db quieting sensitivity (75-ohm input): | 43.3 SFR (40 µV) |
| Tuner signal-to-noise ratio at 65 dB: | 68 dB |
| Tuner distortion at 65 dB: | 0.7 per cent |
| FM frequency response (at 3-dB limits): | 20 to 16,500 Hz |
| Stereo separation at 100 Hz, 1,000 Hz, and 10,000 Hz: | 30, 30, and 19 dB |
| Capture ratio at 65 dB: | 3.6 dB |
| AM rejection at 65 dB: | 61 dB |
| Alternate-channel selectivity: | 63 dB |
| Adjacent-channel selectivity: | 5.8 dB |
| Image rejection: | 40 dB |
| AM frequency response (at 6-dB limits): | 2.700 Hz |
| Tape-playback frequency response (standard BASF test tapes, at 3-dB limits): | 120-µS EQ—3.5 to 9,000 Hz; 70-µS EQ—3.5 to 13,000 Hz |
| Tape signal-to-noise ratio (referred to 250 nWb/m at 315 Hz): | Unweighted, 54 dB; with Dolby B and CCIR/ARM weighting, 64.5 dB (120-µS EQ) and 66.5 dB (70 µS EQ) |
| Flutter: | ±0.15 per cent CCR-weighted rms |
| Tape speed accuracy: | ±1.6 per cent error at start of tape, ±1.3 per cent at end |
| Fast rewind time for C-60: | 126 seconds |
| Tone-control range: | ±10.5 dB at 100 Hz; +9.5, -11.5 dB at 10,000 Hz |
| Loudness compensation: | At 30-dB volume setting, referred to 1000-Hz output; +0.81 dB at 100 Hz; +9.5 dB at 10,000 Hz |
| Amplifier line output into 1HF load at clipping (measured at 1,000 Hz): | 1.3 volts cold; 0.9 volt warm |

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C. G. Circle 145 on reader service card

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PROTON 930 AM/FM RECEIVER

HIRSCH-HOUCK LABORATORIES

The Proton 930 stereo receiver combines a high-performance FM tuner section designed by Larry Schotz with an amplifier capable of driving load impedances as low as 2 ohms at high power levels without damage or excessive distortion. It is rated to deliver 30 watts per channel into 8 ohms. There is an "anti-clip-circuit" designed to reduce the audible consequences of waveform peak clipping and a BASS EQ circuit to correct for the bass-response limitations of many compact speaker systems. Dimensions are 4 x 16 1/2 x 9 3/4 inches, weight 15 3/4 pounds. Price: $360. Proton Corp., Dept. SR, 737 West Artesia Boulevard, Compton, Calif. 90220.

LAB TESTS

The Proton 930 demonstrated an exceptional output-current capability. Its measured 1,000-Hz output power at clipping was 44 watts into 8 ohms, 63 watts into 4 ohms, and 66 watts into 2 ohms. Its dynamic power output was even more impressive: about 54, 78, and 130 watts into 8, 4, and 2 ohms, respectively. Clearly, this is no ordinary "30-watt" receiver!

Our test unit, an early production sample, lacked a final instruction manual as well as any of the pertinent performance specifications other than rated output. In a way, this made our tests more interesting, since each measurement showed this to be an even more unusual receiver than we could have expected.

The amplifier distortion of the Proton 930 was not only very low, but it remained low over the full audio range and at any power level up to the clipping point. The noise level was exceptionally low, the phono preamplifier overloaded at the same high level of 210 millivolts over the full audio range, the RIAA equalization was highly accurate and unaffected by cartridge inductance, and so on. The amplifier did shut down as we approached the clipping level when driving 2-ohm loads. An audible click and lapse of a few seconds before the amplifier returned to service suggested that there was a thermal protection system in operation.

We were especially interested in the FM-tuner performance in view of the acknowledged talents of its designer and our previous experience with his products. We were not disappointed. The measured sensitivity was high, and the noise level was as low as we would expect to find in any competitively priced receiver or tuner. The distortion in stereo was very low—lower, in fact, than we can recall having previously measured in an FM tuner. In only one respect did the FM tuner's performance disappoint us. Its image rejection was unexpectedly low at 40 dB that we suspect it was only a defect in the early

Features

- Digital tuning (search and step modes)
- Five preset station memories, each usable for one AM and one FM channel
- LED radio signal-strength indicator
- Headphone jack
- Pushbutton control of loudness, tape monitoring for one deck, stereo/mono mode, BASS EQ, two pairs of speaker outputs
- Rear-panel switches for normal or hi speaker load impedance, anti-clipping circuit, MM or MC phono-cartridge
- Two a.c. outlets, one switched
- 75- and 300-ohm FM antenna inputs; hinged, pivoted ferrite AM antenna
- Separate preamp outputs and main amplifier inputs with removable jumpers
- One pair of phono jacks (MM or MC), one pair of line-level video input jacks (audio signal from VCR, CD player, etc.), one tape loop

HIRSCH-HOUCK LAB MEASUREMENTS

Audio Amplifier

1,000-Hz output power at clipping: 44.2 watts into 8 ohms, 63.2 watts into 4 ohms, 66.1 watts into 2 ohms.

Dynamic power output: 53.8 watts into 8 ohms, 78.7 watts into 4 ohms, 130 watts into 2 ohms.

Clipping headroom: 1.68 dB (8 ohms).

Dynamic headroom: 2.53 dB (8 ohms).

Maximum distortion from 20 to 20,000 Hz, 30 watts output: 0.0056 per cent.

Sensitivity (1-watt output): video, 27 mV, phono (MM), 0.42 mV, phono (MC), 0.033 mV.

Signal-to-noise ratio (1 watt): video, 87.5 dB; phono (MM), 83.5 dB; phono (MC), 71.5 dB.

Phono (MM) input overload: 210 mV.

Phono (MM) input impedance: 52,000 ohms, 100 pF.

Phono (MC) input overload: 100 ohms.

Slew factor: greater than 25.

Tone-control range: +8.5, -9.5 dB at 100 Hz; +6.5, -7.5 dB at 10,000 Hz.

FM Tuner Section

Usable sensitivity (mono): 11 dB (2 µV).

50-dB quieting sensitivity: mono, 15 dB (3.1 µV); stereo, 37.8 dB (40 µV).

Stereo threshold: 35 dB (30 µV).

Muting threshold: No muting.

THD + noise at 65 dBf (1,000 µV): mono, 0.18 per cent; stereo, 0.1 per cent.

Signal-to-noise ratio at 65 dBf: mono, 76 dB; stereo, 69 dB.

Capture ratio: 1 dB at 45 dBf (100 µV).

AM rejection: 70 dB at 45 dBf.

Image rejection: 40 dB.

Selectivity: alternate-channel, 96 dB; adjacent-channel, 15.6 dB; 19-KHz pilot-carrier leakage: -72 dB.

Hum (60 Hz): -62 dB.

Stereo channel separation: 21 dB at 30 Hz, 37 dB at 1,000 Hz, 32.5 dB at 10,000 Hz.
production sample that we tested.

The selectivity of the Proton 930 was among the highest we have ever measured: 96 dB for alternate-channel spacing and almost 16 dB for adjacent-channel spacing. This was even more noteworthy in view of the tuner's low distortion, since distortion usually must be traded off for high selectivity.

Capture ratio and AM rejection were both much better than average. The stereo channel separation was more than adequate and quite uniform. The front-panel LED signal-strength indicators were well spaced, coming on unambiguously at input levels ranging from 23 to 72 dBf (when at least three lights are lit, the full tuner performance is realized). Even the AM tuner had a better than average frequency response, flat within 2.5 dB overall from 26 to 3,300 Hz and down 6 dB at 4,000 Hz.

COMMENTS

The Proton 930's anti-clipping circuit causes the waveform to clip more "softly" than is usually the case. Though in theory this is desirable, we are not necessarily convinced of its practical benefits. We prefer to operate an amplifier well below clipping, and the power reserves of the Proton 930 make clipping even less likely than with most receivers of considerably higher continuous-power ratings. But as far as we can tell, the circuit does no harm and has no detectable or measurable effect below the clipping point.

The BASS EQ is a useful feature that complements the bass rolloff of many compact and bookshelf-sized speaker systems. Its 10-dB peak at about 45 Hz and steep infrasonic rolloff below 30 Hz can greatly enhance the low-bass performance of such speakers (see graph). The BASS EQ response can give an actual reduction in audible rumble instead of the increase likely to result from the use of a simple equalizer or tone-control circuit for that purpose. The boost frequency is so low that it has no significant effect on most reproduced sound, including voices. But when the program material calls for it, the BASS EQ gives a welcome solidity to the sound of a typical bookshelf-sized speaker system, though without any boombiness.

The Proton 930 is conspicuously free of most of the gadgetry and glitter of other recent receivers, but it more than makes up for this by its stellar performance. Its relatively high short-term output power and high-current capability make it a much more "powerful" receiver than its 30-watt rating would suggest. The Schotz FM tuner is, in its own way, even more noteworthy than the amplifier section. Assuming that the somewhat low measured image rejection was a peculiarity of our sample and not typical of the design, this receiver easily outperforms anything we have seen at anywhere near its price.

Julian Hirsch

Circle 140 on reader service card
4 out of 5 Sony car stereo owners would go down the same road again.

It seems there is one road that most Sony owners would gladly travel again. The road to a Sony car stereo.

In a recent survey, an overwhelming majority of Sony car stereo owners contacted gave Sony the ultimate testimonial. They said they would be more than willing to buy a Sony again. As one Sony owner, Ronald Dokken of Minneapolis, Minnesota, volunteered, "When there's a car stereo that sounds as good and works as well as a Sony, why would you want another one?"

In fact, most Sony car stereo owners when asked went so far as to say that they would keep their car stereos longer than they’d keep their cars. Or, in the words of Valerie Roussel of New Orleans, Louisiana: "My car was in the shop for a few weeks. I missed my car stereo a lot more than my car." And Mark Share of Tempe, Arizona, added, "I have two cars and two kinds of car stereos. I find myself driving the car with the better sounding one—the Sony."

Which is not at all surprising, considering the fact that Sony car stereos are not just engineered to perform reliably. They are also engineered to deliver brilliant high-fidelity stereo sound. Because they take advantage of the same experience and innovative technology that goes into Sony's home stereos.

So if you’re in the market for a car stereo, it makes sense to go down the same road that 4 out of 5 Sony owners would travel.

Buy the Sony.

*In an independent survey of 200 recent Sony car stereo purchasers who were in warranty cards, 61% said they’d buy a Sony again. © 1984 Sony Copy, of America. Sony is a reg. trademark of the Sony Corp. 3 Sony Dr. Park Ridge, N.J., 07656
KENWOOD DP-1100B CD PLAYER

KENWOOD'S second-generation digital Compact Disc player, the DP-1100B, offers an impressive array of performance and operating features in a low-profile package. It comes with a compact, battery-operated, infrared remote-control unit that not only duplicates the player's extensive front-panel control functions but also has a feature, called M-SCAN, that automatically samples the first 10 seconds of each programmed selection.

Many second-generation CD players have special provisions for improved tracking ability with damaged or defective discs, and the DP-1100B is no exception. Its Optimum Servo Control circuitry is intended to reconcile two conflicting design goals for the servo-tracking system that makes the player's laser beam follow the spiral pattern of recorded information embedded in a Compact Disc. A high-gain servo tracking system is desirable to increase a player's resistance to external vibration and shock. But a high-gain system could also cause a player to be unduly sensitive to minor defects or damage on the discs themselves.

Kenwood's Optimum Servo Control is normally a high-gain system, but internal circuits sense the first signs of a potentially 'untrackable' disc defect and temporarily reduce the servo gain so that the laser does not become 'de-tracked' as the defect passes. Since damages and defects usually extend over several revolutions of a disc, the system also stores the location of the defect, and during the next revolution the servo gain is again lowered at the same point in anticipation of the passing damage.


LAB TESTS

The performance of the Kenwood DP-1100B, like that of every other correctly functioning CD player we have tested, was superb, usually taxing the abilities of our test instruments to their utmost. The only departure from near-ideal audio performance (and it was a trivial one) was a difference in the left- and right-channel output levels of just over 0.5 dB. This could easily have been a characteristic of our test sample alone. Besides, the inherent unbalance in just about any other program source, to say nothing of the rest of a stereo system, is likely to be at least this great.

There was a moderately high phase shift between the outputs of the two channels at the highest audio frequencies, less than a few degrees at 1,000 Hz and increasing to 43 degrees at 10,000 Hz and 75 degrees at 20,000 Hz. This phase shift has no audible significance that we are aware of. It merely suggests that a single digital-to-analog-converter integrated circuit is being switched to supply both channels, an alternative to using a separate converter for each channel.

In our tests, the DP-1100B did a nearly perfect job of tracking the calibrated defects on the Philips TS4A test disc, failing only to track the largest (800-micrometer) black dot painted on the disc's

-- HIRSCH-HOUCK LAB MEASUREMENTS

| Maximum output level: 1.88 volts |
| Headphone output: 8-ohm, 0.18 volt; 600-ohm, 0.9 volts |
| Total harmonic distortion at 1,000 Hz: 0.0011 per cent referred to 0 dB; 0.002 per cent referred to -10 dB; 0.007 per cent referred to -20 dB |
| Intermodulation distortion: 0.003 per cent referred to 0 dB; 0.011 per cent referred to -20 dB |
| Signal-to-noise ratio: 90 dB |
| Channel separation: 108 dB at 1,000 Hz; 73.5 dB at 20,000 Hz |
| Frequency response: +0.4, -0.1 dB from 20 to 20,000 Hz |
| De-emphasis accuracy: -0.04 dB at 1,000 Hz; -0.12 dB at 5,000 Hz; -0.15 dB at 16,000 Hz |
| Cueing time: 5.5 seconds |
| Impact resistance: top, A; side, A; front, A |
| Cueing accuracy: A |
| Defect tracking (figures are size of largest defect successfully tracked): signal-surface damage, 900 micrometers; painted dots, 600 micrometers; simulated fingerprint, pass |

-- FEATURES

- Front-loading, motorized disc drawer
- Optimum Servo Control for greater immunity to disc damage and external vibration or shock
- Cueing by track and index numbers
- M-SCAN controls skip from track to track
- Program audible in fast-forward and fast-reverse modes
- Programmed playback of up to sixteen selections from discs
Perhaps the only piece of home entertainment equipment that can't be controlled by the SX-V90 receiver.

One look at the diagram to the right should convince you that the SX-V90 audio receiver isn't merely an audio receiver.

In fact, it might just be the most revolutionary piece of equipment in the entire home entertainment revolution.

Because it serves as a control center for more pieces of audio and video equipment than any other competitive product of its type.

Through the SX-V90, you can channel two VCRs (of any format), one TV monitor, one regular TV, one video disc, one compact disc, two cassette decks, two turntables, and one video game or one computer.

But not only does the SX-V90 have the best connections in the business, it also has ingenuity. Because as well as reproducing video sourced signals (such as MTV), it creates simulated-stereo imaging from any mono signal (such as regular TV).

In short, it turns your television into a stereo.

As for the quality of the stereo, with its advanced DDD tuner technology, and 125 watts of power per channel minimum (at 8 ohms, from 20-20,000 Hz with no more than 0.005% THD), the SX-V90 ranks at the top of audio receivers.

Which is a very important point.

Because there's no sense in investing in a control center, only to have it sound like it has a built-in popcorn popper.

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CIRCLE NO. 4 ON READER SERVICE CARD
surface. And it was easily the best CD player we have yet tested in terms of immunity to external shock and vibration. Not only did it ignore moderate blows to its external surfaces (any of which would have caused a phono stylus to leave the groove and jump about), but it actually required a strong blow, delivered with genuine effort, to cause a momentary dropout of the program. This is in striking contrast to most of the first-generation CD players we tested last year, which required rather careful handling to avoid such effects. Most CD players, however, are fairly resistant to common feedback effects.

We judge the cueing accuracy of a CD player by how effectively it handles the transition from Track 17 to Track 18 of the Philips TS4 sampler disc. There is no blank space between these two tracks, and the playback goes directly from the end of No. 17 to the vocal beginning of No. 18. Most players detectably clip the first syllable of Track 18, some lose much of the first word, and a very few make the transition perfectly. The DP-1100B was almost perfect, rating an A− in this respect. Sometimes we could detect the loss of what we would guess to be a few milliseconds of Track 18, but on other tests the transition was perfect.

**COMMENT**

The Kenwood DP-1100B was a very easy player to use (although the manual should be read carefully if you want to take full advantage of its many features). The front panel presents a relatively uncluttered and nonformidable appearance, yet the only programming features available on the other players that it lacks are time cueing and phrase repeat.

The remote control worked well, although it should not be too far from the player for most effective use. On the other hand, the range of the infrared system is considerably greater than the ability of most people to read the illuminated legends in the display window of the DP-1100B, without which one often cannot be certain of the operating status of the unit. We were surprised to find that the remote-control unit has an on/off switch, unlike all other similar units we have seen on other equipment.

The headphone output was excellent, more than adequate to drive any medium-impedance headset to a satisfactory listening volume. This feature is often omitted from CD players, but we would consider its inclusion well worth any modest added cost.

The Kenwood DP-1100B combines great programming flexibility with a straightforward, easy-to-use system of operation. A similarly effective compromise between divergent ideals is evidenced by its fine disc-tracking ability combined with outstanding resistance to external shock and vibration. This product is yet another example of the genuine (as opposed to merely cosmetic) improvements available in second-generation CD players.

Julian Hirsch
Circle 141 on reader service card

"... Of course, sir, you understand it will sound different in your home. The bales of peat moss tend to make this a rather 'dead' area. . . ."
You've got what it takes.

Salem Spirit

Share the spirit. Share the refreshment.

Lights: 10 mg. "tar", 0.8 mg. nicotine, King: 17 mg. "tar", 1.3 mg. nicotine, av. per cigarette by FTC method.

DENON, a division of Nippon Columbia, is probably best known to audiophiles in the U.S. for its high-quality turntables and digitally mastered LP's and Compact Discs. The company is very active in the tape field also, as exemplified by the DR-M44 cassette deck. A three-head, dual-capstan model, the DR-M44 includes an automatic tape-optimizing circuit and both Dolby B and Dolby C noise reduction.

A d.c. servomotor directly drives the main capstan. A second servomotor belt-drives the second capstan, which differs slightly from the first in diameter and rotational speed. This design feature isolates the tape as it passes across the heads and thus helps minimize wow and flutter. The separate record and playback heads (mounted in a common case) permit immediate monitoring of the recorded signal and equalizing systems, no other within our recollection permits a user to monitor their effects directly.

The DR-M44's dimensions are 18 1/4 x 4 1/2 x 11 1/4 inches, and it weighs about 14 pounds. There are no microphone inputs. Price: $599.95. Denon America, Inc., Dept. SR, 27 Law Drive, Fairfield, N.J. 07006.

MEASUREMENTS

The playback frequency response of the DR-M44, as measured with our IEC-standard tapes, was very smooth. With the ferric (120-microsecond) test tape it fell within +1.5, -3 dB over the 31.5- to 18,000-Hz calibrated range. With the CrO₂ (70-microsecond) tape, the variation was even smaller: +2, -0 dB. There was no sign of fluctuations in low-frequency response (so-called "head bumps").

HIRSCH-HOUCK LAB MEASUREMENTS

| Fast-forward time (C-60): 92 seconds | Tape used: Denon DX4 (Type I, ferric) |
| Rewind time (C-60): 91 seconds | IEC 0-dB distortion: 0.67 per cent |
| Speed error: +0.5 per cent | Meter indication at 3 per cent |
| Dolby tracking error: +0, -1 dB | third-harmonic distortion: +4.5 dB |
| with Dolby B: -2, -1.5 dB with | Signal-to-noise ratios (in decibels): |
| Dolby C | Unwrd. A-wrd. CCIR/ARM |
| Wow-and-flutter: 0.023 per cent w s; 0.036 per cent DIN | NR off 52.5 57.5 54.9 |
| Line input for indicated 0-dB: 76 mV | Dolby B 58.6 66.0 65.1 |
| Line output at indicated 0-dB: 0.76 volt | Dolby C 61.0 73.3 74.3 |
| Meter indication at IEC-standard 0-dB: +1 dB | Talk used: Denon DXM (Type IV, metal) |
| | IEC 0-dB distortion: 1.1 per cent |
| | Meter indication at 3 per cent third-harmonic distortion: +5.1 dB |
| | Signal-to-noise ratios (in decibels): |
| | Unwrd. A-wrd. CCIR/ARM |
| | NR off 53.8 58.4 55.7 |
| | Dolby B 59.8 66.7 65.9 |
| | Dolby C 62.2 74.4 73.3 |

Features

- Four-digit fluorescent tape counter
- Memory rewind to 0000 on counter
- Selectors for Dolby B, Dolby C, or no noise reduction
- Twelve-segment-per-channel fluorescent peak-reading record-level indicators, -20 to +8 dB
- Playback level control
- External timer-activated record or playback switch
- Pause/record mute switch
- Switchable FM-multiplex filter
- Front-panel headphone jack
- Rear-panel connector for optional remote control

HITEC HOUCK LABORATORIES

DENON DR-M44
CASSETTE DECK

Speed error: +0.5 per cent
Line output at indicated 0-dB: 0.76
Line input for indicated 0-dB: 76
Wow-and-flutter: 0.023 per cent
Tape used: Denon DX4 (Type I, ferric)
IEC 0-dB distortion: 0.67 per cent
Meter indication at 3 per cent third-harmonic distortion: +4.5 dB
Signal-to-noise ratios (in decibels): CCIR/ARM
NR off 52.5 57.5 54.9
Dolby B 58.6 66.0 65.1
Dolby C 61.0 73.3 74.3
Tape used: Denon DXM (Type IV, metal)
IEC 0-dB distortion: 1.1 per cent
Meter indication at 3 per cent third-harmonic distortion: +5.1 dB
Signal-to-noise ratios (in decibels): CCIR/ARM
NR off 53.8 58.4 55.7
Dolby B 59.8 66.7 65.9
Dolby C 62.2 74.4 73.3
Overall record-playback measurements were made using the Denon DX4 (ferric), DX7 (CrO₂-equivalent), and DXM (metal) tapes for which the DR-M44 was factory adjusted. We also checked the deck's performance with a number of more readily available tapes from Maxell, TDK, BASF, and Scotch. The automatic optimizing system was especially useful in this regard, taming an excessive (+6-dB) treble peak we found with Maxell XLI-S and properly increasing (by 2 dB) the tape sensitivity for BASF Pro II Chrome. Scotch XS I and XS II were extremely similar to the corresponding Denon formulations, and TDK SA was so close that the effect of optimizing, though measurable, was inaudible.

Using the Denon tapes, frequency response at the customary -20-dB level measured ±1.5 dB from 40 to 20,000 Hz with all three tape types. Below 40 Hz the response dropped sharply, a characteristic of many cassette decks. The IEC reference level of 0 dB (250 nanowebers/meter) registered +1 on the DR-M44's indicators. At these levels the superior treble storage capacity of the metal tape is evident from the graph. Because Dolby C reduces the normal record treble pre-emphasis, the metal-tape response extended out to 20,000 Hz -3 dB.

The signal-to-noise ratios of the Denon DR-M44 were very good, as were the wow-and-flutter measurements. Tape speed error was about average. Fast-winding times were on the slow side, but not exceptionally so, and the line input and output levels were entirely normal.

**COMMENT**

We found that the DR-M44 did an excellent job playing prerecorded cassettes and in dubbing and playing back material from both LP's and CD's. Wow-and-flutter was notable only for its absence, and with Dolby C hiss was noticeable only against the virtually silent background of a wide-range digital source.

We have had occasion to criticize a number of automatic tape-optimizing systems, but the one in the DR-M44 did its job properly. We were particularly pleased at the ability to make direct comparisons between optimized and factory-set performance—one feature we would like to see widely emulated.

Nor could we fault the human engineering of the deck, except perhaps for its somewhat slow rewind speed. Others might find a single-memory rewind-to-stop insufficient automation, but we did not.

In short, the Denon DR-M44 has the features and performance we like to find in a cassette deck, and we can recommend it without hesitation.

Craig Stark

Circle 142 on reader service card

“I said ‘No’ and I mean ‘No,’ Robert! You are not going to purchase a tuner that has rhodium-plated jacks, and if I hear one more word about Bill Hoffman’s tuner with the rhodium-plated jacks, you can leave the table!”
HARMAN KARDON T60 TURNTABLE

HARMAN KARDON'S Model T60 is a single-play, two-speed, semiautomatic turntable whose heavy (4-pound) die-cast aluminum-alloy platter is belt-driven by a servo-controlled, quartz-locked d.c. motor. Special measures have been taken to reduce the turntable's susceptibility to external vibrations.

The T60's base is made of high-density particle board chosen for its acoustical damping properties. The platter and tone arm are rigidly mounted on a floating subchassis that is suspended as a unit from the base on compliant isolation springs. The center of gravity of the suspended system is located on the center axis of the platter to improve the stability of the subchassis. Four large feet support the base, each one adjustable for leveling the turntable.

The relatively thin rubber mat that covers the platter of the T60 is said to have only a few thousandths of the rebound coefficient of the typical rubber turntable mat. In other words, it forms an acoustically absorptive "dead" layer that minimizes the transmission of vibrations from the platter to the stylus tip. Also assisting in this regard is a 1-pound disc "stabilizer" that comes with the turntable. When placed on the spindle, it presses the disc firmly against the mat.

The tone arm's cueing lever operates with a definite toggle action, remaining either up or down and causing the arm to lift or descend at a fixed rate virtually independent of the rate at which the lever is moved. Lifting the arm from its rest starts the motor. During play, the arm is not coupled to any internal mechanism, but it can be set to lift automatically at the end of play (this also shuts off the motor but does not return the arm to its rest).

Other unusual features of the HK T60 include a three-position cartridge-load capacitance switch and separate 1-meter-long low-capacitance cables for connecting the turntable to an amplifier. The complete unit weighs 20 pounds, counting the disc stabilizer, and measures 171/2 inches wide, 151/4 inches deep, and 53/4 inches high. Price: $440. Harman Kardon, Dept. SR, 240 Crossways Park West, Woodbury, N.Y. 11797.

MEASUREMENTS

We installed a cartridge in the arm of the T60 with the help of a template and tracking-error protractor supplied by Harman Kardon. When adjusted according to the instructions, the tracking-error and stylus-force calibrations are very accurate. The antiskating adjustment, as in most tone arms we have tested, gave optimum correction when set a few tenths of a gram higher than the indicated tracking force. Unlike most other turntables, the T60's antiskating compensation did not cause a significant out-
Casio introduces the 16-pound recording studio.

The Casio KX-101.
Casio's new computerized audio system does more than just double on keyboards. It lets you record your own hits.

For Casio has packed a complete audio entertainment center into 16 portable pounds of state-of-the-art wizardry.

The KX-101 is the only sound system around that gives you an AM/FM stereo radio. Detachable speakers. A cassette player and recorder. A three-channel keyboard. And a mini recording studio.

So you can not only tune into some beautiful music— you can make your own. The 37-key keyboard has monophonic and polyphonic channels that let you record melodies, chords, and accompaniment—then dump them onto a cassette tape for storage.

And the computerized tape recorder's nine different automatic scanning functions allow you to program and play back your tapes in a variety of ways.

Sound too good to be true? Just check out the new Casio KX-101. And discover the lightweight virtuoso that projects the most sound per pound.

CASIO

Where miracles never cease

CIRCLE NO. 58 ON READER SERVICE CARD
ward drift of the arm when the cueing device was used. The 10-gram net effective mass of the tone arm was slightly less than average, and we would describe it as a low-medium-mass arm. With our test cartridge, it resonated at a nearly ideal 8 Hz.

The unweighted rumble of the T60 was among the lowest we have yet encountered, although the relatively high motor speed—compared to that of a direct-drive motor, for example—placed the principal rumble component around 9 Hz. This prevented the ARLL-weighted rumble measurement from being as outstanding as the unweighted measurement. Nevertheless, the ARLL reading of –62 dB was considerably better than most of the measurements we have obtained from other turntables.

Considering the T60's very compliant turntable suspension, which appeared to resonate at a few hertz, the transmission of audio frequencies through the mounting feet was surprisingly high. Although there was no measurable transmission above 100 Hz, the major modes at 10 to 25 Hz and at 45 to 55 Hz were comparable to those we have measured on many conventionally suspended turntables. As usually happens, operating the turntable with its cover raised greatly increased its susceptibility to base-conducted vibration.

**COMMENT**

The Harman Kardon T60 is a very solidly built, smoothly operating record player. If it is placed on a rigid surface, the installtion consideration.

Switchable load capacitance is a good idea, although a few amplifiers also offer this feature, but the control should probably have been located in the rear of the player, since it is an installation adjustment rather than an operating control. Both this and the vernier speed control are nearly flush-mounted knobs meant to be turned with a coin. The operation of the T60 could hardly be simpler, and we found the automatic motor turn-on when the arm is lifted an ideal arrangement. It eliminates the need for a power switch, which we did not miss for an instant. Even when the automatic end-of-play arm lift is activated, the pickup can be cued to the inner grooves of almost any record without triggering the lift mechanism, a felicitous touch not always found on automatic turntables.

All things considered, our experience with the Harman Kardon T60 showed it to be an excellent turntable—easy to set up and use, attractively styled, and reasonably priced. Julian Hirsch

Circle 143 on reader service card
Pickup your life.

Just pick up a pickup from GMC. A truck, you say? Yes, but no ordinary trucks, these. We're talking cream-of-the-crop pickups from GMC, the people who bring you nothing but trucks.

Our little S-15 is as stylish as can be. It offers optional luxuries and civilized amenities you'd expect in a car.

An S-15 is a useful second vehicle to have around. It's available with either 2- or 4-wheel drive. With V-6 power optional. So it will go almost anywhere, off-road or on.

You can equip an S-15 to haul your boats or snowmobiles or other stuff. Or convert to a camper. And be generally helpful.

Look in the Yellow Pages for the GMC truck dealer nearest to you. Buckle yourself into a little fun, a little spirit, a little something you've been missing. Add a little pickup to your life.

For a free copy of GMC's 28-page, "How To Live Comfortably With A Truck," please write to: GMC Truck Merchandising Drawer 30093, Dept. 44D, Lansing, MI 48909.

Official Truck of the XXIIIrd Olympiad Los Angeles 1984

Some GMC trucks are equipped with engines produced by other GM divisions, subsidiaries, or affiliated companies worldwide. See your GMC truck dealer for details.
Reach for a world of flavor.

MERIT

The low-tar cigarette that changed smoking.

IT'S been available in Japan for more than five years, in West Germany for more than three. Now, after lengthy and exhaustive testing, it is finally available in the U.S. "It" is stereo TV—or, as the industry prefers to call it, "multichannel sound for TV."

The difference in terminology reflects the fact that in the United States interest in multichannel sound for TV broadcasts extends beyond just stereo music. There are many areas of the country populated by Spanish-speaking groups, for instance, and having multiple audio channels available for TV also means being able to transmit a second-language soundtrack for network TV programs or being able to broadcast foreign films with soundtracks in both English and the original language.

While the Japanese and German systems give broadcasters the option of either stereo or dual-language mono sound, the system being launched in the U.S. makes provision for high-fidelity stereo audio and a simultaneous second language in lower-fidelity mono.

**GENESIS**

Way back in 1959, when the Federal Communications Commission was considering systems for stereo FM broadcasting, the question of stereo sound for TV was also raised. At that time, however, the consensus was that stereo sound mated with the small-screen pictures of a typical TV set would be distracting and unsatisfying, and further consideration of two-channel sound for TV was dropped.

But since then the viewing and listening public has become familiar with simulcasts (TV for picture, stereo FM radio for sound) of concerts, operas, and other musical fare. We have learned that stereo sound adds to the enjoyment of video concerts even though the sonic image often extends well beyond the TV screen.

**THE CHANGEOVER**

By the late Seventies, strong interest in multichannel TV sound, particularly on the part of broadcasters seeking second-language capability, led to the establishment of a subcommittee of the Electronic Industries Association (EIA) for the purpose of testing and evaluating means of providing it. After nearly five years of intensive effort and many laboratory, broadcast, and listening tests, the committee published two large volumes of data intended to assist representatives of the electronics and broadcasting industries in voting on a single standard for multichannel sound.

It was determined early on that all the proposed transmission systems
would entail an unavoidable and unacceptable increase in noise level from mono to stereo of about 15 dB. While not as bad as the 23-dB or so noise difference between mono and stereo FM radio, this effect was found to result in poor sound quality for listeners in suburban weak-signal areas. Therefore, the search for a transmission or modulation system compatible with present-day mono TV sound was expanded to include tests for audio noise-reduction systems that could maintain high-fidelity audio quality in stereo TV sound.

To avoid altering TV sound for those who would still be listening in mono, it was decided that noise reduction would be applied only to the stereo “difference channel,” not to the mono “sum channel,” which mono listeners would continue to receive as before. Noise reduction, or companding, would also be applied to the second-language channel, or “secondary audio program” (SAP), which has a rather poor signal-to-noise ratio without it.

The winning modulation system was proposed by Zenith, and the chosen companding system came from dbx. Once the industry vote for a single standard system was taken, the results were submitted to the FCC. And at the end of last March, the FCC issued a limited “free-market” decision—saying in effect that any stereo-TV transmission system could be used as long as it was compatible with a specific set of technical parameters. Those parameters match the parameters of the Zenith/dbx system.

Most of the legal impediments having been cleared up by this ruling, both broadcasters and equipment makers have begun gearing up for the arrival of stereo and bilingual TV. The ABC TV network even announced tentative plans (which have since been shelved, we understand) to telecast this summer’s Olympic Games from Los Angeles using stereo and bilingual sound channels.

The coming of stereo TV and bilingual broadcasting will have a profound effect both on the way we use our audio and video equipment and on the types of components we’ll be able to buy in the future. To begin with, you can expect TV/FM simulcasts gradually to disappear. The FCC has tolerated such duplication of audio programming on TV and FM only because until now there was no other way to obtain stereo sound for TV programs.

But the chosen system for stereo/bilingual TV sound in no way makes anyone’s present TV set “obsolete.” The many millions of mono

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**THE TECHNICAL DETAILS OF STEREO TV**

A broadcast television signal is a very complex waveform that has to carry a great deal of information. It can be analyzed as two separate signals mixed together: a video carrier and an audio carrier. Most of the broadcast signal’s energy is in the video carrier, which carries the TV picture and the signals necessary to turn a black-and-white scene into one in full color.

The audio carrier used to be a fairly simple signal, like a mono FM radio broadcast. But in order to transmit stereo sound and bilingual programming, subcarriers have been added. In the stereo TV system developed by Zenith, the modulation of the main audio channel consists of a left-plus-right (L + R) audio signal summing the two stereo audio channels. This makes it compatible with mono TV’s.

The channel-difference audio signal (L − R) causes double-sideband, suppressed-carrier amplitude modulation of a subcarrier at twice the TV horizontal scanning-line rate (which is 1.5734 kHz). The bandwidths of both the sum and difference audio signals extend to 1.5 kHz (as in stereo FM radio broadcasting), and the pre-emphasis of the main signal (L + R) during transmission remains 7.5 microseconds (also as in FM radio). The pre-emphasis of the L − R signal, however, is controlled by the companding noise-reduction system.

The subcarrier for the secondary audio program (SAP) is five times the horizontal line rate, and it is frequency-modulated by an audio signal limited in bandwidth to 10 kHz. The SAP channel’s pre-emphasis is also part of the companding system.

Still another subcarrier is provided for in the Zenith stereo TV system. Known as the “professional subchannel,” this is intended for transmitting data or low-fidelity voice programs. Its frequency is six and a half times the horizontal line rate, and the audio bandwidth is limited to 3.4 kHz.

Finally, to supply a synchronizing signal to the stereo TV decoding circuitry, there is a pilot tone at the horizontal line rate. Its function is similar to that of the 19-kHz pilot tone in stereo FM radio.

**NOISE REDUCTION**

Some sort of audio compression during transmission and equivalent
TV sets currently in use will continue to receive a monophonic signal even when stereo is broadcast, just as you can hear a stereo FM broadcast on a mono radio. Of course, you won’t be able to receive any second-language broadcast on your old TV set unless it is one of the few that are “stereo-ready.” But the companies selling stereo-ready sets (usually using some form of multiplex-output jack) will surely offer adaptors to convert them to full stereo/bilingual operation. (Sony and General Electric have already introduced such devices for their stereo-ready sets.)

If your set isn’t stereo-ready, you can, of course, wait for the introduction of all-in-one stereo TV sets equipped with twin integral or detachable speakers, but that will mean discarding your present TV or moving it to another, secondary viewing location. If you own a good stereo component system, you probably won’t want to convert to stereo TV via an all-in-one set. Rather, taking the same component approach that works so well for high-fidelity audio systems, you will want to integrate stereo TV sound into your existing stereo system and use your present amplifier or receiver and loudspeakers, which are bound to be better than those supplied with almost any television set or monitor.

For some years now, leading manufacturers of video products have offered video components as well as complete television receivers. A video system usually consists of a TV tuner and a separate TV monitor. The TV tuner resembles an audio tuner or receiver. Before long, manufacturers will be offering stereo TV tuners whose audio output jacks can be fed into any unused high-level input (aux, tape, or tuner) on an audio amplifier or receiver.

Such tuners will have the required decoding circuitry built in, and switches will select either stereo audio or bilingual outputs. The more elaborate models may also have video outputs, for feeding a TV monitor, or stereo FM radio outputs. If you already own a good color TV set, though, you may prefer to buy a tuner that provides only the audio signals broadcast with the video. Then you can continue to watch your present set, but with the volume turned all the way down, and listen either to high-quality stereo-TV sound or a secondary audio program through your stereo sound system.

The beginning of stereo TV broadcasting is the most significant step taken yet toward the final integration of audio and video. More than likely, this new service will have as profound an effect on the future of audio in the home as did the coming of stereo FM more than twenty-three years ago. Like the more recent introduction of the digital Compact Disc, stereo TV promises to bring us closer to you-and-there realism in electronic home entertainment.

The spectral- and wideband-compressor loops in dbx’s noise-reduction encoder for stereo TV act to reduce the dynamic range of the transmitted signal.

Special rms detectors control both amplitude and spectral compression in order to minimize sensitivity to interfering impulse noises while maintaining appropriate reaction times for music signals to prevent “pumping” and “breathing.”

A limiter is provided within the dbx TV encoder for preventing transmission-channel overload without introducing compression/expansion tracking errors. A sum-channel filter corrects for phase shifts added by the compressing.
AUDIOPHILES have been "listening" to a lot of video lately. We see more and more audio equipment being hooked up to video systems and more video equipment with fantastic audio performance. The new Jensen AVS-6200 and RCA VKT-550 VHS Hi-Fi video cassette recorders certainly belong in that category.

Until recently the sound quality available from home VCR's was generally poor or worse. A few models had stereo, and some also included Dolby B noise reduction. But 45-dB signal-to-noise ratios, 8-kHz frequency responses, and annoyingly audible wow and flutter barred them from consideration as serious products for the audiophile. About a year and a half ago, Sony announced the development of the Beta Hi-Fi system, with which a Beta-format VCR could record and play sound of exceptional quality with or without an accompanying video program. In general, the Beta Hi-Fi decks have lived up to the claims made for them. Their sound quality nearly matches that of digital audio recording, and it is certainly better than that of the finest analog tape recorders used at home.

Shortly after the introduction of Beta Hi-Fi, JVC responded by announcing the development of VHS Hi-Fi with similar performance specifications. The first VHS Hi-Fi VCR's have reached the market, and we took advantage of the opportunity to test and compare two of them. Our sample of the RCA
VKT-550 ($1,000) was from an early production run. The Jensen AVS-6200 (approximately $1,200) was a preproduction sample said to meet the performance standards of the production models but possibly having minor differences in circuitry and appearance. These two models are at or near the top of their manufacturers’ VCR lines and include all the operating features one would expect in premium video-cassette recorders. The Jensen unit, in keeping with the company’s high-fidelity tradition, has quite a few features designed to appeal to audiophiles as well as videophiles. The key to the high-fidelity VCRs is frequency modulation. Frequency-modulated signals are relatively immune to interfering noises, which is why FM radio can sound as good as it does. Like the Beta Hi-Fi system, VHS Hi-Fi frequency-modulates high-frequency carriers with the two audio signals. Aside from this, however, the two systems have little in common.

HOW IT WORKS

In Beta Hi-Fi, the FM carriers are mixed with the video signal and recorded on the video tape simultaneously through the same set of rotating heads. In the VHS method, the frequency-modulated audio signals are recorded and played back using what JVC calls “depth multiplexing.” Separate audio heads on the rotating video-head drum record the stereo information relatively deep into the tape’s magnetic coating. The video signal is recorded over it on the same portion of the tape, but much closer to the surface of the coating so that it does not completely erase the audio carriers. Crosstalk or interference between the audio and video signals is avoided by using very different azimuth angles for the FM-audio and video recording heads, which makes the upper (video) layer of the recording effectively transparent to the VHS Hi-Fi heads during playback. The audio heads respond only to the FM carriers below the video signal layer.

The basic modulation schemes used in both the Beta Hi-Fi and VHS Hi-Fi formats lead to audio playback with a relatively poor sig-
RCA

FEATURES COMMON TO BOTH RECORDERS

- Wireless infrared remote control
- Unattended timer recording for up to fourteen days (five events for RCA, eight events for Jensen)
- Input for video camera
- Sound recording from TV broadcast, camera, TV/FM simulcast, or any external high-level audio source
- Electronic four-digit index counter (displays time when recorder is off or when switched)
- Twin-slider audio recording-level controls
- Separate peak-reading LED audio-level indicators for each channel (marked from -20 to +8 dB, red above 0 dB)

SPECIAL FEATURES OF RCA VKT-550

- Records and plays back at all three VHS speeds (SP, LP, SLP)
- Peak-hold option on recording-level display
- Remote control has "double speed" mode to speed up picture advance (sound is inaudible in this mode)
- Dimensions: 17 1/8 inches wide, 14 1/2 inches deep, 4 3/4 inches high
- Weight: 22 pounds, 6 ounces

LAB MEASUREMENTS

Our laboratory tests of these machines were limited to their audio performance (principally in the Hi-Fi mode, although we also checked some aspects of their longitudinal-soundtrack performance). For listening comparisons, we dubbed Compact Discs onto both VCR's for A/B comparisons during playback. Their video qualities were judged subjectively, by recording TV broadcasts and viewing the playback pictures.

The frequency response was measured by recording a sweeping sine-wave signal from a CD test disc. This signal was flat within 0.5 dB from 20 to 20,000 Hz. The playback from the VCR was displayed on our UREI automatic plotter, using an expanded amplitude scale. (Note: Our earlier tests of the Beta

input levels, all referred to the "0-dB" LED of the recorder's scale. The A-weighted playback noise level was measured relative to the output from a 0-dB recorded signal at 1,000 Hz. A 3,000-Hz signal was recorded from our flutter meter and the playback signal returned to the meter for measurement. These tests were made at both the standard (fastest) and the slowest speed of each machine. Several types of video cassettes were used, including Maxell HGX, BASF Chrome, and 3M HGX Plus, but no differences between them could be detected. We measured the playback channel separation at 1,000 Hz for the Jensen recorder, but this was not possible with the RCA unit since a signal applied to only one input jack was automatically recorded on both channels (it performed properly with stereo programs, however).

HOW IT SOUNDS

In their audio performance, the similarities of the Jensen and RCA machines were much more striking than their differences. For most purposes, in fact, they could be considered audiibly equivalent. And even the measurable differences would probably not be heard without a direct A/B comparison.

Most of the differences we found would stem from inevitable
sample-to-sample variations as well as the fact that our samples were very early production or preproduction units (which, in our experience, do not perform as well as later full-production units). Besides, because the circuitry and tape transports are so thoroughly standardized, the design of the VHS Hi-Fi system leads us to expect very little audible difference between any two correctly operating VHS Hi-Fi VCR’s.

How good, then, was the audio performance? In a word, excellent. For example, unlike conventional analog audio recorders, the VHS Hi-Fi units are not subject to high-frequency tape saturation, which usually requires the frequency response of a cassette deck to be measured at a -20-dB level. On the VHS Hi-Fi deck, the overall frequency-response curves made at the indicated 0-dB levels were virtually identical to the ones made at -20 dB. And those curves were so flat that they can be displayed as curves only with the expanded-amplitude scale we have adopted for digital CD player measurements—they would appear as straight lines otherwise! (The Jensen unit showed a “bump” of about 1 dB in the 70- to 80-Hz region and a rolloff of low-frequency response when measured at -20 dB. But we’ve been told that the latter effect can be caused by misadjusted VHS Hi-Fi circuits.)

These VHS Hi-Fi machines have a headroom above their marked 0-dB levels of at least 13 dB before waveform distortion becomes appreciable, and even then the distortion does not take the form of the third-harmonic distortion commonly used as the basis for setting the upper limit in analog tape recording. Therefore, we specified the signal-to-noise ratio (S/N) of these machines relative to their 0-dB levels. When defined in this ultraconservative manner, the noise performance of both decks was excellent: 71.5- and 80-dB S/N’s, respectively, for the RCA and Jensen units. Since the distortion does not become significant until the level is considerably higher, one might well be justified in adding 13 dB to these figures, yielding S/N’s of 84.5 and 93 dB—figures that rival those of CD players and digital-audio recorders. The same could be said for the almost unmeasurable—and certainly inaudible—flutter figures (between 0.007 and 0.01 per cent).

Listening tests for noise reduction misbehavior revealed a little noise pumping or breathing when we dubbed a digitally mastered piano recording from a Compact Disc. The effect was no different from what occurs when Beta Hi-Fi decks attempt the same task. Since the audibility of the effect seems to vary with the setting of the tracking control and with the tape speed employed, this might be another result influenced by our test units’ being early samples. You might want to listen carefully for this effect (using

(Continued on page 84)
The idea of a unified audio and video system was very appealing to Malcolm Rutledge, a New England investment banker. "But at heart I'm a tweak," he says. "It seemed almost sacrilegious to play my audio system (Linn Sondek, Dynavector, Kyocera, Revox, and Magnepan) in the same room with a projection TV." So he decided to build what he calls a "screening room."

Rutledge got rid of his floor-standing projection TV and mounted an Inflight Services V Star 4 in the ceiling. The V Star 4 is a $13,000 consumer version of the video projector used on commercial airliners. Also in the system are a Magnavox video-disc player, a Panasonic VCR, and a Jensen AV-1500 audio and video receiver. On the audio side are a Mark Levinson ML-9 preamp and ML-10 power amp, a Sony CDP-200 Compact Disc player, Cabasse Clipper speakers, and a Niles A/V Patch Bay. Most of the system is operable by various remote controls. The walls and cabinetry are finished with seven coats of hand-rubbed lacquer. The color is Money Green.
TOP MUSIC VIDEOS
As little as two years ago, compiling a reasonable Hall of Fame list of home rock videos would have been an iffy proposition. There wasn't much out there, and a lot of it was terrible. This situation has changed with surprising speed, probably thanks to MTV. Right now, in fact, we may be only weeks away from the time when every rock-related film or TV clip ever made will be available for home consumption.

In compiling this admittedly subjective All Time Top Ten, I've used three secondary criteria to narrow the field. First, the programs had to be above-ground commercial releases. Second, when in doubt, I opted for videos whose home versions differ from theater or broadcast versions. And, finally, I tried to maintain some historical perspective. Unless otherwise indicated, all of the following are video tapes available in both the VHS and Beta formats.

1
THE KIDS ARE ALRIGHT
(RCA tape and CED disc).
A love letter from a fan, director Jeff Stein, to a
Left, Roger Daltrey in the early Seventies (photo, Michael Putland/Retna). Inset photos, from top: Sixties Who (Retna); Queen today (Capitol); early Tina Turner, far left (Capitol); early Seventies Mick Jagger (Stephen Morley/Retna).
from the Who. From My Generation to Won't Get Fooled Again, from performances on the TV show Ready Steady Go to the final concert with Keith Moon, this remains the most comprehensive, exhilarating, and affectionate rock documentary of them all, and no band deserved it more. Available in mono on tape, but don't throw away your CED version because RCA's video disc has a spectacular stereo soundtrack.

2 GIMME SHELTER (RCA/Columbia). On tour with the Rolling Stones at their performing peak (Keith Richards was awake most of the time) and culminating with the horrific violence and murder of the Altamont Festival. If rock-and-roll ever produced a Greek tragedy, this is it. Just released on LaserDisc, its first appearance in stereo.

3 QUADROPHENIA (Thorn/EMI). Another Who product, this gritty, kitchen-sink-realist account of growing up Mod in the mid-Sixties is a sort of English Graffiti, with a running musical narration based on Pete Townshend's grand, ambitious follow-up to Tommy. It's still the best dramatic film ever made with rock as a subtext. The dance-hall scenes, featuring Sting of the Police, have more kinetic excitement than a week's worth of MTV. Not yet available in stereo.

4 HARD DAY'S NIGHT (Maljack). Four lovable Liverpool lads frolicking through a black-and-white wonderland while making infectious, affecting rock-and-roll music. Showing the Beatles as all of us remember them (and as they probably never were), this has taken on added poignancy since December 8, 1980. John Lennon couldn't have a nicer memorial.

5 THIS WAS ROCK (Media Home Entertainment). Edited down from two famous drive-in-movie rock concert classics of the Sixties (the TAMI and TNT shows), this is probably the most exciting live video you'll ever see, with a talent roster including nearly everybody who was making music at the time except the Beatles. High points: James Brown's Night Train on one foot and the Stones' game efforts to upstage him. (Continued on page 88)
For the longest time, producers of video software for the home market stayed clear of classical music, but with VCR's going stereo and the release of video discs escalating, that situation is getting better. Naturally, the concentration is on the more visually interesting genres, ballet and opera, although a few symphonic works have also appeared.

The ballet and opera video catalogs offer a varied repertoire, ranging from a British production of *H.M.S. Pinafore* with American game-show host Peter Marshall to a Russian documentary on prima ballerina Maya Plisetskaya. Except for Franco Zeffirelli's *La Traviata*, which I viewed on cassette but which is also available on LaserDisc, all the tapes I considered came from one source, Video Arts International (mono VHS or Beta), and all the discs were from Pioneer.

In making my selections, I focused on the artistic merits of the performances, but I also took into account the audio and video quality, direction, scenic design, and general appearance. I made special allowances only for material of historical value whose artistic strength is simply overpowering. (If you have trouble finding the VAI tapes, write to Video Arts International, Inc., P.O. Box 153, Ansonia Station, New York, N.Y. 10023.)

Maya Plisetskaya as Odette in Tchaikovsky's *Swan Lake*
Tchaikovsky's classic ballet with Plisetskaya in the twin roles of Odette and Odile and with Fadeyechev as a masculine Prince Siegfried. Although forty-seven minutes shorter and less remarkable technically, this performance has a dramatic flair unmatched on the otherwise superb Pioneer LaserDisc version of a 1980 Royal Ballet performance at Covent Garden with Natalia Makarova.

2 CARMEN BALLET (Video Arts International). This seventy-three-minute tape of the legendary Maya Plisetskaya also includes very brief excerpts from Dying Swan, Raymonda, and (with Vladimir Vasiliev) a Bach prelude. But consider these little bonuses attached to an extraordinary full-length performance choreographed by Alberto Alonso to music by Russian composer Rodion Shchedrin after Bizet's opera Carmen. The cinematic treatment is rife with memorable imagery and superb dancing. As in the other Russian ballet films, the production leaves something to be desired technically, but it is an artistic triumph that should not be missed by any lover of dance.

CARMEN BALLET

3 THE TALES OF HOFFMANN (Pioneer LaserDisc). One of the first classical LaserDisc releases, this 1981 Royal Opera House performance of Offenbach's opera remains one of the best. Sir John Gielgud introduces each segment, and Placido Domingo is the poet who gets progressively drunker as he tells three tales of past heartbreaks and thus brings about a fourth. His fanciful stories come wonderfully alive in this fine production, with a splendid supporting cast, including Ileana Cotrubas and Agnes Baltsa, conducted by Colin Davis.

The Mikado (Continued on page 89)
COMPONENT COMPATIBILITY

SOME COMPONENTS WORK WELL TOGETHER, SOME DON'T. WHAT SHOULD YOU WATCH OUT FOR WHEN MAKING HI-FI MATCHES?

BY JULIAN HIRSCH

ONE of the great advantages of building a music system from separate components is that you can select each part with an eye to your own special needs, taste, and budget. But it is also necessary to consider how well the various components will work together in a system.

There are some component combinations that simply will not work very well. They may produce an unsatisfying sound quality or even result in damage to one or more of the components involved. On the other hand, you don't have to worry about every link in the high-fidelity reproduction chain. Compatibility problems arise with only a few of those links, and they can be avoided by following a few guidelines.

CARTRIDGE/TONE ARM

At first glance, you'd think there was nothing to worry about in matching a phono cartridge with a turntable's tone arm. After all, except for P-mount units, every tone arm can accept cartridges whose mounting holes are spaced half an inch apart, and every cartridge has mounting provisions for that spacing. Can it be that we don't have to be concerned with compatibility problems in record players?

Unfortunately, the answer is no. This is one of the crucial match-ups in a hi-fi system, and it requires extreme precision in order to realize the full performance potential of both cartridge and arm.

The first point to consider regarding the compatibility of a given cartridge with a given tone arm is mass. Some tone arms are specifically designed for use with a relatively massive, low-compliance cartridge, and others are intended for use only with very lightweight cartridges. In any case, check these specifications before buying.

A cartridge that is too light can be weighted down to meet a tone arm's minimum requirements, but adding mass to the counterweight to balance a heavy cartridge upsets the tracking-force calibration. In gener-
al, adding any mass to the pickup system is undesirable, so it is better to make a good match in the first place. Regardless of specifications, an inability to balance the arm with the cartridge in place is prima-facie evidence of incompatibility.

Related to the question of tone-arm and cartridge mass is the problem of tone-arm/cartridge resonance. The compliance (springiness) of the cartridge's stylus-holding cantilever assembly will resonate at some low frequency with the combined "moving mass" of the cartridge and tone arm. It is desirable to have this resonance occur around 12 Hz, which is high enough to avoid groove-skipping problems with warped records and low enough to avoid a peak in the low end of the audible range.

You can predict whether you will have problems with tone-arm/cartridge resonance by taking a look at either the recommended tracking-force range of the cartridge or its compliance specification. A lighter tracking force or a higher compliance specification will have problems with tone-arm/cartridge resonance by taking a look at either the recommended tracking-force range of the cartridge or its compliance specification. A lighter tracking force or a higher compliance means that the cartridge should be used in a lighter tone arm. Some tone arms are electronically servo-controlled to eliminate resonance problems, and certain cartridges have attachments that damp out most low-frequency resonance.

Once you have a compatible cartridge and tone arm, you must be careful to install the cartridge correctly. Installing a conventional cartridge is, as I have often noted in these pages, a tedious, exacting, and yet critically important job in setting up a record player. While minor errors are not usually as serious as many people would have you believe, large ones can not only cause substantially increased distortion but also degrade channel separation and stereo imaging.

Technics and now licensed to several other turntable manufacturers, the P-mount system eliminates every cartridge installation and setup adjustment.

**SOURCE/AMPLIFIER**

With any line-level (or high-level) signal source—a tuner, a cassette deck, an equalizer, a Compact Disc player, etc.—the only issue in equipment matching is impedance, and with modern equipment it is very unlikely to be a problem. The object is to have a low-impedance output drive a high-impedance input so as to prevent an undesirable loading of the signal source. All the usual line-level sources have output impedances of a few thousand ohms or less (often only a few hundred ohms), and the line- or high-level input impedance of today's preamplifiers (or the preamplifier inputs of receivers or integrated amplifiers) is rarely less than 47,000 ohms and typically at least 100,000 ohms. A mismatch between source and preamp is theoretically possible, but it is not a practical concern.

Similarly, there is almost no possibility that a preamplifier and a power amplifier of recent vintage will be incompatible. The input sensitivity of power amplifiers is typically on the order of 15 to 50 millivolts for a 1-watt output, and almost any amplifier can be driven to its full output by a signal of no more than about 2 volts. This suggests that a preamplifier needs a maximum output of at least 2 volts and a noise level at least 70 to 80 dB below that in order to drive a power amplifier to its full output without contributing audible noise at normal listening volumes. Just about any name-brand preamplifier available today surpasses these requirements by a healthy margin.

**AMPLIFIER/SPEAKER**

An amplifier's ratings are usually based on the power it can deliver to a pair of 8-ohm resistor loads over the full audio frequency range with less than a specified maximum distortion percentage. That is fine as far as it goes. But real speakers do not seem much like 8-ohm resistors to an amplifier. They are a complex combination of resistance, capacitance, and inductance, and all of these change with frequency and to some extent with signal level.

A speaker's highly variable impedance causes it to draw from the amplifier a current whose amplitude and phase, relative to the amplifier's output voltage, can vary over a wide range even with a constant-amplitude input signal. If the amplifier can deliver the required current at the required voltage without distortion, all will be well. The trouble is, most real amplifiers do not behave this way except under rather narrowly defined conditions, and none of them have infinite current capability.

If the amplifier balks at giving the speaker the amount of current that it requires, the result will be some form of distortion since the waveform of the acoustic output will not match that of the input signal. This departure from ideal conditions may take place at frequencies outside the usual audio range, either below or above it, but that does not mean that its effects go unheard. If the amplifier itself becomes nonlinear because of an overload at some inaudible frequency, it will not be able to do a proper job within the audio band. The results can certainly be heard, and they are not pleasant.

Some amplifiers are more susceptible to this effect (current limiting)
PHONO CARTRIDGE/PREAMP COMPATIBILITY

Among all the signal sources that may be used in a music system, the phono cartridge is the most likely candidate for a preamplifier-interface problem. But even with cartridges these problems tend to be small and easily avoidable with typical high-fidelity products today.

Almost all moving-magnet (MM) cartridges are designed to deliver their rated performance when loaded by a resistance of 47,000 ohms and shunted by a total capacitance (including that of the preamplifier, the tone arm, and the connecting cables) on the order of 100 to 500 picofarads. As a rule, neither of these values is critical, and a resistance of at least 47,000 ohms is a de facto standard in hi-fi preamplifier design these days. The capacitance component of the cartridge load is less easily determined, but with most cartridges the effect of even a large error in capacitive termination will be a relatively minor change in high-frequency response—rarely enough to be audible without some sort of A/B comparison.

A problem that was prevalent a decade ago but rather rare today concerns the RIAA equalization accuracy of the phono preamplifier. Some designs can be affected by the inductance of an MM phono cartridge connected to them. The result is usually a slight alteration (a couple of decibels) of the response above several kilohertz.

More than impedance considerations is involved in the cartridge/amplifier interface. The available maximum signal level must be sufficient to drive the amplifier to its full output—or at least a sufficiently high one. (No great harm will result if your 200-watt amplifier puts out "only" 100 watts when driven by the peak output of your cartridge!) On the other hand, too high a cartridge output level might overdrive the preamplifier and produce distortion.

In the past, some phono cartridges could deliver very high outputs, as much as 50 millivolts or more, when playing high-level passages. The result could be an overload of the preamplifier, even at low listening levels, clipping the waveform before it reached the power amplifier. That problem has been effectively eliminated by the expanded headroom of today's phono preamplifiers. Almost all can handle signal inputs of more than 100 millivolts without clipping. In some amplifiers, increased phono headroom has assumed overkill proportions, reaching 300 or more millivolts, although even a 50-millivolt peak output from any modern cartridge and record is unusual.

There is also a potential compatibility problem at the low end of the amplitude scale. Moving-coil (MC) cartridges have become quite popular in recent years, and most of them develop a rather small output voltage in comparison to MM cartridges. A fraction of a millivolt is typical, and in some cases the output is best expressed in microvolts. Additional gain is needed in the phono preamplifier to raise this signal to the level of an MM cartridge output. Sometimes this gain is built into the preamplifier, or even into an integrated amplifier or receiver, but many people prefer to use an external transformer, "head amplifier," or "pre-preamplifier" between an MC cartridge and a standard MM phono input.

There are also a number of high-output MC cartridges available. Typically, they are able to deliver up to 1 to 2 millivolts from most records. They are designed to interface with a regular preamplifier MM phono input with its 47,000-ohm resistance. It is usually necessary to set the volume control higher than normal when you are using an MC cartridge, but its low resistance is an effective short circuit on the preamplifier's phono input, reducing its noise. The overall system signal-to-noise ratio can be better with an MC cartridge and high volume settings than with an MM cartridge operated at lower settings.
The
COMPACT DISC
TAKEOVER

DIGITAL AUDIO TECHNOLOGY IS CHANGING, AND
NOT JUST IN THE DIRECTIONS YOU MIGHT THINK

BY DAVID RANADA

THE digital-audio Compact Disc system will succeed. Sales of some record companies’ CD’s already exceed those of their equivalent black-disc LP’s (Telarc claims a seven-to-three ratio in favor of its CD’s). Consequently, there seems to be little doubt that the system will fulfill its inventors’ expectations: parity in production with the LP within ten years.

A NEW MEDIUM

Critics of the system, however, claim that it is in its infancy, that further development will have to take place before the technology can be called mature. They are right. Compact Disc technology is brand new, as the ages of information media are measured, and it will undergo vast changes as it develops.

From the start of the combined research and development work on the CD system by Philips and Sony, it has been hoped that the system would eventually supplant all playback-only audio media (specifically LP’s and prerecorded cassettes). With CD player prices starting at $500 and player sizes at least as large as mini-components, there seemed little chance that the CD system would ever get into automobiles, or that there would ever be digital-disc equivalents of Walkman portable players. Until now, that is. When I was in Japan on a recent trip, Sony engineers showed me the future of CD technology and it includes exactly those devices.

SHRUNKEN CIRCUITS

The best way to reduce the size and cost of any stereo component, without sacrificing features or performance, is somehow to reduce the number and size of the parts needed to make it. In this digital age, that
usually means putting as much as possible in one integrated circuit. An IC can perform the functions of thousands of transistors and other electronic components in what is essentially one part. Not only is that part smaller than the components it replaces, it is also more rugged and reliable, it simplifies the design of circuits around it, and—in the long run—it is less expensive.

A ONE-CHIP PLAYER

What Sony has done (and, to judge by the date code stamped on the sample chip I saw, has been doing since early this year) is to integrate a substantial portion of the circuitry needed to run a CD player onto one IC (part No. CX23035). Included on this small chip of silicon are the servo speed control for the disc motor, sync detection for the digital bit stream, the error-correction circuits, time-base correction, and data-interpolation circuits. These functions were formerly performed by three separate IC's and a fair number of discrete components. The older chips themselves were equivalent to about 27,000 discrete transistors.

The new integrated circuit, along with a newly developed miniaturized laser "pickup," allows a substantial reduction in CD player size. The CMOS (complementary metal-oxide semiconductor) process from which the chip is made leads to a substantial reduction in power consumption—which implies, of course, battery-operated players. In fact, the first Sony products that will use this chip are those in which small size and low power consumption are an absolute necessity: car CD players and portable, Walkman-like CD players (for around $500). Both have been demonstrated in laboratory prototype form, and production versions will probably appear in audio stores this fall.

Sony is by no means the only company working to extend CD technology. Matsushita (Technics and Panasonic) is also working on reducing the size and number of CD-player parts. They are developing car and portable players as well as some interesting home units, including a CD changer. Philips and Pioneer, among others, are also known to be developing new CD products for the home and car.

Although the potential audio quality of the CD system is mathematically limited by the present audio-encoding standard, there are other aspects to the CD standard that are only now being exploited. For example, the storage of pictures and text information—along with the music—on a Compact Disc press for playback on a TV or computer-monitor screen was envisioned in the early development work on the CD. That is why the CD bit stream contains as yet unused room for picture and text data (in the form of "subcode symbols"). A standard for encoding text and video-game-like pictures is only now being reached, but soon the liner notes for an album may appear not on paper but on your TV screen or computer monitor.

Such screen-output players are the first stage after car and portable players. Then will come the big move of CD technology into the computer biz: "optical data storage." Work is well along at Technics, Sony, Philips, and other research labs on the storage and distribution of computer data recorded on Compact Discs.

BIG BYTES

A typical home-computer floppy disc can hold about 500 thousand bytes of information (one byte is essentially equivalent in information content to one letter or numeral). Sony's proposed digital-data encoding scheme could preserve as much as 500 million bytes of information on one disc, which is why the technology might become very attractive to the computer industry. Encyclopedias, maps, books, computer data bases, dictionaries, and even magazines may eventually be published on CD's. Several companies recently demonstrated working prototypes of such a system, which Sony calls the CD-ROM (for Compact Disc Read-Only Memory).

MIX AND MATCH

And that's only the beginning. DRAW technology (for Direct Read After Write) permits digital recording on a CD-like substrate. That digital data could turn out to be a digitally encoded audio signal. Even more exciting are developments in "magneto-optical" disc technology. A magneto-optical disc recorder will not only record on a CD-like medium, but it will also permit immediate playback or, unlike a DRAW disc, erasure of the recorded material. With this technology a true CD audio recorder is possible; it would record discs playable on future car CD players and CD personal portables. And magneto-optical storage is just what is needed for computers: a relatively inexpensive, reliable, rugged, and transportable mass-storage medium capable of holding, on a single optical disc, more computer information than the average person will ever use in a lifetime.

If Sony and Philips get their way—and they control CD licensing agreements—all these media (audio CD, CD-ROM, DRAW, and the magneto-optical disc) will be compatible. A fully equipped CD player of the future will be able to record magneto-optical or DRAW discs and to play a CD-ROM into your home computer or an audio CD into a stereo system. The important aspects of disc compatibility (track pitch, disc speeds, laser wavelength and intensity, etc.) will have been standardized.

If you think this is all idle "futurologist" speculation, take a close look at the functions performed by that Sony all-in-one chip. Not one of the functions it performs is specifically limited to audio. Turning a CX23035 chip into a CD player still requires the addition of a digital-to-analog converter and analog output circuitry. The chip's own output is only digital data. Digital data could be anything digitally encoded: audio, text, computer graphics, computer programs, or video signals. Sony and others obviously intend to use this chip (or its relatives or descendents) as the central circuit in a family of CD-related technologies. Yes, the CD age is just beginning, and the technology will prove to be more useful and versatile than we can presently imagine.
THE dbx

SOUNDFIELD ONE

SPEAKER SYSTEM

THE FIRST dbx SPEAKER HAS FOURTEEN DRIVERS
AND ALMOST UNBELIEVABLE STEREO IMAGING
A SPECIAL TEST REPORT BY JULIAN HIRSCH

WIDELY KNOWN for its disc and tape noise-reduction systems and related signal-processing accessories, dbx has now developed its first speaker system, and it is as distinctively different in design and operation as the company's other products. Called the Soundfield One, or SFX-1, the system was designed to provide optimized stereo imaging throughout a listening room, freeing listeners from the usual need to remain in a closely defined area in order to obtain the intended stereo effect.

Each speaker in the Soundfield One system takes the form of a large, free-standing square column—42 inches high and 16 inches on a side. Finished in walnut, each side of the speaker has two drivers mounted in it, a 10-inch acoustic-suspension woofer and a 4-inch midrange, covered by a removable brown grille. On top of the 80-pound column is another removable grille that covers a hexagonal array of six 1/2-inch tweeters. The comprehensive, well-written instruction manual recommends against placing the speakers next to a wall or in corners but says that otherwise they aren't terribly sensitive to room position (with which we would agree).

So that the fourteen (!) drivers in each speaker cabinet will produce the desired radiation pattern, the key to the SFX-1's sound quality, their input signals are individually equalized in phase as well as amplitude. Because of some parallel internal driver connections, each speaker unit requires "only" ten sets of individually corrected signals, which are derived from an unusually complex passive crossover network. This network has also been designed to give a relatively flat and resistive average system impedance of 4.5 ohms (± 1.5) over the entire audio range.

Since the crossover network mainly provides the required phase and amplitude characteristics for each driver, additional equalization is necessary to produce a reasonably uniform overall output throughout the audio range. This equalization is provided by the external control unit, the SFC-1, that comes with the Soundfield One system. Normally connected into the signal path via a tape-monitor loop or between the preamplifier and power amplifier, the SFC-1 permits system response to be tailored to the room or listener.

Measuring 171/2 x 81/2 x 13/4 inches and finished in black with silver trim (optional wood side panels are included), the SFC-1's appearance matches that of other dbx electronic components. But the control options it offers...

—from "The dbx SFX-1" by Julian Hirsch, STEREO REVIEW, July 1984
BACK TO BASICS: THE DESIGN PROCESS

Strange as it may seem, it is rare to find an audio product designed from the start to interact synergistically with properties of the human hearing system. Time-delay systems are one example of the genre, and the dbx SFX-1 speaker system is another. Instead of concentrating on what might be called the engineering trivia of loudspeaker design—driver materials or shape, exotic forms of distortion, and the like—Dr. Mark Davis, psychoacoustician and designer of the SFX-1, had only one basic goal: “the design of a stereophonic loudspeaker system whose radiation pattern has been optimized to maintain constant imaging throughout most of the listening room.”

Note that the traditional audio parameters of high fidelity (frequency response, distortion, etc.) are absent from this goal. Why? Because there were more important things to worry about. “The overall sound quality of a loudspeaker system is primarily mediated by its radiation pattern” was Davis’s fundamental hypothesis. Not only frontal, or “on-axis,” response has to be considered, but all the so-called “off-axis” responses must also be controlled, not simply left to chance once the frontal response has been made flat.

When listening to speakers “you do not hear the drivers, you hear the radiation pattern,” according to Davis. A speaker’s “sound” is a composite of the frontal radiation and what bounces off the walls, ceiling, and floor. Get the psychoacoustics first stepped in. The optimum pattern was determined by an experiment, a controlled listening test on the “psychoacoustics of horizontal localization”—that is, how we hear stereo images. It was found that the ideal pattern is moderately directional, with about a 10-dB difference between the levels in the loudest and softest directions of radiation (Figure 1). What’s truly unusual is that the loudest axis points toward the other speaker.

A stereo image is formed by the ears’ analysis of the comparative arrival times and intensities of the signals from each speaker. When you are standing closer to, say, the left-channel speaker, its sound arrives at your ears before that of the right channel, which would normally collapse the image into the left speaker. To maintain a stereo image between the speakers, the perceived level of the right-channel speaker has to be higher when the listener is standing closer to the left speaker, thus “pulling” the image toward the center. Davis’s radiation pattern trades off differences in sound-arrival time for differences in sound intensity.

The SFC-1 not only equalizes the response of the SFX-1 but also contains unusual control features. 1,000-Hz gain), the SFC-1 includes a fixed infrasoric filter and a unique power-monitor circuit that is connected directly to the speaker terminals on the music system’s amplifier. The power monitor uses dbx’s proprietary rms-level detectors to monitor the levels delivered to the speakers. Intended to protect the drivers against burnout, it has operating time constants comparable to those of the speaker coils. If the time-averaged output of the amplifier comes within 5 dB of the speakers’ safe limits, a yellow warming light on the SFC-1’s front panel comes on. At the absolute maximum limit, a red LED lights and the signal level is slowly reduced (it is gradually restored when the potentially dangerous power levels have ceased).
The most significant feature of the dbx Soundfield One system is not its unusual design or fine measured performance, but how it sounds. Regarding that, let me say first of all that the imaging qualities of this system lived up to the manufacturer’s claims in full measure. With programs that placed perceived sound sources at distinct points between the speakers, it was possible to walk around the room, and even up to the speakers themselves, with little or no apparent change in position or volume of the program components. It was disconcerting, in fact, to find that standing close to the front of one speaker sometimes caused it virtually to disappear sonically, apparently leaving the other speaker to carry the program alone. In general, however, the apparent volume and stereo-stage configuration were practically independent of the listening location. This quality alone would be sufficient to set the SFX-1 apart from conventional speakers—and, in our opinion, above most of those on the market.

VANISHING SPEAKERS

What about the sound quality itself as distinguished from the imaging properties? We soon discovered that listening to the Soundfield One can be very addictive. Once suitable control settings on the SFC-1 have been established, these rather large speakers seem to vanish, leaving the listener gratefully immersed in a sea of music. Almost any complimentary adjective could be applied to the sound of these speakers without undue exaggeration. Still, it must be remembered that the system’s control flexibility permits considerable variation in the overall sound. These speakers can be made to sound just as good (or bad) as the listener prefers—or as the program material itself may merit.

POWERSFUL IMPRESSION

Listening to music on both Compact Discs and dbx-encoded LP records, we were able to put the controller’s power monitor to the test. The red warning LED lighted at approximately the clipping point of our 200-watt amplifier with such dynamic material as Telarc’s CD recording of Stravinsky’s Firebird. The sound reproduction at this high level was superb in its stereo spread and impact, and the speakers withstood this treatment easily. It is apparent that even more powerful amplifiers could be used to advantage with the SFX-1 system since dynamic peaks can far exceed the average power output to the speakers without overheating or damaging the drivers. Together, the twenty-eight drivers in a pair of SFX-1 speakers can safely absorb surprisingly large amounts of power.

(Continued on page 86)
Brita"n's Royal Opera, from Covent Garden in London, will make its first trip to America when it visits Los Angeles this month as part of that city's Olympic Arts Festival. Led by its music director, Sir Colin Davis, the company will present three operas, including its celebrated production of Benjamin Britten's Peter Grimes with Jon Vickers in the title role.

Davis, Vickers, and the company recorded Grimes for Philips Records in 1978. A later performance of the work with the same artists is available in video on Pioneer LaserDisc.

The Royal Opera opens at the Dorothy Chandler Pavilion in Los Angeles on July 9 with a new production of Puccini's Turandot. Gwyneth Jones and Placido Domingo will sing the leading roles. The third opera in the company's repertoire for Domingo will sing the lead-

Also coming from across the Pond for his first American tour is British rocker Gary Glitter. No less an authority than Boy George has described Glitter as "pure entertainment on all levels," proving that chest hair still has a place in rock-and-roll.

Although Glitter has never appeared in the United States before, his records have—most recently as one of Epic's ill-fated ten-inch NuDisks of a few years ago. His early Seventies singles were among the purest pop music ever made by Western man, and they influenced a number of American performers (ask Joan Jett, for instance).

It's a fairly safe bet that Glitter will not be doing any British operas on his American tour. He will be bringing his original back-up, the Glitter Band, and a new album, "The Leader," which contains all eleven of his U.K. chart singles, including Rock and Roll (Parts 1 & 2).

Big Question: Will Gary, who is known for mammoth weight problems, be able to squeeze back into that ridiculous suit?

Guitars for bars? It's not a scene from a rock-and-roll remake of 20,000 Years in Sing Sing, but just Pete Townshend in a pose from his soon-to-be-released Sony Video LP, called simply "Pete Townshend." (They're clever, those Brits.) Originally made for MTV, the tape features seven video clips done to accompany the audio album "All the Best Cowboys Have Chinese Eyes." It will be available in Beta Hi-Fi and VHS stereo.

Also due and noteworthy is a new leasing arrangement with MTV, are excellent Video LP live concerts by Graham Parker and Warren Zevon, and, on a slightly less exalted aesthetic level, sets by Kansas and the Outlaws.

Back in Romania they may have laughed when young Gheorghe Zamfir sat down to play the accordion, but when he switched to the panpipes, or panflute, it became serious business. Now that he is the King of the Panflute, it is very serious business indeed. His international record sales are so big that in ten countries they have won him all of nineteen Platinum and twelve Gold records.

Even in the United States, where Zamfir made his first solo appearances only recently, his record sales have topped 200,000. He appeared at the classiest West Coast halls in the spring, and he will return in the fall to play at the Kennedy Center in Washington and at Avery Fisher Hall at Lincoln Center in New York.

A multimedia performer, Zamfir has taken to U.S. radio and television (including the Merv Griffin Show). He composed the score for John Avildsen's film The Karate Kid, released in June. The soundtrack is a current PolyGram release from which a single is being pulled.

His other recent film credits include the scores for Robert Duvall's Angelo, My Love and Peter Weir's cult picture Picnic at Hanging Rock. Zamfir's panpipes are also featured on the soundtrack for Sergio Leone's Once Upon a Time in America starring Robert de Niro.

Zamfir has not neglected his classical career, however. His latest Philips release (412 221-1) features his own Rhapsodie du printemps and Concerto No. 1, which he performs with the Monte Carlo Orchestra!
Mel Brooks shakes his booty in the brilliant video version of The Hitler Rap, his hilarious dance record “inspired” by his remake of Ernst Lubitsch’s 1942 film To Be or Not to Be. As you may know, MTV has refused to air the five-minute parody (allegedly for “tastelessness,” which is mildly astonishing given the sex-and-violence MTV peddles routinely), but have no fear. Soon you’ll be able to catch the video in movie theaters. In a canny marketing move, 20th Century Fox has decided to re-release To Be with The Hitler Rap as an accompanying short subject (the record, by the way, is still available as an Antilles twelve-inch).

AMERICAN concert music is no longer the wallflower of the arts. Flutist Ransom Wilson’s album of works by Steve Reich, Philip Glass, and Frank Becker, released by Angel Records in 1982, sold well enough that Angel had Wilson back in the studio this year to record more of the same. The new album, “Meet the Minimalists,” is scheduled for September release. It contains Reich’s Eight Lines albums, says, “I feel very good about the renaissance in American composing. For too long it was academic and reached only a few people. The minimalists have something that reaches young people, and it’s exciting to see these composers drawing large, enthusiastic, young audiences.”

It's dance time for Hitler, but not on MTV

Verdi’s Un ballo in maschera. The musicians for the record were members of the Orchestre de la Suisse Romande, but to assure an idiomatic sound the back-up choristers were bussed over the Alps from Italy. Sales of “Mamma” are sure to peak in this country later this summer when Pavarotti appears at major American arenas in New York, Dallas, Chicago, San Francisco, and Los Angeles.

Van Dyke Parks has put together a charming set of twelve songs for his new album, “Jump.” Together the compositions form a song cycle based on Joel Chandler Harris’s classic children’s book, Tales of Uncle Remus. The adventures of Brer Rabbit, Brer Fox, and company may be pretty far out for a pop artist, but Parks has never been exactly conventional. His recent projects have ranged from calypso music (“The Clang of the Yankee Repea- er”) to film scores (“Popeye”). For the

Jump album he adopted a musical-comedy sound. Martin Fyodor Kipper’s lyrics are hopping good fun, and the music is as hummable as anything coming out of Broadway this season. F.R.

The name of Los Angeles-born soprano Arleen Auger is familiar to American classical record collectors because her discography consists of more than one hundred titles. But since she has spent almost all of her singing career to date in Europe, Auger is virtually unknown to concertgoers in her native country. This year she is changing all that, and is shifting her base of operations back to the U.S. Unable to make up her mind between the East and West Coasts, she is still shopping for a new home. But she will be appearing frequently on the American festival circuit this summer and in concert halls from coast to coast next season. Her latest record release is a major one, and it is on an American label. It’s Brahms’s German Requiem conducted by Robert Shaw for Telarc.

The Rolling Stones have settled their nearly decade-old legal dispute with former manager Allen Klein. This clears the way for Klein to release a home-video version of Ladies and Gentlemen, the Rolling Stones, the band’s 1974 live concert film. Unfortunately, the deal doesn’t cover the Stones’ never- aired Rock and Roll Circus TV special.
In 8.5 seconds, Skyhawk will change your mind about Buicks.

Let's face it. Some people think of a Buick as being, well, traditional. But an 8.5 second zero-to-sixty time at our proving grounds is hardly what you would call staid.

This is a Buick? Ah, yes. This is a new Buick Skyhawk T Type. It's smartly outfitted, as you can see. And full of surprises.

It sports an available multi-port fuel-injected, turbocharged 1.8 litre engine that makes it both responsive and practical.

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And high-rate suspension linked with quick steering produces the precise handling you just might not expect from Buick.

Visit a Buick dealer and buckle yourself into a Skyhawk. Then brace yourself for a change of mind. And a pleasant one at that.

Wouldn't you really rather have a Buick?

Some Buick are equipped with engines produced by other GM divisions, subsidiaries or affiliated companies worldwide. See your Buick dealer for details.
JOE JACKSON’S “BODY AND SOUL”: INTELLIGENT ROMANTIC BALLADS THAT LEGITIMIZE NAKED EMOTION

ANYONE without the kind of “New Music” credentials Joe Jackson has would be hooted off to Las Vegas—or, worse, the Grammys—for making music as unapologetically romantic as that on his new “Body and Soul” album. But Jackson’s honesty and intelligence let him get away with it.

Apart from legitimizing naked emotion, Joe Jackson has done another wonderful thing with “Body and Soul”—revived the lost art of liner notes. The ones here were written by the album’s producer, David Kershenbaum, and they are informative and insightful in the tradition of Leonard Feather, Nat Hentoff, and Ralph Gleason. In fact, the entire package—patterned exactly after a Sonny Rollins series on Blue Note records, right down to the duotone cover, liner typography, and thicker-than-average disc insert—has the look and feel of Fifties jazz.

But, except for the larger ensemble used here, which includes muted trumpet and flugelhorn, saxophone, flute, and jazz guitar, the music itself retains the Latin/light-jazz flavor of Jackson’s “Night and Day” and “Mike’s Murder,” with an emphasis on ballads and slow-to-moderate dance tempos.

This is not to suggest that Joe Jackson hasn’t progressed with this album: he has. Lyrically, he’s less cleverly circumspect about the emotional content. It’s right out in the open this time. And “Body and Soul” can claim three of the best things he’s ever done—The Verdict, Loisaida, and Heart of Ice. The Verdict is a song of powerful contrasts—majestic drum and brass fanfares alternate with the hushed tone of Jackson’s piano accompaniment and fragile vocal, all the more affecting because it scrapes against the very top of his range. Loisaida and Heart of Ice are, interestingly, instrumentals. The former is a mournful theme for sax and trumpet, which plumb the deepest lamp-lit sorrows while Jackson’s piano chords flicker above like a starry night. Heart of Ice starts with just a steady rhythm in the high-hat, then adds trumpet and flute, bass, tenor and alto sax, piano, synthesizer and guitar—each combination restating, amplifying, and embellishing the song’s luminous theme. It’s capped with a chorus—sung by Jackson,
Elaine Caswell, and Ellen Foley—that’s so jubilant it’s impossible not to feel better after hearing it.

While Jackson’s muse isn’t always that sharp—Go for It is a good idea awkwardly executed—“Body and Soul” has so much heart you hardly notice. It’s the kind of album that can carry emotions and attach itself to a time, a place, or a feeling like a favorite hat—or an old Sonny Rollins ballad.

Mark Peel

JOE JACKSON: Body and Soul. Joe Jackson (vocals, piano, saxophone); vocal and instrumental accompaniment. The Verdict; Cha Cha Loco; Not Here, Not Now; You Can’t Get What You Want (Till You Know What You Want); Go for It; Lassaidia: Happy Ending; Be My Number Two; Heart of Ice. A&M SP 5000 $8.98, © CS 5000 $8.98; © CD 5000, no list price.

RACHMANINOFF: Piano Concerto No. 2, in C Minor; Rhapsody on a Theme of Paganini. Cecile Licad (piano); Chicago Symphony Orchestra, Claudio Abbado cond. CBS © IM 38672, © IMT 38672; © MK 38672, no list price.

Claudio Abbado and Cecile Licad: warmth, intelligence, and virtuosity

ULTRA LIGHTS, 5 mg. "tar", 0.4 mg. nicotine, FILTER, 9 mg. "tar", 0.7 mg. nicotine, av. per cigarette. FTC Report FEB. '84.

VANTAGE. THE TASTE OF SUCCESS.

Great Taste with Low Tar. That's Success!
the arrangements (the real rather than synthesized strings that creep in at the end of *Endlessly Jealous*), Lou’s brief, witty guitar solos), and the powerful jazz-tinged bass work of Fernando Saunders, and what you have is, if not the best, certainly the most consistent solo album of Reed’s career. As he himself observes in one of the songs, “New Sensations” is rooted in the Fifties, but its heart is right here in 1984. Don’t miss it. *Steve Simels*

**LOU REED: New Sensations.** Lou Reed (vocals, guitars); Peter Wood (keyboards); Fernando Saunders (bass); Fred Maher (drums); other musicians. *I Love You, Suzanne; Endlessly Jealous; Red Joystick; Turn to Me; New Sensations; Doin’ the Things That We Want To; Legend; Fly into the Sun; My Friend George; High in the City; Arcade.* RCA AFL1-4998 $8.98. © AFK1-4998 $8.98.

Ghiaurov: fearsome presence

### DISTINGUISHED CAST IN AN OUTSTANDING DIGITAL MEFISTOFELE

The first digital recording of Boito’s *Mefistofele*, on London, is outstanding, an imposingly captured, consistently well-balanced performance. There is depth as well as richness to the sound, and the wide dynamic range serves this intermittently awkward but frequently exciting opera magnificently. A large share of the credit for the album’s success surely belongs to the veteran conductor Oliviero de Fabritius, who died before this crowning achievement of his recording career could be released.

Nicolai Ghiaurov has long been associated with the formidable title role. While he cannot now sustain the demonic energy of “Son lo spirito che nega” without audible signs of fatigue, he still projects a fearsome presence and dominates all his scenes with a fierce authority. In addition, there is the real luxury of having Mirella Freni and Montserrat Caballé as the opera’s two heroines. Freni sings poignantly and is touching in her realization of Margherita’s tragic predicament. The dramatic requirements of Caballé’s role are not great, but the vocal ones could hardly be fulfilled more lusciously. Luciano Pavarotti’s singing as Faust cannot be seriously faulted, and he is absolutely melting in the Garden Scene. But he shows a growing tendency to overinfect his much-acclaimed tones, to phrase with a certain self-conscious artiness. All the supporting singers are fine, especially the remarkable Piero de Palma as Wagner, the same role he sang in London’s first recording of *Mefistofele* (withdrawn, alas) some twenty-five years ago. The choral tone and precision are good, though the pronunciation could use more definition at times, and Julian Budden’s notes are a mine of pertinent information.

*George Jellinek*

**BOITO: Mefistofele.** Nicolai Ghiaurov (bass). Mefistofele; Luciano Pavarotti (tenor), Faust; Mirella Freni (soprano), Margherita; Montserrat Caballé (soprano), Elena; Piero de Palma (tenor), Wagner; others. London Opera Chorus; National Philharmonic Orchestra. Oliviero de Fabritius cond. LONDON © LDR 73010 three discs $32.94. © LDRS 73010 two cassettes $32.94. © 410 175-2 three discs. no list price.

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**NEW ON CD**

Recent releases of previously recommended recordings

**POPULAR**

- Christine McVie, WARNER BROS. 25059-2. “Sterling music, a rare achievement.” (May 1984)

**CLASSICAL**

HIGH TECH FORUM was created so that you and the manufacturers could share the ideas, concepts and philosophies behind their most advanced products.

In HIGH TECH FORUM you'll get in on behind-the-scenes manufacturing processes that make for a superior audio component or line of components. Learn from company engineers how they achieved the desired sonic quality. In short, learn what makes these products meet your high standards of music reproduction.
Test Bench vs Real World: The Difference Can Be Heard

Considering the many different design concepts and technologies available, choosing an audio component can be a complicated matter. Manufacturers attempt to ease the task by providing performance specifications on their various models. The implication is that by simply comparing the specifications of a number of components, an audiophile can choose the desired caliber of performance in a given price range.

While specifications can reveal something of a particular product's technical capabilities, they may not accurately reflect that unit's performance in an actual use situation. Our test bench photo shows a component surrounded by testing equipment—and it clearly illustrates the difference between a laboratory and a music listening room.

Onkyo products have long reflected leadership in innovative technological design coupled with precision manufacture. Our design approach embodies our concern with both the laboratory and the actual listening environment, and our components possess technical virtues that are clearly audible. Here are just a few examples of Onkyo's technological/musical approach to the problems of sonic fidelity.

**AMPLIFIERS FOR MUSIC.**

Our two proprietary amplifier circuits—Delta Power Supply and Dual Super Servo—provide outstanding performance because they were designed based on an understanding of what actually occurs in a listening environment, when musical signals and not test tones are the program source. Conventional amplifier power supplies use bridge rectifiers. Unfortunately, the 120 Hz ripple voltage in the bridge output produces modulation noise in music signals that are near or at the same frequency. This limits the dynamic range of the amplifier and causes bass "smear." The Onkyo Delta Power Supply incorporates a special rectifier topology that provides clean DC and prevents any intermodulation effects.

Super Servo circuitry, found in Onkyo's power amplifier sections, provides a special feedback loop that operates from 5 Hz down to 0 Hz (DC). This loop eliminates unwanted DC offsets and spurious infrasonic AC components while maintaining the benefits of direct-coupled amplifier performance. The audible result is deep, taut bass reproduction, with rock-steady stereo imaging.

**CASSETTE DECK MOTORS AND SOLENOIDS.**

In ordinary cassette decks, the tape transport section is operated by a single motor. This motor drives the capstan that moves the tape past the heads, and in addition, drives the tape supply and take-up hubs. This can present a problem as it is impossible to optimize a one-motor mechanism for a multiplicity of tasks. The problems are alleviated somewhat by adding a second motor. One motor serves the capstan, and the other drives the cassette hubs during play and fast wind. Three-motor designs usually provide a motor for the capstan and separate motors for each cassette hub. This provides good tape speed stability plus fast wind and rewind times.

However, with most three-motor transports, solenoids are used to reposition the tape head block assembly when switching from play/record to fast wind or off. Solenoids are moving-core electromagnets that are fast and abrupt in their action, and the normal repeated repositioning of the head block can easily shock it out of alignment. The azimuth alignment of the tape head to the tape is extremely critical, in that a fraction of a degree of misalignment causes severe high frequency loss, and Dolby mistracking.

Onkyo's approach to maintaining head alignment is a special three-motor transport configuration: one motor drives the capstan, a second motor drives the take-up and supply hubs, and a third dedicated motor and gear-reduction assembly provides smoothly controlled, shock-free positioning of the head block. This ensures stable long-term azimuth alignment and maximum tape fidelity.

**COMPUTER-ASSISTED FM.**

Our new Automatic Precision Reception (APR) system takes the guesswork out of FM tuning with microcomputer controlled automatic circuit optimization. As each new station is tuned in, critical tuner parameters are adjusted automatically to the actual demands of the signal being received, thus ensuring maximum fidelity, even under poor reception conditions.

**TURNTABLE ISOLATION.**

A phono cartridge is designed to be an extremely sensitive vibration transducer. Unfortunately, the stylus also responds to whatever non-musical vibrations impinge on it, such as turntable rumble and external shock and vibration. The result can be a constant low-frequency background noise, a blurring or ringing quality in the sound—or even a loud howling if the volume or bass controls are turned up too high.

The techniques for dealing with turntable rumble are well known, and Onkyo has applied them in full measure. However, the problems of external shock and vibration have not been addressed successfully by most turntable manufacturers. Onkyo developed a three-step turntable decoupling system that thoroughly isolates the playing mechanism from unwanted acoustical and mechanical interference. The Onkyo Triple Stage Isolation system provides a greater degree of protection from external vibrations, including acoustic feedback, and thereby provides cleaner sound with wider dynamic range.

These design concepts, developed by Onkyo, provide maximum audio fidelity in the actual listening environment, in addition to superb test bench specifications. Your Onkyo dealer can show you how our advanced engineering can provide an incredible listening experience and demonstrate why, Nobody Knows More About Audio Than Onkyo.
Introducing Maxell XL-S Cassettes—Two Paths to Recording Perfection

Many recording engineers believe the single most important element in accurate sound reproduction is dynamic range. And that area, above all, is where Maxell's new XLI-S and XLII-S cassettes are overachievers. The truth of the experts' belief can be heard: When a cassette can capture and play back the dynamics of an original performance, you do hear the difference. And the improvement in quality is astounding.

As technical support for the improved dynamic range, we've also provided higher sensitivity, higher output levels, greater signal-to-noise ratios, and greatly reduced distortion, and then housed that tape in cassette shells made to tolerances five times stricter than industry standards. The result is Maxell XLI-S and XLII-S Audio Cassettes—clear superiority at the leading edge of recording technology.

IMPROVED MAGNETIC PARTICLES.

A unique new High Epitaxial particle is the basis for the unexcelled performance of the XL-Series. Maxell engineers literally grow these two-layer particles under tightly controlled conditions that enable them to consistently meet a variety of special requirements. Because they are ultra-fine in size, and completely uniform in shape, the particles can be packed smoothly onto the tape in unprecedented density. That, in turn, translates into higher output and greater sensitivity at high frequencies, with lower noise.

On playback, output will be higher, yet with lower distortion and noise.

ADVANCED BINDER TECHNOLOGY.

Maxell has long understood that creating a superior magnetic particle is only one step in the process of making a superior recording tape. Equally important are the methods used to apply and fix that oxide onto the tape's base film. Maxell engineers created an entirely new binder technology for XL-S, the Molecular Fusion system that offers several important advantages. For one, the high polymer resin that's used is self-curing. This eliminates the need for adhesive-type binders—and the plasticizer oozing that often accompanies them. The oxide-to-base bond is stronger, more durable, and more uniform, thus providing significant improvements in the uniformity of packing density, thickness, and dispersion. The result is a flatter tape—from one end to the other—and a tape with dramatically reduced modulation noise.

NEW HOUSINGS.

Because the cassette housing becomes part of the tape transport system, Maxell has always focused special attention on this aspect of their products. The new PA (Phase Accurate) mechanism is part of every XL-S and XLII-S cassette. PA includes refinements such as anti-curling hubs, onto which the tape is secured by an exclusive Quin-Lok clamp assembly. This eliminates bumps in the tape pack as the tape winds, and thereby prevents loss of head contact during play or recording. Special smoothing guide rollers hold the tape tension in balance and suppress vibration during use. The tape pack is sandwiched between specially embossed slip sheets, compounded with graphite, to reduce friction during play and fast winds and ensure neat, smooth packing. And a new type of pressure pad has been devised for the PA mechanism. The pad thickness and the tension of the phosphor bronze spring to which it is affixed have been made twice as accurate as those in conventional cassettes.

THE RIGHT TAPE FOR THE RIGHT SETTING.

XLI-S is suitable for use in just about any cassette deck ever made. It has been designed to work optimally at the Normal bias and equalization standard, yet to tolerate the small differences in bias and equalization that occur from one deck manufacturer to another.

XLII-S should be used in the High (Chrome) bias and equalization switch positions. That yields an improved signal-to-noise ratio plus the wide frequency response, and other fine performance characteristics inherent in both XL-S cassettes. Since the beginning of cassette recording, Maxell has been in the business of creating excellence. The XL-S cassettes continue in that tradition.

IT'S WORTH IT.

Maxell Corporation of America
60 Oxford Drive, Moonachie, NJ 07074
CIRCLE NO. 3 ON READER SERVICE CARD
For Superior Car Stereo Performance—
Dynamically Equalized/
Bi-amplified/Powered Speakers

Most researchers would agree that the amplifier-to-speaker match is one of the most problematic—if little discussed—areas in audio. For an engineer, there are at least four compelling theoretical reasons for integrating the speaker and amplifier into a single unit:

1. The output circuit of the amplifier can be specifically matched to the impedance characteristic of the driver.
2. The damping factor of the amplifier can be set to provide the optimum "Q" at resonance for a given driver.
3. The amplifier can be designed to dynamically control the normal electro-acoustic and mechanical characteristics of the driver to flatten its frequency response and to prevent overdrive distortion—or damage.
4. The usual crossover network in series with the driver is no longer necessary. This eliminates the losses of damping factor and dynamics typical of conventional crossovers.

And when a powered speaker is also bi-amplified, there are at least four additional significant advantages:

1. The dynamic characteristic of the individual amplifiers can be tailored for optimum match (in respect to crossover frequency, relative level, etc.) to the needs of each driver.
2. Intermodulation distortion effects are eliminated by separate dedicated amplifiers for the high and low bands.
3. Momentary overdrive of either amplifier leaves the other amplifier and its frequency band unaffected.
4. The specific power demands of each driver are met separately.

**THEORY INTO PRACTICE.**

Audiovox, a 19-year-old autosound company totally invested in state-of-the-art technology, made their own engineering analysis of the advantages of bi-amplified, powered, and dynamically equalized speakers. And their full commitment to the concept is expressed in the line of "Constant Velocity" car-stereo speakers introduced early this year. There are four drivers currently available in the CV series: a 6 x 9-inch woofer (Model SW1), a 6 x 9-inch two-way coaxial (Model 620), a 5¼-inch two-way coaxial (Model 520), and a 4-inch single-cone full range (Model 410).

**DYNAMIC EQUALIZATION.**

The fact of built-in amplification does not in itself explain the quality of sound of the CV speakers. By treating the amplifier and speaker as a single integral system, it is possible to design in dynamic equalization circuits to automatically compensate for non-linearities in the speaker, the acoustic environment of the car, and the human ear's loudness response. The functions are provided on an automatic and dynamic basis with more precision than can be achieved through manual adjustments.

To compensate for the tremendous variety in automobile interiors—and speaker mounting—and the effect these can have on high-frequency absorption, detented tweeter-level controls are provided for the CV-520 and the CV-620. The CV-SW1 subwoofer has a similar control to set its relative output level. These controls, when set at the time of installation, need no further adjustment.

**CONTROLLED EXCURSION.**

The Constant Velocity design's special breakthrough is in the manner in which its circuits control speaker cone motion. Standard designs have always been compromised in performance by the constraints placed upon the cone movement by the typical tight cone suspension. Without such restrictions, the cone would be free to move easily in direct compliance with the input signal, thus providing greater efficiency and wider frequency range. But the cost of such "freedom" would be increased potential for distortion through non-linearity and "bottoming-out" of the voice coil.

These and similar problems are avoided in the CV speakers because the voice coil behavior is under electronic, rather than purely mechanical, control. This assures that the response is full and perfectly defined at all volume levels. It is virtually impossible for the specially designed polypropylene-coated woofer cone to break up or bottom out. The ferrofluid-treated cone tweeters used on the CV-520 and CV-620 reproduce the higher frequencies with clarity and in perfect balance with the woofer.

In total, the Audiovox CV series clearly represent a substantial step forward in the theory and performance of car-stereo speaker design. Prove it to yourself at your nearest Audiovox dealer.
When TDK Electronics was founded in 1935 to explore the commercial potential of industrial ferrite magnetic materials, little did its engineering team realize that its strength and leadership in that field would lead it nearly fifty years later to become the number one manufacturer of quality magnetic media. In fact, almost 60 percent of today's audio hard-turer of quality magnetic media. In fact, almost 60 percent of today's audio hard.

**AVILYN MOVES AHEAD**

Back in the early 1970's, TDK stepped beyond the existing formulations that existed in audio tape at that time—most notably the chromium dioxide particle—to produce Avilyn, a magnetic particle consisting of cobalt ions adsorbed (coated) on finely-milled, needle-shaped gamma ferric oxide particles. These early developments in fine-particle audio technology laid the groundwork for breakthroughs in today's video tape technologies—particularly TDK's two newest tapes formulated to meet the demands of today's new wave of high fidelity VCRs. The first of these breakthrough formulations, dubbed TDK EHG Hi-Fi, benefits the videophile who wants to be certain that lifelike video images are coupled with high quality stereo sound. The second breakthrough tape, HD-Pro, is the closest thing the connoisseur video tapest can get to ¼ inch resolution in a half-inch format—a tape which is ideal for live camera recordings, dubbing, special effects work and other pro or semi-pro applications.

**CRITICAL PERFORMANCE**

Both EHG Hi-Fi and HD-Pro share certain technical similarities which enable each to offer visually better results than their competition. TDK accomplished this by further refining Super Avilyn particles so that they are noticeably shorter, thinner and more uniform than particles used in other tapes. This means the tape particles can be packed together more densely to produce better sound and video. In HD-Pro's case, the particles are so fine that they can be packed together 12 times more densely than TDK's own Standard tape.

**DIGITAL AUDIO RECORDING**

A good video tape has wide and remarkably uniform response over a megahertz bandwidth, low noise relative to the signal recordable, and reasonable freedom from dropouts (random losses of signal as a result, usually, of physical imperfection in the tape coating). Digital recording on videotape doesn't care about bandwidth and low noise—but is profoundly disturbed by dropouts. Dropouts in digital audio are heard, and if sufficient in duration can sound as violent as the deepest sort of record scratch. The digital world has learned, as did Asahi Camera's tape tester, that not all video tapes are equal.

Digital usability has become a by-product of TDK's meticulous attention to physical integrity and the uniformity of the cassettes coming off its line. Both HD-Pro and EHG Hi-Fi reflect this careful attention to quality and detail. Remember, however, that these tapes are still the best video tapes you can buy, with features such as a precision-made "S" shell mechanism built to tolerances 2.5 times industry standards, a conductivity back coating, and ultrasmooth base film, contributing to the smoothest running performers on the market.

So whether you're a videophile whose needs are met by TDK's EHG Hi-Fi, or a master "pro" recordist who demands the sophistication of HD-Pro, you'll welcome the benefits of these recent developments. Just visit your favorite retailer and pick out a few to try on your own VCR. You'll quickly discover that the height of video performance just got higher.
Defining a Cost Effective Digital Monitor Loudspeaker

As readers of this publication are no doubt aware, audio technology is in the midst of a world-wide "digital revolution." And it is evident that loudspeaker systems are among the products most affected by the demands of digital program material.

B&W's approach to loudspeaker design has been clearly validated by one simple fact: More conductors, orchestras, and instrumentalists worldwide have chosen B&W 801's as their classical music monitor system. This was true during the recent analog period, and it has continued to be true for today's digital recordings. In fact, it can be said that the B&W 801 has become the definitive monitor for the world's most discriminating recording professionals.

A FORMIDABLE TASK

Late in 1982, B&W set themselves a formidable task: The Research and Development team was commissioned to create a new line of loudspeakers that would embody all that had been learned from the Model 801—and in addition would meet certain other special requirements. The design goal, simply stated, was to make B&W quality accessible to a greater number of music listeners.

The successful execution of the project is expressed in B&W's eight new monitor speakers. The DM Series are legitimate digital monitors that are not only affordable in themselves, but which, through their high sensitivity (efficiency), also reduce the power demands—of a digital playback system.

BEHIND THE DESIGN.

The "design brief" for the DM models had three main requirements:

1. High sensitivity not less than 90 dB SPL with 1 watt input measured at 1 meter. In fact, the DM Series systems offer 5 to 7 dB greater sensitivity than previous B&W systems. In addition to their high sensitivity, the systems must be capable of extremely high acoustical output, approximating that of a live performance.

2. A wide and linear frequency response, mirroring as closely as possible the reference standard—the Model 801.

3. A dramatic reduction in manufacturing costs. To achieve this, the drive units were totally redesigned so as to adapt them to cost-effective automated production methods.

The precision made possible by computer controlled production resulted in systems capable of extremely high performance. In particular, the exceptionally close tolerances between speaker pairs and their good polar distribution provides extremely accurate stereo imaging and depth information.

DM TECHNICAL DATA.

The smallest of the new models, the DM110, is a two-way system with a vented enclosure measuring only 19.3 inches high by 10.25 inches wide by 9.8 inches deep and weighing 18.5 pounds. The 8-inch woofer is crossed over at 3 kHz to the 1-inch dome tweeter via a fourth-order Butterworth squared circuit. Rated sensitivity is 91 dB SPL; frequency response is 70 Hz to 20 kHz ± 3 dB.

Recommended driving power is 10 to 50 watts RMS. Suggested list price is an astonishingly low $149 each, and matching speaker stands are available.

The DM220 is a three-way system with a more extended bass response and greater power handling capability. It employs two 8-inch drivers, one serves as a lower-bass driver, while the other handles the upper bass and midrange frequencies. The same 1-inch dome tweeter is used as in the DM110, and the 3 kHz crossover employs the Butterworth squared configuration plus a first-order difference filter. Rated sensitivity is 90 dB SPL; frequency response is 53 Hz to 20 kHz ± 3 dB. Recommended driving power is 10 to 75 watts RMS. The sealed enclosure of the DM220 measures approximately 26.75 inches high by 11.4 inches wide by 12.6 inches deep and weighs 30.4 pounds. Suggested list price is $249 each, and matching stands are available.

The DM330 uses essentially the same driver and crossover as configuration as the DM220, but in a taller (by 7 inches) floor-standing enclosure. The cabinet design has been optimized by computer modal analysis for improved bass transient response and lower coloration. Sensitivity is improved by 1 dB over the DM220, power handling is up to 100 watts, and bass response (-3 dB) has been extended down to 48 Hz. Suggested list price is $349 each. The top model, the DM 3000, has a suggested list of $895 each.

All eight models in the DM Series are capable of extremely high acoustical output levels. Typically, a pair of DM220s can produce 115 dB SPL in a 3,500 cubic foot room.

In all respects, the models in the Digital Monitor series have more than met their stringent design goals. Their high sensitivity, substantial acoustic output potential, and excellent transient behavior, combined with a broad and linear frequency response, easily meet the technical demands of digital program material—and the musical demands of critical listeners.

B&H
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Proton Offers Some Advice on How to Look at Video Monitors

From its very beginning, Proton has been a product-driven company. About two years ago we found an area where our talents and know-how could make a significant difference. With the improvement in laser discs, and the continued success of music videos, music lovers are beginning to seek full fidelity video to complement their high fidelity audio. To meet that need Proton has designed and produced an excellent video tuner-preamplifier, an exceptional integrated TV monitor receiver, and two superb video monitors with 19- and 25-inch screens. The superiority of the Proton video technology is clearly visible if you know what to look for—and we would like to tell you how to do just that.

The five main technical qualities that distinguish our high-performance monitors from conventional products are: Overscan, Black Level, Linearity, Convergence, and Detail.

OVERSCAN.

Most TV screens do not give you the full picture; in fact, the typical television set crops as much as 20 percent off the edges of the broadcast image! Sets are designed to overscan to compensate for picture size fluctuations. (People seldom notice when the picture edges are trimmed, but they usually complain when the picture doesn’t completely cover the face of the screen.) Size fluctuations occur because a very bright scene can cause the picture to “bloom” (expand) and dark scenes can cause shrinkage. Normal variations in the AC line voltage can also result in picture size shifts. Proton solves such problems by the use of a special—and expensive—ultra-stable power supply. It costs us more money, but you get to see more picture.

BLACK LEVEL.

Black can be beautiful, particularly when you compare the true blacks of a Proton monitor against the dark grays of conventional color sets. The ability to produce the dynamic range from pure black to pure white is the first step toward ensuring picture contrast, color quality, and three-dimensionality. The second step is to maintain the black under dynamic signal conditions. A computer-grade power supply provides the hum-free DC voltage that does the first part of the job; a DC restoration circuit takes care of the rest.

A discussion of the operating theory of DC restoration would more than fill this page, so for the moment let’s just point out the very visible benefits you should look for. The black and white dynamic range strongly affects the range, strength, and subtle shading of colors. In addition, previously unseen detail will be visible in the picture’s black or dark areas, night scenes won’t be lost in grey fog, and a sort of three-dimensional quality (which depends on subtle tonal gradations in the picture) will come through.

LINEARITY.

Most television screens do not produce accurate sizes and shapes. Circles become egg shaped, squares become rectangles, and straight lines bend near the edges of the screen. These problems arise from a lack of geometric linearity. The cure is not to be found with compass and protractor, but rather through paying special attention to the design of the deflection yoke, its task is to magnetically deflect the electron beams passing through the tube neck so as to scan the picture tube screen linearly and precisely. Through careful tube design and precise yoke geometry, Proton achieves a visible improvement in linearity, from top to bottom and edge to edge.

CONVERGENCE.

Also under the precise control of the deflection yoke, there are three separate electron beams shooting through the neck of the picture tube. These are responsible for the red, green, and blue elements on the screen. The beams themselves are colorless, but they are aimed to impinge on sets of phosphorus dots on the inside of the tube face that, when hit by the electron beams, fluoresce red, green, or blue.

These three colors, by themselves or in combination, produce all the colors—including white—that you see on a TV screen! Enormous precision is needed in controlling the intensity and focus of the three beams to ensure the proper color mix in the continuously varying picture.

Although it takes an engineering background to fully appreciate the technical quality built into Proton products, we hope we’ve made the point that you don’t need to be an engineer to see the quality differences built into the Proton picture. Let your own eyes convince you that our television picture is “clearly the best.” For the location of your nearest Proton dealer call toll-free 800-447-4700. For other information write or call:

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MELISSA MUSIC

BIZET: Carmen. Julia Migenes Johnson (soprano), Carmen; Placido Domingo (tenor), Don José; Ruggero Raimondi (bass), Escamillo; Faith Esham (soprano), Micaela; others. Chorus and Children’s Chorus of Radio France; Orchestre National de France, Lorin Maazel cond. EMI/RCA 411 189-1 three discs, $32.94; © EMI 751133 three cassettes, no list price.

Performance. Basically good
Recording. Very good

This new version of Carmen is the by-product of a motion picture to be released in the U.S. this fall. Lorin Maazel presides over a lively performance with generally brisk tempos, maintaining light and transparent orchestral textures in which instrumental details emerge with great clarity. He has an excellent chorus at his disposal, and that includes the children, whose rendering of “Avec la garde montante” is exceptionally authentic-sounding. There are, however, several eccentricities. Maazel’s opening tempo for the Chanson bohème is almost unbearably slow. Things pick up later, but the episode lacks spontaneity. The quintet in Act II is too fast and charmless, and certain later episodes (the “Bel officier” ensemble, for one) are a bit fuzzy.

Placido Domingo has now recorded Don José three times. He towers over all his rivals in this role—and, for that matter, over all his colleagues here. Listeners attuned to a Berganza/Horne/Troyanos kind of mezzo lushness in the role of Carmen will require some adjustment to the light soprano timbre of Julia Migenes Johnson. But she offers an interesting, well-thought-out, and quite convincing portrayal of a wild, sexy, kittenish Carmen who turns into a tiger in the tragic finale.

Ruggero Raimondi’s bass-baritone finds the between tessitura of Escamillo’s music quite congenial: he sings the part well enough, though there could have been more personality projection. The Micaela of Faith Esham, on the other hand, is not yet of high international caliber, particularly in view of her recorded competition. The supporting singers are almost uniformly competent.

BRENDEL’S NEW BEETHOVEN

The new set of Beethoven piano concertos by Alfred Brendel and the Chicago Symphony under James Levine commands special attention. In an album note that is simultaneously charming and enlightening, Brendel gives valid reasons for his recording these works a third time, citing specific corrections made in some of the scores since his last cycle some six years ago. He also points out the aesthetic advantages of recording in concert instead of in a studio setting without an audience. But there’s the rub. The audience is quiet enough during these performances, but Philips has unaccountably decided to give us generous helpings of applause preceding as well as following each one. This is not only tiresome on repeated hearings, but perverse. It is the more regrettable because the performances, collectively and individually, are perhaps the finest yet recorded of these works—and the best sounding.

Everything about these performances is utterly right—so majestic and yet so composed, so profound and yet so charged with wit, so filled with Beethovenian spontaneity yet so meticulous in detail, balance, and proportion. In Levine and the Chicagoans Brendel has the best collaborators he has ever been given in concert recordings. One might revel in the glory of the orchestral playing itself, but the peaks of musical insight reached again and again throughout the cycle render even this level of virtuosity a matter of strictly secondary interest (though still indispensable in making these performances what they are). The recorded sound is superb in detail and in balance, and it is lifelike in the most flattering sense.

On the whole, this is a respectable achievement, captured in excellent digital sonics. The spoken dialogue is closely mixed, which can be distracting, but there is less of it than in the Solti recording for London. In the end, however, Solti’s recording and Abbado’s, on Deutsche Grammophon, remain my choices for this marvelous opera. G.J.

Explanation of symbols:
1 = Digital-master analog LP
2 = Stereo cassette
3 = Digital Compact Disc
4 = Eight-track stereo cartridge
5 = Direct-to-disc recording
6 = Monophonic recording

STEREO REVIEW JULY 1984 75
BOITO: Mefistofele (see Best of the Month, page 66)

BRAHMS: String Quintet No. 1, in F Major, Op. 88; String Quintet No. 2, in G Major, Op. 111. Pinchas Zukerman (viola); Guarneri Quartet. RCA © ARI 4849 $12.98, © ARKI 4849 $12.98. Performance: Radiant Recording: Excellent

Brahms’s two string quintets, both melodic, ripe works of his mature years, have inexplicably been among the least frequently encountered titles in his abundant legacy of chamber music. They may still represent “discoveries” to a large number of otherwise experienced listeners, but they are both thoroughly and luminously Brahmsian in their coloring, characteristic themes, and wonderful range of moods. And it would be hard to imagine either work more beautifully played than they are here. The Guarneri Quartet has never sounded more appealing, and Pinchas Zukerman’s viola fits in seamlessly. Both works are beautifully recorded too, with all the strands clear and in ideal balance. This album may be just what is needed to win a wider audience for these curiously neglected works. In any event, it is one of the most enjoyable chamber-music releases of the last several seasons. Highest recommendation. R.F.

GLUCK: Iphigénie en Tauride. Pilar Lorengar (soprano), Iphigénie; Walton Groenroos (tenor), Oreste; Franco Bonisolli (tenor), Pylades; Dietrich Fischer-Dieskau (baritone), Thoas; Angelika Nossik (mezzo-soprano), Diane; others. Chorus and Orchestra of the Bavarian Radio, Lamberto Gardelli cond. ORFEO © S 052833 three discs $41.94. Performance: Stark Recording: Fine

Iphigénie en Tauride was Gluck’s penultimate opera. When he wrote it he was not at the peak of his creative power but also at his most laconic. It is an austere work.

And this is an austere performance. Both Pilar Lorengar as Iphigénie and Walton Groenroos as her brother Oreste sing with continuous intensity, rigid rhythms, and little vocal coloration. Dietrich Fischer-Dieskau barks out the role of Thoas in an appropriately savage manner. The only humanity in the opera is displayed by Pylades, and Franco Bonisolli makes the most of Pylades’s heartfelt compassion for Oreste. Lamberto Gardelli paces the music spaciously and brings a chill to Gluck’s unyielding nobility of style. Perhaps Gluck’s controlled musical language and chiseled classicism is not to everyone’s taste, but those who appreciate his music will appreciate this fine album. S.L.

MENDELSSOHN: Symphony No. 4, Op. 90 (see SCHUBERT)

MOZART: Sonatas in D Major for Two Pianos (K. 448); Fugue in C Minor (K. 426); Larghetto and Allegro in E-flat Ma-
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MALCOLM BILSON, ROBERT LEVIN (fortepianos). NONESUCH 78023-1 $11.98, © 78023-4 $11.98.

Performance: Impeccable
Recording: Crisp

Although Mozart's Sonata in D Major sparkles with airy melodies and crisp textures, when it is performed on modern instruments it can seem somewhat elephantine and muddy. But here, as it is performed on copies of Classical Viennese fortepianos, the textures are lucid, and the whole affair is transformed into an elegant romp. It is not only the instruments that work toward the transformation: Robert Levin and Malcolm Bilson enhance Mozart's sparkle with their own impeccable sense of articulation, rhythmic drive, and masterly ensemble.

The Larghetto and Allegro in E-flat Major, discovered some twenty years ago, is a real treasure. Although the manuscript takes us only through the exposition of the allegro, Levin's completion of the development and recapitulation is excellent and adds another masterpiece to the two-piano repertoire.

S.L.

RACHMANINOFF: Piano Concerto No. 2 (see Best of the Month, page 64)

RAVEL: Shéhérazade; Trois poèmes de Stéphane Mallarmé; Chansons madécasses; Don Quichotte à Dulcinée; Cinques mélodies populaires grecques. Heather Harper, Jill Gomez, Jessye Norman (sopranos); Don Quichotte or virile Greek peasant. The music and singers are magnificent, and Pierre Boulez and his forces offer refined support that transports us into an impressionistic past that only Ravel could have created.


Performance: Provocative
Recording: Impressive

Giuseppe Sinopoli's performance of the Unfinished bespeaks a view that is profoundly tragic in the first movement and seraphically nostalgic in the second. Tempos are slow but not ponderous, and the dynamic range is extraordinarily wide. Whether you choose to go along with some of the hairpin shadings, dynamics is to some degree a matter of taste. One thing is sure, after you hear this performance you will never hear the Unfinished with quite the same ears again.

The Mendelssohn Italian here strikes me as repely Mengelbergian: a slowish opening movement and an ultra-dignified Andante con moto. Most other conductors working at this pace would make the movement a hopelessly plodding affair, and for those used to the volatile Toscanini or Koussevitzky approach, it may well seem that way. There is ample energy to the finale, with genuine momentum and a delineation of much lovely detail.

D.H.

VERDI: Rigoletto. English translation by James Fenton. John Rawnsley (baritone), Rigoletto; Arthur Davies (tenor), Duke; Helen Field (soprano), Gilda; John Tomlinson (bass), Sparafucile; Jean Rigby (mezzo-soprano), Maddalena; Norman Bailey (baritone), Monterone; others. English National Opera Chorus and Orches-
THE ALARM: Declaration. The Alarm (vocals and instrumentals). Declaration; Marching On; Where Were You Hiding When the Storm Broke; Third Light; 68 Guns; We Are the Light; Shout to the Devil; and five others. IRS SP-70608 $8.98, © CS-70608 $8.98.

Performance: Transparently phony
Recording: Excellent

These guys are being touted in some critical circles as the most exciting thing since sliced bread, apparently because of their fondness for acoustic guitars and political lyrics. Well, I suppose I'm glad they're not another synth dance band, and I'm as big a sucker for a protest song as the next Sixties relic, but I don't believe in these guys for a minute. Neither, I suspect, will you. In fact, once you listen past the Wall of Mud production, past the "White Album"-style martial horn licks, and the old Delaney and Bonnie guitar parts, it's simply another third-rate British punk band that couldn't concoct a memorable tune if their lives depended on it and whose politics, at least as far as I can figure out from the songs here, are so vague they could just as easily be Trotskyites or Young Republicans. Highly underwhelming stuff.

THE CARS: Heartbeat City. The Cars (vocals and instrumentals). Hello Again; Magic; Strange Eyes; It's Not the Night; I Refuse; Looking for Love; and four others. ELEKTRA 60296-1 $8.98, © 60296-4 $8.98.

Performance: Almost endearing
Recording: Excellent

About the Cars... as Joan Rivers would say, can we talk? I mean, does anybody out there, except perhaps Ric Ocasek (who writes the songs), still take this outfit's steely futurist pretensions seriously? Come on, now, these guys are a pop band—always were and always will be. It was not an accident that the intro to their Just What I Needed was exactly the same as the intro to the old bubblegum classic Yummy Yummy Yummy.

"Heartbeat City," the Cars' first album with producer Mutt Lange, sounds pretty much like their others (tick-tock rhythms, massive instrumental layering), though the band seems much less embarrassed than usual about having absolutely nothing to say and more relaxed about getting walk the tightrope between being affectingly plaintive and cloyingly sensitive. He comes off as a reasonable post-liberation version of the early Lou Reed—a bit of a wimp, perhaps, but so is Jackson Browne, whom he also resembles. Beyond that, let's just say that these guys sound promising. Not a great band, certainly, but probably an honest one. And on some cuts here already an exciting one. Stay tuned.

THE SMITHS. The Smiths (vocals and instrumentals). Reel Around the Fountain; You've Got Everything Now; Miserable Lie: Pretty Girls Make Graves; The Hand That Rocks the Cradle; This Charming Man; Still Ill; Hand in Glove; What Difference Does It Make? I Don't Owe You Anything; Suffer Little Children. SIRE 25065-1 $8.98, © 25065-4 $8.98.

The new Sire album by a four-man British rock group called the Smiths is a delicate, even precious, little record in a deliberately anachronistic way. Its quiet intensity has a genuine if fragile appeal. The album's dominant influence seems to be the third Velvet Underground album—which, as one writer described it, was "one long sigh." The parallels are pretty explicit, actually, and go beyond the Smiths' stripped-down Byrdsy folk-rock instrumentation. The cover photo is from an old Andy Warhol film, Flesh, and the band's lead singer calls himself Morrissey, which might be a nod to Warhol's director, Paul Morrissey.

The songs are mostly midtempo love ballads with a not-so-subtle homoerotic ambiguity. They're very matter of fact, however, and seem genuinely felt. Morrissey has a vocal style that manages to walk the tightrope between being affectingly plaintive and cloyingly sensitive. He comes off as a reasonable post-liberation version of the early Lou Reed—a bit of a wimp, perhaps, but so is Jackson Browne, whom he also resembles. Beyond that, let's just say that these guys sound promising. Not a great band, certainly, but probably an honest one. And on some cuts here already an exciting one. Stay tuned.

Steve Simels
THE JUDDS. Wynonna and Naomi Judd (vocals); vocal and instrumental accompaniment. Had a Dream (for the Heart); John Deere Tractor; Isn't He a Strange One; Blue Nun Café; and two others. RCA MHL1-8515 $5.99, © MHK1-8515 $5.99.

Performance: Gutsy
Recording: Very good

The Judds are a mother/daughter duo from the tiny town of Morrill, Kentucky (population fifty, "and most of them cousins"), but Maybelle and the Carters they are not. Naomi (that's the mother) may make her own lye soap, but she's also been exposed to just about all the music that's come down the pike, and you can hear everyone from Bonnie Raitt to the Andrews Sisters in their inflections and dead-eye harmonies.

RCA obviously believes that Naomi and Wynonna have what it takes, and, judging from this first offering, I'd have to agree. Producer Brent Maher culled the selections from some of Nashville's top songwriters (Dennis Linde, Kenny K, and Harlan Howard), and he worked out the arrangements to balance such traditional "instruments" as jugs and washboards with the most contemporary of electric studio sounds. Thus, the Judds sound vaguely country (they pronounce "seit" as a two-syllable word), and their rural appeal is helped along nicely by songs with such back-forty titles as John Deere Tractor. But there is also a decided hip stance to their music, and, all in all, they really do have a sound all their own, one that manages to be progressive while keeping a toe-hold on the Judds' Kentucky roots and front-porch singalongs. To my ears, it is a style as gutsy as it is electrifying. Guts have been in short supply in country music lately, and, for one, am glad the Judds have decided to go for it. Reward them with a listen. A.N.

JUMP 'N THE SADDLE BAND. Jump 'n the Saddle Band (vocals and instrumental). The Curly Shuffle: It Should've Been Me; Deep in the Heart of Texas: The Chicken Song ( Ain't Nobody Here But Us Chickens); Night Life; and four others. ATLANTIC 80141-1 $8.98, © 80141-4 $8.98.

Performance: High spirits
Recording: Very good

It's hard to resist an album whose cover shows six grown men in bed with a horse, and, when you get right down to it, there's no need to. These are the guys who brought you The Curly Shuffle, that lunatic paeon to the Three Stooges that got a fair amount of play on MTV in the spring. If this album is any indication, they are the quintessential frat-party band, a good-time, high-energy, let-it-all-hang-out group that alternates original material with tunes by the likes of Willie Nelson and Brian's Nick Lowe.

The repertoire ranges from big-band to boogie, rock, and jazz, with an occasional country theme thrown in, and, for all their clowning around, these guys are no slouches in the instrumental department. Still, Peter Quinn's big-shot vocals really carry the group along. If he wanted to, Quinn could probably take Jump 'n the Saddle Band out of the novelty-tune realm and put it up against the competition. Be interesting to see what would happen. A.N.

Wynonna and Naomi Judd: a progressive style with Kentucky roots
How Bad and All for the One.

Classic r -&- b style, such as the lovely Just. They settle down and sing songs in the new. They're really at their best when they are doing doesn't seem to be all that make it the best dance cut here. But what tallic vocal and instrumental effects that sound, as on Roctron, which features me-
tics, militarism, apathy, and the politics of personal relationships. The treatments are personal and compelling, never preachy. Fused with the accomplished music writing of Moginie and drummer Rob Hirst, Garrett's raging lyrics make this an album of uncompromising force and conviction. See Midnight Oil if you can, but get this record regardless. M.P.

OMNI. Omni (vocals and instrumen-
als), vocal and instrumental accompani-
ment. On & Off (Love Affair); Roctron;
Just How Bad; Let Me Run It; All for the One; and three others. MERCURY 818 035-1 M-1 $8.98, © 818 035-4 M-1 $8.98.

Performance: Promising
Recording: Good

Although the three members of Omni have been around for years as studio mu-
icians and songwriters, this represents their first exposure as a group on a major album. They have drawn liberally from their roots in rhythm-'n'-blues while lean-
ing at times toward a more electronic sound, as on Roctron, which features met-
alic vocal and instrumental effects that make it the best dance cut here. But what they are doing doesn't seem to be all that new. They're really at their best when they settle down and sing songs in the classic r-&-b style, such as the lovely Just How Bad and All for the One. P.G.

LOU REED: New Sensations (see Best of the Month, page 64)

TANIA MARIA

Braz! has yielded so many musical treasures from its rich blend of Por-
tuguese, Indian, and African cultures that the emergence of Tania Maria, the most exciting new artist to fuse Latin music with jazz, should come as no surprise. Born in the country that gave us bossa nova, Floro Purim, and Milton Nasci-
mento, Tania Maria has since 1980 been living in New York City. She has been paying her dues on the jazz circuit and gaining attention nationally through a se-
ries of excellent Concord recordings. Her fourth album, "Love Explosion," con-

firms her enormous talent.

In her varied roles as composer, singer, and pianist, Tania Maria spans such di-
verse musical horizons that her style might be called contemporary eclectic. Her music, brilliantly melodic and al-
ways accessible, sizzles, surges, and pul-
sates. Her piano style is solid, her voice.

ROBERTS: "Reckoning"

Performance: Mystery rock
Recording: Deliberately difficult

A year and a half ago, R.E.M. wasn't even the best-known band in its home town of Athens, Georgia. But after its 1983 LP, "Murmur," won a number of major crit-
ics' polls, R.E.M. became a band that commands the attention of serious rock

listeners. "Reckoning" contains ten smart, engaging pop tunes shrouded in mystery. The lyrics are frequently ren-
dered unintelligible by Michael Stipes's nasal, slightly slurred vocals, and they're oblique even when you can make them out. Yet they're wonderfully evocative. The music is totally approachable pop made to seem less polished and more al-
lien than it really is by the low-tech pro-
duction. That "Reckoning" just seems to get better—if not more fathomable—
with repeated listenings means R.E.M. can expect the same enthusiasm from lis-
teners that it has won from critics. M.P.
Footloose is another of those torrid teen-cording. Kenny Loggins, Shalamar, Debbie Gibson, and what sounds like enough lyricist flames by Paco de Lucia and what sounds like enough flamenco guitar playing by Paco de Lucia's ecstatic vision of the world of the grand salon, a world that vanished totally with the first shot fired by the guns of Au-

TRADING OFF

Our interchangeability tests indicated that one or both of our samples did not conform totally to the VHS Hi-Fi standard. A tape recorded on the Jensen produced an elevated high-frequency response (+5 dB at 15,000 Hz) when played on the RCA. A tape made on the RCA was down by the same amount at the same frequency when played on the Jensen. Until standard calibrated test tapes become available, there is no telling which machine is "right."

THE VHS HI-FI SOUND QUALITY IS BETTER THAN THAT OF THE FINEST ANALOG TAPE RECORDERs USED AT HOME.

6200 are excellent audio recorders. The VHS format is the only medium allowing up to eight hours of continuous recording time, just right for those interminable Wagner operas. And don't forget that with these machines you are also buying a video recording capability that can be used simultaneously. Their video quality at the slowest speeds seemed to be unaffected by the VHS Hi-Fi process and looked equivalent to what is generally available with top-of-the-line VHS recorders. On the other hand, neither the Beta nor VHS format comes as close to studio-quality video recording as the VHS and Beta Hi-Fi systems come to the joys of movement, I can only report that I didn't tap either of my feet once—

not even the good one. P.R.

ANbuid toard the joys of movement, I can only report that I didn't tap either of my feet once—

not even the good one. P.R.

THE VHS HI-FI SOUND QUALITY IS BETTER THAN THAT OF THE FINEST ANALOG TAPE RECORDERS USED AT HOME.
COMPATIBILITY
(Continued from page 53)

To airborne vibration, the output of loudspeakers, or
bration from footsteps, jarring, or player’s susceptibility to external vi-
user.
lished way to measure it or to deter-
probably because there is no estab-
ble manufacturers or anyone else,
ination. It is never specified by turn-
as rumble, flutter or speed varia-
ond-player compatibility problem
There is a potentially serious rec-
example,

best on free-standing pedestals, for
the speakers are designed to sound
may have before buying a pair. If
positioning requirements a speaker
there are some obvious caveats,
most always necessary. Of course,
liver since some compromise is al-
components can theoretically de-
(Continued from page 53)

from the speakers can, in its most
severe form, cause acoustic feed-
back—a howling or deep rumbling
that not only renders the program
unlistenable but can even damage
the amplifier or speakers. In a mild-
er form, feedback may not be audi-
ible as such yet have an audible ef-
fect in terms of “muddying” the
sound of the program.

In general, the more “softly sprung” record players are less sen-
sitive to feedback effects as well
as to base-conducted vibrations.
Sometimes placing the turntable on
accessory isolating mounts can help,
but the best treatment is pre-
vention: keep the turntable well
away from the speakers and other
sources of vibrations. This may re-
quire some trial and error in the
placement of the components.

THE BOTTOM LINE

These days most name-brand com-
ponents will work well with each
other without any extraordinary
measures to ensure their compati-
ility. But you do need some basic
understanding of what hi-fi compo-
ents are built to do before you start
to assemble a system or buy a new
component to fit into the system
you have. And use common sense.

If you know where the real trou-
ble spots are likely to be, you can
concentrate on them and stop
worrying about the rest of the sys-

tem. Instead of fretting about
whether your preamplifier can live
happily with your Compact Disc
player, for example, you’d probably
do better to give some thought to
how well the speakers you like in
the store are going to work in your
listening room. Real problems, not
theoretical ones, are very common
in this area, and they are not always
very easily solved. But that’s anoth-
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HIRSCH-HOUCK LAB MEASUREMENTS

Because of the almost infinite variety of response curves made possible by the SFC-1 controls, we measured the system's limit conditions and then concentrated on measurements made with the control settings established during our subjective listening tests. We obtained the most pleasing sound balance in our room by setting the LOW-FREQUENCY COMPENSATION to its center position and the HIGH-FREQUENCY COMPENSATION to the upper end of its marked "normal" range. It was apparent that the actual acoustic balance could be made almost anything that one desired. Interestingly, however, these modifications had no effect on the stereo imaging qualities of the system. The system's averaged and smoothed room response, with our preferred control settings, was flat within ±3 dB from 150 to 20,000 Hz. It was essentially independent of the microphone's location in the room. The bass response was a very creditable ±4 dB from 20 to 150 Hz, and it could be spliced to the middle- and high-frequency room curves to obtain a response from 20 to 20,000 Hz. ±6-dB response from 20 to 20,000 Hz. Measurements with our IQS FFT analyzer showed a single dbx SFX-1 speaker's quasi-anechoic response to be about ±6 dB from 180 to 23,000 Hz at a 45-degree angle inward from the front of the room. At 90 degrees inward (facing the other speaker), the output rose smoothly with increasing frequency, changing by about 10 dB from 4,000 to 20,000 Hz. The traditional frontal (0-degree) response curve was somewhat ragged, an expected effect of multiple-driver interference interacting with the characteristics of our FFT system. Measurements of individual drivers, with close microphone spacing, showed them to have smooth outputs in their operating ranges. The group delay, measured on the 90-degree axis, was constant within ±0.4 millisecond from 5,000 to 20,000 Hz.

The SFX-1's impedance was pretty much as claimed and one of the most uniform we have yet measured. It dipped to 3.2 ohms at 100 and 1,000 Hz, and the minimum value of about 2.5 ohms was measured at 20,000 Hz. The maximum values were 4.5 to 5 ohms, measured at several frequencies.

The exceptional uniformity of the speaker impedance tends to support dbx's claim that it is essentially resistive and therefore probably an "easy" load for most good amplifiers despite its relatively low value.

The system's sensitivity (in the midrange) is rated at a 90-dB sound-pressure level (SPL) at 1 meter with an input of 2.83 volts. Our tests tended to confirm this, although the system's directionality makes it necessary to specify the relative orientation between the speaker and the microphone. Our measurements showed an SPL of 94 dB (the maximum output with a 2.83-volt input) on the axis between the speakers and 88 dB on the frontal axis. We measured bass distortion by supplying a constant-amplitude signal to the SFC-1 controller, equivalent to a speaker drive of 2.83 volts at 100 Hz, and varying the frequency downward from that point. Although the SFC-1 greatly increased the drive voltage at lower frequencies, the distortion of the woofers remained quite low. At 50 Hz, for example, it was only 1.65 per cent, even though the speaker was being driven with about 10 watts. Even at 30 Hz, the distortion was about 9 per cent with 45 watts of drive power!

The SFC-1 controller did its job without any degradation of the system's essential signal properties. Its maximum output was in the range of 5 to 6 volts at its frequency extremes. The 1,000-Hz maximum output was 1.7 volts, but that required an input of about 6 volts, a level unlikely to be found at an amplifier's tape outputs! The distortion at a 1-volt output was about 0.01 per cent. A-weighted noise output was 90 dB (0.1 volt).

The pulsed-power capability of the SFX-1 speakers was measured with short-duty-cycle tone bursts at 100 and 1,000 Hz (we were unable to reach the saturation limits of the tweeters at 10,000 Hz) At 100 Hz, the woofers "bottomed" at roughly 500 watts input. At that level, the tone burst produced a house-shaking "thump." At 1,000 Hz, visible waveform distortion appeared on the acoustic output at about 200 watts. These signals did not activate the power-monitor circuits, which respond only to relatively long-duration signals that could overheat the voice coils.

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dbx SOUNDFIELD ONE
(Continued from page 59)

At $2,500 for two speakers and the controller, the Soundfield One system is not inexpensive, but by today's standards it is hardly out of reach for any serious listener. The dbx SFX-1 is a great and important speaker system. Hear it for yourself, but be prepared for dissatisfaction with your present loudspeaker system after you do.

For more information on the dbx SFX-1 Soundfield One speaker system, write to dbx, Inc., Dept. SR, 71 Chapel Street, Newton, Mass. 02195.

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6 THIS IS ELVIS  
(Warner Bros.) The King, from white heat at nineteen on the Milton Berle Show to blubberly self-parody and grisly death. This is more than a rockumentary—it's practically a metaphor for America. The home version contains forty minutes not included in the theatrical release. Most of it is Fifties performance stuff and as riveting as you'd expect. Stereo.

7 RUDE BOY  
(Columbia). A backstage semi-documentary, this spends a little too much on the Milton Berle Show to blubberly self-parody and grisly death. This is more than a rockumentary—it's practically a metaphor for America. The home version contains forty minutes not included in the theatrical release. Most of it is Fifties performance stuff and as riveting as you'd expect. Stereo.

8 THE LAST WALTZ  
(Warner Bros.). The Band's retirement concert, with guest performances by everybody from Van Morrison to Muddy Waters, shot with old-fashioned MGM elegance by Martin Scorcese. A lovingly documented farewell to the road, this is also nothing less than, as one critic called it, "the sight and sound of an era shutting down."

9 ROCK AND ROLL HIGH SCHOOL  
(Warner Bros.). The Ramones, Eating Raoul's Mary Woronov and Paul Bartel, and the delectable P. J. Soles demolish Vince Lombardi High in this delirious parody/homage to those Alan Freed rock-sploitation films of the Fifties. This one has it all, from a great soundtrack (Chuck Berry, the MC5) to a great ending (they blow up the school).

10 WE'RE ALL DEVO  
(Pioneer LaserDisc). A career retrospective, this time a sort of Greatest Video Hits, from a band whose ideas have always been most cogently expressed in visual terms. The best all of the current rock video packages by a mile.

HONORABLE MENTIONS:  
The Rutles (Pacific Arts), Woodstock (Warner Bros.)

MUST-HAVE'S  
AWAITING RELEASE  
The Girl Can't Help It starring Little Richard, Eddie Cochran, Gene Vincent, Fats Domino, and Jayne Mansfield. 

SATURDAY NIGHT FEVER  
(Paramount). Or, A Pompadour Grows in Brooklyn. Starring John Travolta and the Bee Gees' classic disco score, this not only sounds great but has a significant advantage over the LP version: it will probably never wear out.

5 FORBIDDEN PLANET  
(MGM/UA). A Fifties sci-fi version of Shakespeare's The Tempest starring Robbie the Robot and a whale at the conclusion, this film remains a dazzling journey through what Paul Kresh called "the tunnel of hate that was the war in Vietnam." The soundtrack, from the helicopter attack to the Ride of the Valkyries to the Mekong Delta surf scene to the Stones' Satisfaction, is nearly as effective at home as it was in the theater.

MUSIC VIDEOS:  
SONIC SPECTACULARS  
(Continued from page 48)

ROCK & ROLL STEREO CORPORATION  
OF AMERICA  
Dept. 107  
1629 Flatbush Avenue Brooklyn, N.Y. 11210
6 STAR TREK: THE MOTION PICTURE (Paramount). One of the great light shows of all time, the special longer version offers some of the most impressive stereo sound effects ever created for a feature film. Jerry Goldsmith's score is also one of the loveliest ever. Goldsmith's score is also for a feature film. Jerry sound effects ever created most impressive stereo version offers some of the.

7 WEST SIDE STORY (MGM). If you can overlook the fact that everybody in this movie of Leonard Bernstein's musical, including Natalie Wood, looks like a member of Mink DeVille, you'll find it is still one of the niftiest of all film musicals. And though the stereo sound is not quite Eighties state of the art, it's such a kick to have it blasting in your living room that you probably won't care.

8 A STAR IS BORN (Warner Bros.). More Fifties stereo and remarkably good in this restored version. Your TV set may not be able to reproduce George Cukor's groundbreaking Cinemascope visuals, but, here again, the terrific sound supplies the sense of scale.

9 RAIDERS OF THE LOST ARK (Paramount). The greatest Republic serial Republic never made, this Steven Spielberg/George Lucas collaboration features Harrison Ford and an exceptionally realistic audio track. The sound of the giant boulder in the opening temple scene alone is worth the price of the LaserDisc (the VHS stereo version is merely okay in comparison).

10 AROUND THE WORLD IN EIGHTY DAYS (Warner Bros.). Mike Todd's all-star rendering of the Jules Verne fantasy is less fun now than I remember its being when I saw it as a child. and some of the movie's wide-screen visual effects are necessarily compromised in my living room, but the soundtrack works. You haven't lived until you've experienced David Niven's brittle charm in early stereo.

Looking at Music BALLET AND OPERA

Kolpakova and Sergei Berzhzhov dance the leading roles. and Viktor Fedotov conducts. Sound and sight have been superbly captured by Russian television director Elena Macheret, who choreographed the cameras with appropriate sensitivity and grace.

9 SPARTACUS (Video Arts International). Made in 1977, this film is slightly flawed by the kind of jumps and wear you might expect from a much older print, but it is a splendid cinematic effort with stellar performances by Vladimir Vasilev in the title role and Marcus Liepa as Crassus, the villainous Roman general. Choreographer Yuri Grigorovich directed the definitive ninety-five-minute Bolshoi Theater production, and A. Zhuraitis conducts the Khatchaturian score.

10 SAMSON ET DALILA (Pioneer LaserDisc). This was a 1981 performance at the Royal Opera House, Covent Garden, preserved by the BBC with typical expertise. Jon Vickers and Shirley Verrett seem to have been born to the title roles. Colin Davis conducts.
BY RICHARD FREED

For some years critic Richard Freed, a contributing editor of STEREO REVIEW, has listened to all available recordings of the nearly two hundred symphonic works that form the essential core of orchestral programs and classical record collections, selecting those versions he considers the best. We have published his choices in a pamphlet, which we have updated periodically, and we are now publishing his selections of the best current recordings of the Basic Repertoire in a series in the magazine. All those cited are stereo LP's unless indicated otherwise by our usual symbols.

- RODRIGO: Concierto de Aranjuez. Narciso Yepes's oldish recording with Argenta conducting remains for me the most persuasive of the several excellent accounts of this most beloved of all guitar concertos (London STS 15199, © STS5 15199). Among the newer and more expensive versions, Alfonso Moreno's, with Enrique Bátiz conducting, is especially recommendable, not only in its own right but also for the little-known material on the other side (Angel © DS-37876, 4XS-37876).

- ROSSINI: Overtures. RCA's digital remastering of the Reiner collection, still at the low Gold Seal price, makes it competitive with the best available, and the selections are choice (AGL I-5210, © AGK1-5210). An outstanding mixture of familiar and unfamiliar titles is served up by Riccardo Chailly (London © LDR 71034, © LDR3 71034, © 400 049-2). Abbado's album is nearly as fetching (RCA ARLI-3634, © ARK1-3634). None of these collections includes Semiramide; for a broader selection, the best combination of two discs without duplication would be Peter Maag's (London STS 15030, © STS5 15030) and the first of Marriner's five packages of this material (Philips 6500 878, © 7300 368).

- SAINT-SAËNS: Carnival of the Animals. The recording by André Previn and the Pittsburgh Symphony excels in every respect and in every format (Philips © 9500 973, © 7300 973, © 400 016-2). For the original chamber version, try Jörg Faerber on disc (Turnabout TV 34586) or Philippe Entremont on tape (CBS © MT 33585). Anyone who really wants the Ogden Nash verses should buy the original recording in which Noel Coward recites them with André Kostelanetz conducting (Odyssey © Y 32359).

- SAINT-SAËNS: Piano Concerto No. 2, in G Minor. The new recordings by Cécile Ousset, with Simon Rattle conducting (Angel © DS-38004, 4XS-38004), and by Pascal Rogé, with Charles Dutoit (London CS 7253, © CS5 7253), are both outstanding. Entremon's older version with Ormandy (CBS MS 6778) is superior to his remake with Plsson, and the Tacchino/Froment is a genuine bargain (Candide QCE 31080, Vox © CT-2124, or in Vox QSVBX-5143, © CBX-5143).

- SAINT-SAËNS: Symphony No. 3, in C Minor "Organ". Charles Dutoit and the Montreal Symphony Orchestra, with organist Peter Hurford, may be said to sweep the field with their extremely sympathetic, brilliantly recorded performance (London © 0 LDR 71090, © LDR3 71090, © 410 201-2), but Munch's 1959 Boston recording, re-revitalized in RCA's half-speed remastering, is still a contender for top honors (ARP1-4440, © AREI-4440).

- SCHOENBERG: Transfigured Night. Several of the choice string-orchestra recordings have been deleted recently. Of the surviving ones, Horenstein's (Turnabout TV 34263) and Stokowski's (Seraphim S-60080) are the most expressive, Neumann's a bit brighter sounding (Quintessence PMC-7177, © PACA-7177). There are appealing renderings of the sextet version by the Ramor Quartet and friends (Turnabout TV 37012, © CT-7012) and from the Santa Fe Chamber Music Festival (Nonesuch © 1-79028, © 4-79028).

- SCHUBERT: Symphony No. 8, in B Minor "Unfinished". Top honors may be divided between Carlos Kleiber's profound, freshly thought out reading (DG 2531 124, © 3301 124) and Joachim's powerful, heartfelt Boston performance (DG 2530 318). Also exceptional are Böhm's live Viennese remake (DG 2531 373, © 3301 373), Klemperer's (Angel RL-32038, © 4RL-32038), and the latest by Karajan (Angel © SZ 37544, © 4ZS-37544, or in SE-3862).

- SCHUBERT: Symphony No. 9, in C Major "The Great". The Munch/Boston version, back on cassette only (RCA © Victrola ALKI-4507), is a marvelously exuberant performance, well recorded, and now an incredible bargain. At the expensive end of the scale, I like Heinz Rogner's provocative, grand-scaled digital recording (Denon © OB 7350-51-ND, © 38C37-7035). Karajan's DG version, reissued now in the Privilege series, is a gem (2535 290, © 3335 290). Szell's CBS recording stands up beautifully in its latest transfer (MY 37239, © MYT 37239). Böhm's Dresden remake is marked by a splendid balance between majesty, urgency, and lyricism (DG 2531 352, © 3301 352).

- SCHUMANN: Piano Concerto No. 1, in B Flat Minor. The new recordings by Arthur Rubinstein and the Royal Festival Hall Orchestra (Angel © DS-38099, © 4XS-38099) are the most attractive of the new ones, and the original by Arturo Benedetti Michelangeli, with the American Symphony Orchestra (Angel © DS-37899, © 4XS-37899), is still a contender for top honors (ARP1-4442, © AREI-4442).

- STRAUSS: Don Quixote. Among the new and more expensive versions, Sir Georg Solti's (Decca © SXL 7501) is highly recommended, far more convincing than the earlier Solti for RCA (© 0 LDR 67285, © LDR3 67285). A remarkable bargain is the Angel tape (© 4RL-32041), which captures the original performance.
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BY RALPH HODGES

AUDIO/VIDEOPHILIA

WHEN assembling an audio system today, high-end or otherwise, it behooves the purchaser to consider whether, sooner or later, some form of video might not wind up as its centerpiece. This is true even if you've decided that music videos are not for you or that TV, stereo or not, is going to remain TV. The chances are too good that, somewhere down the line, a particularly effective amalgamation of audio and video will grab you seductively, awaken your acquisitive instincts again, and send you back to the store for an additional something you hadn't realized you couldn't live without. That something could well turn out to be a wide-screen or projection TV, so plan ahead while there's time.

Of course, it's farfetched to imagine that anything like video games will cause you to want a seven-foot picture between your Acoustat towers (although, even at this moment, somewhat sophisticated stereo music is being synthesized and recorded for the next generation of arcade time-wasters). No, you will probably succumb, as so many audiophiles have in the past, to motion pictures and their more-ambitious-than-ever soundtracks.

With good reason, film critics have been advising that a Hollywood spectacular is only half experienced if not heard in a proper cinema auditorium with large batteries of behind-the-screen loudspeakers together with arrays of "surround" speakers around and behind the audience section to deliver sonic information about off-screen action. And the result is often well worth dragging yourself downtown to a showcase theater for. But now, today, you can also take it with you—take it home, that is, to a domestic screening room that, sonically at least, can equal or exceed the impact of the $5 seat in the movie palace. To the minds of those who are involved with it, that is what high-end audio for video is all about.

The key development has been the establishment of Dolby Stereo optical soundtracks as a de facto standard for the cinema industry. These two tracks running along the edge of the film furnish properly equipped theaters with left- and right-channel information for a true stereo presentation, a derivable center channel, and a matrix-encoded surround channel that is extracted electronically and piped to side and rear speakers. The scheme is nothing more than the matrix-quadraphonic technology of the 1970's in a new but not fundamentally different application, and the recorded information is accessible to virtually any home quadraphonic decoder, simple or complex, ever made.

None of this would be of more than passing interest if the soundtracks in question were not available to the home consumer. But they are. Any Dolby Stereo motion picture actually released in stereo, whether on tape or disc, is reproduced from the same audio recording that created the stereo optical print for theater release—or is perhaps reproduced directly from a theater print. Everything the theater needs for its most ear-stunning effects is right there in the hand that has paid money for a video tape of Raiders of the Lost Ark, and to deprive yourself of the full worth of such a soundtrack is foolishness.

But what do you do with it once you've got it? For his own home setup, Tomlinson Holman, technical director of Lucasfilm [Raiders of the Lost Ark, Star Wars] and designer of the state-of-the-art THX theater sound system, started with the classic seven-foot Advent Videobeam picture, added front and rear pairs of Boston Acoustics A40 speaker systems along with a subwoofer (for summed left and right), and drives them, suitably amplified, with a Pioneer SP-101 signal processor, which decodes the surround channel reasonably well ("I do get a bit of 'dialog shift' to the rear occasionally," he reports) and provides some bass enhancement. Processors from Fosgate and Surround Sound, Inc. are intended for the same home-decoding application.

Such is the outlook for high-end audio video in the near future that at this point further words from me are not particularly relevant. Rather, now is the time for all interested parties to go out and experience one
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SPECIAL REPORT: HOME THX SOUND

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But beyond the outstanding acoustic qualities of the CS150, there is the tremendous placement flexibility its design offers. Its low-profile allows it to blend unobtrusively with your TV. On top of the TV, beneath it, or even beside it, the uniquely angled cabinet lets you focus the image to your viewing position.

What's more, unlike other center channel speakers that use only magnetic shielding to prevent video interference, the CS150's driver baskets are engineered in a non-magnetic material. Guaranteeing no picture distortion or discoloration.

Further adding to your surround sound experience, is the fact that all five speakers are from Polk. Since they all have the same sonic characteristics, you get a more faithful reproduction of surround sound encoded video.

So if you're considering new speakers, go all the way and surround yourself with the sound of Polk.

The center channel is free through March 31, 1994. After that, this remarkably low price has only one place to go. Up.

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CIRCLE NO. 25 ON READER SERVICE CARD
A Home THX sound system might include these Boston Acoustics speakers, the Lexicon CP-3 controller, and the Carver TFM-350 power amp. The TV set here is a 27-inch Toshiba CN-27C90. For details, see Tomlinson Holman’s special report beginning on page 54.

Photograph by Roberto Brogan
HOME THEATER GUIDE ON VIDEO

Dolby Labs is offering a 48-minute video primer entitled Consumer Guide to Home Theatre. The VHS tape, which includes advice on setting up a multichannel system, can be ordered direct for $19.95, plus $2.50 for shipping and handling; call 1-800-241-4115.

MOVIE MUSIC ON CD

When the Recording Industry Association of America tallied sales figures for 1993, they found that the soundtrack for The Bodyguard, containing six new songs by Whitney Houston, emerged as the top seller of the year with 10 million copies. The hit movie Philadelphia begins with Bruce Springsteen's Streets of Philadelphia and ends with Neil Young's closing theme, Philadelphia, which are the first songs these two artists have written and performed specifically for use in a film. Both are on Epic's release of music from the picture, which also includes performances by Peter Gabriel, Sade, the Spin Doctors, and others. A second Philadelphia album from Epic includes Howard Shore's orchestral score plus operatic arias sung by Maria Callas and Lucia Popp. A star has been placed in Hollywood's Walk of Fame for the French composer Maurice Jarre, whose Oscar credits include Lawrence of Arabia (1962), Doctor Zhivago (1965), and A Passage to India (1984).

INSTANT GUITAR HERO

Now you can jam along with your favorite songs using the Key ($400), a guitar-shaped synthesizer from Lonestar Technologies that lets you select which instrument—bass guitar, lead guitar, etc.—you want to "play" and then simply strum along. Specially encoded videotapes and CD's send data containing the melody and chords to the Key—all you have to provide is the rhythm. Atlantic Records is releasing several Key-encoded music videos, including Strange Brew featuring Eric Clapton.

STIV LIVES

Members of the Stiv Bators fan club will be happy to know that the 1981 film Polyester, in which Bators made his movie debut in the role of Bo-Bo Belsinger, has been released on laserdisc in the prestigious Criterion Collection. Starring Tab Hunter and Divine, Polyester was directed by the cult figure John Waters. To recreate in home video the Odorama effects of the theatrical presentation of Polyester, a scratch-and-sniff card containing ten fragrances keyed to significant plot events is enclosed with each disc.

“TARNISHED” CD’S TURN UP

PDO Discs, a Philips-owned CD pressing plant in Blackburn, England, has announced that a "small number" of CD's it manufactured in the late Eighties are susceptible to tarnishing that may disrupt a CD player's ability to read them. The faulty discs, which have a reflective layer made of silver instead of the more common aluminum, tend to exhibit a dark bronze-like tint and bear the words "Made in the U.K. by PDO" near the spindle hole.

PDO has set up a hotline in the U.K. (0800 387063) to help owners of suspect CD's at that facility. Discs that are found to be defective will be replaced, and data from hotline calls will be used in research on the degradation process.

According to PDO's Dave Wilson, there are no plans for a hotline in the U.S. "A small number of titles are affected, and within those titles a small number of discs," he said. He termed U.S. distribution of the flawed discs "unlikely" but didn't rule out the possibility that some may turn up here, noting that two calls from the U.S. were received during the hotline's first few weeks of operation.

Wilson said PDO presses discs for a number of labels, including PolyGram. He declined to identify specific titles that may be affected but said the problem has turned up in both pop and classical releases.

ECOLOGICALLY SOUND

Hollywood Records has released the first album recorded and mixed entirely with solar energy, "Alternative NRG," featuring such well-known performers as Annie Lennox, Sonic Youth, R.E.M., and U2. Even the wrapping and packaging have been declared ecologically correct. Sales benefit Greenpeace, a noted organization of environmental activists.

SURROUND-ONLY CD’S FROM NEW LABEL

Keith Olsen, the producer behind such pop acts as Fleetwood Mac, Foreigner, and Heart, has launched the Kore Group label, which will specialize in music CD's recorded in Dolby Surround. The first release is a 16-minute disc of Emerson, Lake, and Palmer's new studio recording of their "Pictures at an Exhibition," which is available direct for $5.99, plus $1.50 for shipping and handling. Call 1-800-241-4115 to order.

AUDIO BITS

The annual High-End Hi-Fi Show sponsored by Stereophile magazine will be held April 29 through May 1 at the Doral Resort and Country Club in Miami. Call 505-982-2365 for details.

Collins USA, the maker of tube-type car subwoofers based in Costa Mesa, California, has introduced two "budget" powered subwoofers for home use.

BY WILLIAM LIVINGSTONE AND BOB ANKOSKO
Most loudspeakers touted for “Home Theater” are little more than patched up audio models. That’s because most speaker manufacturers don’t build their own drivers, the components that produce the sound. Instead, they buy off-the-shelf parts and struggle to reconfigure them for Home Theater.

Celestion’s Shield Series was created specifically to suit Home Theater applications, both acoustically and aesthetically. They employ Celestion-designed, magnetically-shielded drivers, integrated into elegant cabinets using proprietary construction technologies.

Compare each Celestion Shield model with any comparably priced so-called Home Theater speaker. Immediately, you will realize...
Letters

Cable/VCR Compatibility

In January's "3 Hi-Fi VCR's," Edward Foster mentioned that some cable systems scramble everything they transmit, requiring the use of an external decoder for descrambling and channel selection, but he said that this may end soon thanks to a recently proposed FCC ruling to insure cable-box/VCR compatibility. Do the provisions of the proposed ruling mean that if and when it is passed I will be able to do away with my cable box and select all the channels I am paying for with the tuners in my TV and VCR? When will this happen, and will it apply to all cable systems?

George L. Fechter
Moncks Corner, SC

We're not certain exactly when the cable-compatibility issue will finally be put to rest, though it does now appear that it will be forced to some resolution. It is very likely that whatever solution is adopted will be effective only for new TV sets and VCR's designed specifically to take advantage of it.

Sinatra's "Duets"

Pardon me, but has Steve Simels listened to Frank Sinatra's "Duets" album? Before I listened, I too had serious doubts about The Voice, believing like Mr. Simels that Sinatra was "simply years past it," and I was also disturbed because his celebrity vocalists were dubbed in after the original recording sessions. My doubts vanished, however, the first time I listened to "Duets," and my appreciation has increased with further listening. Mr. Simels has every right to dislike it, but his description of it as an "unholy mess" in his cruel and inept tirade in the February issue makes me angry. His holy mess?

Mr. Simels's ignoble review of Frank Sinatra's "Duets" is the worst record Frank Sinatra ever made. It is better than any garbage that passes for music today. When will these smart aleck "reviewers" learn there is something besides the current muck? When anything decent comes along, they can't wait to trash it.

E.A.R.L. Jenkins
Covington, KY

I feel compelled to respond to Steve Simels's ignoble review of Frank Sinatra's "Duets." Is Mr. Simels aware that "Duets" is on its way to becoming Mr. Sinatra's best-selling recording?

David F. Lynch
Upper Darby, PA

What is Steve Simels's problem? His comments about Frank Sinatra's "Duets" defy comprehension.

Harry L. Lichtenthal
Wethersfield, CT

Looking for Stereo AM

Daniel Kumin's "Getting It All Together" (February) included a paragraph about AM radio, and he mentioned that "a few home receivers can now decode" stereo AM broadcasts. I have not been able to locate any such receiver, only a couple of very expensive separate tuners. I was informed by one manufacturer that there are at least five different broadcast specifications for stereo AM (one of which, I presume, is called AMAX), and that even if I could find a receiver with stereo-AM capability, it would not necessarily be able to decode the stereo signals broadcast by my local AM station, WQEW. I called WQEW, and they were unable to help me. Can you?

Jack Benven
Ridgewood, NJ

The article should have said "tuners" rather than "receivers." Although there were initially a number of broadcast standards for stereo AM, by far the most widely used one — and the only one for which you will find receiving equipment—is the Motorola C-QUAM system. AMAX is an enhanced performance standard for AM broadcasting and reception, not a stereo-transmission scheme.

Disgraceland

I generally enjoy your magazine very much, but I believe the music review section is weakened by its limited format. Since you have only one reviewer per item, obviously the tone of any review depends heavily on one critic's musical taste and background, or even his mood. Okay, I can live with that. In the January issue, Ron Givens's review of Heart's "Desire Walks On" was, at best,
Even Orson Welles didn’t sound this real.

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Crunching footsteps behind you. Laser beams shooting over your head. Just a typical night at home with Adcom’s home theater GTP-600 tuner/preamplifier. At Adcom’s level of critically acclaimed performance it doesn’t just produce surround sound. It creates effects that are out of this world.

The award-winning GTP-600 and an Adcom power amplifier give you the control to create a sonic experience that surpasses anything you’ve ever heard in a movie theater.

Award-winning technology takes you to the outer limits.
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These features couple ideally with the GTP-600’s advanced, programmable remote which lets you command up to eight additional system components for complete home theater control.

Surround yourself now at your Adcom dealer.
Preview the new GTP-600 tuner/preamplifier at your authorized Adcom dealer today. But be careful, you might want to leave the lights on.

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well off base. Okay, I could have lived with that—I knew his opinion was not even close to reality. But in your February issue, you listed it among the ten worst pop albums of 1993. That was unacceptable.

ROBERT J. CALABRO
Yonkers, NY

Whose idea was it to put Meat Loaf’s “Bat Out of Hell II” in the ten worst albums of the year? I think it’s one of the greatest ever. It surely doesn’t deserve to be on anyone’s ten-worst list.

GREG CRUCE
Fredonia, KY

While you techno-weenies have been measuring waveforms and counting watts, the rest of the world has been using the equipment you review to listen to music. Your inclusion of U2’s “Zooropa” in your “Disgraceland: The 10 Worst Pop Albums of 1993” illustrates the depths of your ignorance.

STEVEN MARTIN
Boston, MA

Speaker Sound and Location

Julian Hirsch wrote in his February test report on the RDL Acoustics F-1 and FS-1 speakers that they had essentially the same “truly excellent” performance when each was placed as recommended, but that he heard differences in their sound. (Although otherwise identical, the F-1 is optimized for placement near a wall, the FS-1 for placement on a floor away from the walls.) Mr. Hirsch is correct, and this difference was to be expected. Although their different designs enabled each speaker to inject smooth power into the room at their different locations, a speaker cannot control how the room distributes that power. The fact that their locations were different meant that the room resonance modes were excited differently, and therefore that the spectral balance produced would not be the same at a given listener location. An even greater difference in sound would occur if identical speakers were placed at these different locations, because their power outputs would then be different also.

ROY ALLISON
RDL Acoustics Inc.
Bellingham, MA

Hum Reduction

The reason for conflicting results using two baluns wired back-to-back for hum reduction (February “Letters”) is that there are two different ways these little devices are wired. One type will still have a common ground if a pair is wired back-to-back and will not work for hum isolation. There are many brands and models of balun, and the only reliable way I know of to tell which is which is with an ohmmeter or continuity tester.

TOM FORD
Campbell, CA

SHOCKINGLY DEEP BASS. Add our SUB-712 powered subwoofer to your system and you’ll be struck by the impact of its low end. Call 1-800-B78-TIME.

DCM Loudspeakers

How can I obtain the MAGIC box from Mondial Designs described in Peter Mitchell’s “Getting the Hum Out” (November 1993)? I live in San Diego, and it seems impossible to find it here.

DAVID ZAHIRI
Encinitas, CA

You can write to Mondial Designs at 2 Elm St., Ardsley, NY 10502.

Corrections

Our February review of the DGX Digital Deconvolution Audio System misstated its price. The correct price is $1,995 for systems with loudspeakers finished in medium-oak woodgrain vinyl, $2,195 for systems finished in rosewood veneer.

Our March review of the Yamaha CX-2 A/V preamplifier erroneously described its loudness compensation, which works by attenuating the midrange and, to a lesser extent, the treble. Also, the back-panel control connection for Yamaha MX-1 and MX-2 power amplifiers actually turns these amplifiers on and off. We regret these errors.

We welcome your letters. Please address correspondence to Editor, Stereo Review, 1633 Broadway, New York, NY 10019. You should include your address and telephone number for verification. Letters may be edited for clarity and length.
The best system for the videophile is now the only choice for the audiophile. Kinergetics Research introduces the **High Performance Home Theatre**™ (HPHT) system.

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For the videophile, convenient remote control audio/video switching and built-in surround analyzer set up.

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Visit a Kinergetics Research dealer near you and experience HPHT.
A little voice tells you to buy NHT.

Gun shots and screeching tires don't tell a story, they're just the punctuation. Movies are mostly dialog. So before you buy your home theater speakers, audition NHT. Our critically acclaimed systems deliver the whole story, from spoken word to subtle sound effect. And when the script calls for a nuclear blast, you'll think you're sitting at ground zero. NHT home theater — you really should hear what people are saying.
NEW PRODUCTS

Audio Control’s C-101 Series III equalizer/analyzer combines a pink-noise generator, a real-time spectrum analyzer with adjustable resolution and an outboard calibrated microphone, and a ten-band stereo graphic equalizer in one standard-width component. Equalizer controls are spaced one octave apart, starting at 32 Hz, and grouped in stereo pairs. The unit has a selectable infrasonic filter and carries a five-year warranty. Price: $459. Audio Control, Dept. SR, 22410 70th Ave. W., Mountlake Terrace, WA 98043.

• Circle 120 on reader service card

B&W LOUDSPEAKERS

Part of B&W’s 2000 Series of audio/video speakers, the Model 2000 IFS center-channel speaker combines two magnetically shielded 5-inch woofers and a 1-inch tweeter in a 17½-inch-wide vented enclosure designed for placement on a TV set (as shown) or below it. A pair can be also used, one above and the other below the screen, to center the sound vertically as well as horizontally. Frequency response is given as 95 Hz to 20 kHz ±3 dB. Price: $199. B&W Loudspeakers, Dept. SR, P.O. Box 8, North Reading, MA 01864-0008.

• Circle 122 on reader service card

SENNHEISER

The heart of Sennheiser’s IS 450 wireless headphone system is an AC-powered infrared transmitter/emitter designed to saturate a 375-square-foot room. The headset has a volume control and is powered by two rechargeable NiCd batteries, which are said to provide up to 8 hours of continuous listening per charge. Price: $249. Sennheiser, Dept. SR, P.O. Box 987, Old Lyme, CT 06371.

• Circle 121 on reader service card

PARADIGM

Paradigm’s Mk3 Performance Series includes four speakers: from left, the 33½-inch-tall Model 5seMk3 ($529 a pair), the 34½-inch-tall 7seMk3 ($629 a pair), the 37-inch-tall 9seMk3 ($729 a pair), and the 43½-inch-tall 11seMk3 ($1,049 a pair). Low-frequency limits are given as 32, 34, 32, and 28 Hz, respectively, all within ±2 dB. Finish options are oak or black-ash vinyl veneer. Distributed by AudioStream, Dept. SR, P.O. Box 2410, Niagara Falls, NY 14302.

• Circle 123 on reader service card
NEW PRODUCTS

NORDOST
Nordost's 12-gauge-equivalent Super Flatline cable is designed for biwired speaker systems. Thinner than a dime so it can be laid under a rug or carpet and said to be extremely durable, it features sixteen Teflon-encapsulated copper conductors. Price: $20 per meter. Nordost, Dept. SR, 58 Pearl St., Framingham, MA 01701.

ALPINE
Alpine's Model 5960 six-disc car CD changer, measuring only 10 x 2 1/2 x 6 inches, can be installed under a seat or in the glove box of many vehicles. Its new tray-type magazine and sliding play mechanism reduce disc-change time to 8 seconds. An Alpine CD controller or head unit with changer controls is required for operation. Price: $420. Alpine, Dept. SR, 19145 Gramercy Pl., Torrance, CA 90501.

ALLISON ACOUSTICS
The home-theater-oriented NL Series from Allison Acoustics includes, from left, the NL 654 two-way surround speaker ($280), the NL 5400 subwoofer ($460), and the NL 1440 two-way front-channel speaker ($330). The 13 1/2-inch-tall NL 654 uses a 6-inch woofer and has a low-frequency limit of 58 Hz. Measuring 19 x 21 1/2 x 19 inches, the NL 5400 has a 12-inch driver and is rated down to 28 Hz. The 18 1/2-inch-tall NL 1440 features an 8-inch woofer and is rated down to 41 Hz. All are magnetically shielded, finished in black lacquer, and covered by full five-year warranties. Allison Acoustics, Dept. SR, 478 Stanford Ave., Danville, KY 40422.

PROGRESSIVE DESIGN
Progressive Design offers five Roll-Up CD Towers: clockwise from left, the 69-inch-tall RUCD-220 ($200) and RUCD-110 ($120), the 44-inch-tall RUCD-132 ($130) and RUCD-066 ($80), and the 29-inch-tall RUCD-088 ($100). Progressive Design, Dept. SR, 310 County Line Rd., Bensenville, IL 60106.

MEDIA VISION
The deluxe version of Media Vision's Memphis multimedia upgrade system for desktop computers features two detachable Bose speakers, each of which houses a 2 1/2-inch wide-range driver and an amplifier/equalizer. The system includes a double-speed CD-ROM drive with preamplifier, an interface card, connecting cables, and two CD-ROM's. Price: $1,299. Media Vision, Dept. SR, 47300 Bayside Parkway, Fremont, CA 94538.
You've never heard anything like this.

With Sensurround™ Home Theater you won't just be surrounded by sound, you'll be enveloped, involved, and like never before, entertained. Cerwin-Vega originally designed Sensurround (with MCA®) to bring deep bass into movie houses. Now we can bring it into your house. Our 5-piece speaker system for direct-view televisions (pictured here) and 7-piece system for projection TVs give you extremely high sensitivity and wide dynamic range (both exceed 90 decibels). As a result, you'll feel violent explosions as well as violin solos. On that note, Sensurround speakers are well-suited to music.

So you don't need separate speakers for audio and video. What you will need is an AV receiver with Dolby Pro Logic® and a fairly large screen TV. Not to mention, a sub of Orville Redenbacher's® and a ticket booth. Cerwin-Vega Sensurround. It makes big screen tele-

Sensurround Home Theater Speaker Systems

[Winner Of The 1992 Design And Engineering Award]

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NEW PRODUCTS

**DENON**
The CDC-815 CD player is built around Denon's Super Linear D/A conversion circuitry, which is designed to eliminate zero-cross distortion and improve linearity at low levels. For those who like to sing along with CD's, the player has a digital pitch control that's adjustable in 0.1-percent increments over a range of ±12 percent. Other features include a twenty-track program memory, a headphone jack with a separate level control, a coaxial digital output, and a remote control. Signal-to-noise ratio is given as 107 dB. Price: $300. Denon, Dept. SR, 222 New Road, Parsippany, NJ 07054.

**ALTEC LANSING**
Altec Lansing's Model 120 speaker is designed for surround-channel use in a home theater system. Its quasi-dipole driver configuration mates a 5 1/2-inch woofer with two side-firing 3-inch drivers in an 11 1/2-inch-tall cabinet finished in black vinyl. Frequency response is given as 100 Hz to 7 kHz ±3 dB. Price: $250 a pair. Altec Lansing, Dept. SR, P.O. Box 277, Milford, PA 18337-0277.

**STILLWATER DESIGNS**
Stillwater's Kicker Substation car subwoofers include the KSR120 (left, $429) and KSR100 ($379), featuring a 12- or 10-inch driver in ported cabinets 31 or 25 inches long. The KSR120's bandwidth is given as 36 to 129 Hz and power handling as 200 watts, the KSR100's as 39 to 130 Hz and 250 watts. Both models come with mounting hardware. Stillwater Designs, Dept. SR, P.O. Box 459, Stillwater, OK 74076.

**COAST**
Coast's LP-size CD Album ($25) has a cushioned-vinyl cover and holds forty-eight CD's and their liner notes in soft-plastic sleeves. The twelve-page binder-type album can be expanded using six-page refill packs ($9.95) that hold twenty-four discs with liner notes. Coast Manufacturing, Dept. SR, 200 Corporate Blvd. S., Yonkers, NY 10701.

**PERREAUX**
Among the components New Zealand's Perreaux is banking on to re-establish itself in the U.S. are the EP3 preamplifier (top, $845), with six inputs and a phono section, and the E110 power amplifier ($1,095), rated to deliver 100 watts per channel into 8 ohms, or 160 watts into 4 ohms, with 0.003 percent distortion at 1 kHz. Perreaux Technologies America, Dept. SR, P.O. Box 248, Buffalo, NY 14225-0248.
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**NEW PRODUCTS**

**SAMSUNG**

Samsung's VR8903 four-head VHS Hi-Fi VCR supports the VCR Plus recording system, which lets you record selected TV shows automatically by keying in codes given in many newspaper TV listings and in TV Guide. Other features include on-screen menus, jog and shuttle editing controls, and a remote control. Price: $600. Samsung, Dept. SR, 105 Challenger Rd., Ridgefield Park, NJ 07660. *Circle 136 on reader service card

**SOUND DYNAMICS**

The R-616 tower speaker from Sound Dynamics is a two-way vented system with a pair of 6½-inch woofers and a 1-inch metal-dome tweeter. Frequency response is given as 34 Hz to 22 kHz ±3 dB, sensitivity as 87 dB, and maximum power handling as 150 watts. The cabinet measures 8¾ x 35½ x 14 inches and is finished in black-ash vinyl veneer with a black grille. Biamp/biwire terminals are included. Price: $550 a pair. Sound Dynamics, Dept. SR, 3641 McNicoll Ave., Scarborough, Ontario M1X 1G5. *Circle 134 on reader service card

**BANG & OLUFSEN**

The AV 7000, an add-on surround processor/amplifier for B&O audio systems, features a Dolby Pro Logic decoder, a 60-watt center-channel amp, and a code converter that enables B&O remote equipment to operate major-brand video components. Price: $1,995. Bang & Olufsen, Dept. SR, 1150 Feehanville Dr., Mount Prospect, IL 60056. *Circle 137 on reader service card

**TEAC**

Teac's R-550 is a two-head auto reverse cassette deck featuring a center-mounted transport, Dolby HX Pro headroom-extension circuitry, Dolby B and C noise reduction, a record-mute mode that can automatically insert pauses between selections, program search, and a CD Sync mode for recording from a compatible CD player. The deck can be operated using Teac's unified remote control (not included). Price: $289. Teac America, Dept. SR, 7733 Telegraph Rd., Montebello, CA 90640. *Circle 135 on reader service card

**MB QUART**

Part of MB Quart's Nautic Series, the 6½-inch QM 160.19 coaxial speaker is engineered to withstand temperature extremes, humidity, and salt-water spray, making it ideal for use on a boat or in an off-road vehicle. It features a plastic frame, a stainless-steel grille, and a watertight crossover module. Price: $309 a pair. MB Quart, Dept. SR, 25 Walpole Park S., Walpole, MA 02081. *Circle 138 on reader service card

STereo Review  April 1994  17
Power Connections
I'm very satisfied with my surround-sound receiver, but I want to add more power by attaching an external amplifier. I'm confused by the labeling of the connections on the receiver's back panel. For the main channels there are two pairs of jacks marked "pre-out" and "power in"; for the center channel there is just one pair of jacks labeled the same way. How do I use all of these to do what I want?

HISNIAM MOHAMMAD Kalamazoo, MI

A Receivers and integrated amplifiers, whether two-channel or multichannel A/V models, consist of a front section containing the input selector, tape-monitor switches, tone-controls, and the like and a power (or "main") amplifier that produces enough output to drive speakers. The control section is the preamplifier, and it operates at what is usually called "line level," which matches the input requirements of the power-amp stage.

Often the preamp signal is simply fed internally to the power amplifier, but more and more models route the signal through a series of rear-panel jacks (usually labeled "pre-out" and "main-in") that are strapped together, frequently by U-shaped metal plugs, called jumpers, that simply connect the output and input jacks together, but sometimes using more elaborate plastic-encased plugs. When these jumpers are removed, you can insert another component, such as an equalizer, between preamplifier and power amplifier by connecting the pre-out jacks to the external device's inputs and connecting its outputs back to the main-in jacks (or, in your case, the "power-in" jacks).

Alternatively, if you want to leave the internal power amplifiers idle and use external amplification, you can feed the pre-out signal to the external power unit and leave the main-in jacks empty. The same is true for the center channel except that, being mono, it has only one of each type jack.

Schoo-Schoo CD's
Since my CD player was repaired, I have begun to hear a very annoying sound with several discs. In the play mode, I can hear the disc spinning with a cyclic "schoo, schoo... sound. I can sometimes get rid of it by pressing on the side or top of the player. It slows down and fades away as higher-numbered tracks are played. What could be causing the problem? Could it be causing damage to my CD's?

MICHAEL THIELANDER APO 09056, Germany

A You shouldn't be able to hear a disc rotating in your player. It sounds to me as if the CD is rubbing against something inside the player, so I would take it back to whoever "repaired" it and get the problem corrected. CD's can vary slightly in thickness, which is why only some of your discs make the noise; the service people probably tried your player with a thinner disc that had no problem. But if the rubbing is on the label side, it might eventually remove enough of the surface to let air in, which will oxidize the aluminum layer, possibly rendering the CD unplayable in the future. If the problem is on the playing side, it might create areas rough enough to disrupt the signal itself and cause skipping.

Ceiling Speakers
I was recently in a home that had music coming from the ceilings. It sounded quite good and seemed to come from all over the room. Is there any real advantage to this sort of system over conventional loudspeakers, and is the fidelity good enough to consider such a setup?

LEONARD SHEDLER Folsom, CA

A Mounting speakers flush with room surfaces can be an attractive alternative to big boxes sitting out in the room. While some of the speakers are designed for in-wall use are very good indeed, and these should work fine in a ceiling, avoid the typical ceiling speaker hidden behind one of those round metal grilles full of small holes that look like they would be good for draining cauliflower. As you noticed, however, it is very difficult to achieve proper imaging with ceiling-mounted speakers. That's why the sound seemed to come from everywhere. If you're mainly interested in background music, that may be okay, but it's almost never adequate for critical listening.

Phono Equalization
I recently added a turntable to my system and have a graphic equalizer I would like to use with it. The rest of my sources are fine without doing. Is there any way to route the output from my photo cartridge through the equalizer without affecting the other signals?

STEVE COLBURN Largo, FL

A One way would be to use an external phono preamplifier rather than the one built into your receiver (or integrated amp or separate full-function preamp). The signal would go from the cartridge to the external preamp to the equalizer to a line-
“Bipolar Systems are as Close as We’ve Come to Finding the Holy Grail of Home Theater.”

- Video Magazine

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Experts agree that Definitive's revolutionary bipolar BP8, BP10 and BP20 are three of the world’s finest speakers and are sonically superior to any conventional speaker regardless of cost.

These American-made, advanced technology bipolar (front and rear radiating) systems combine lush spacious soundstaging, lifelike depth-of-field, razor-sharp resolution and pinpoint 3-D imaging with powerful subwoofer-like bass (to below 20 Hz), high efficiency, wide dynamic range and easy-to-position convenience. The dramatic result is superb music and movie reproduction so real that it has been called, “a sonic miracle!”

The Ultimate Home Theater
Combine the BP8s, 10s, or 20s with our C/L/R 1000 or C1 center channel and BP2 bipolar surround speakers for the ultimate in home theater sound.

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Definitive's remarkable new PowerField™ 1500 250-watt powered 15" subwoofer is now available ($995).

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level input on your receiver. Alternatively, you could insert the equalizer in a tape-monitor loop and use your receiver's phone preamp. When listening to LP's, you'd have to switch to the phone input and switch the equalizer into the circuit, not all that onerous a task, but you could listen to them without EQ if you wanted to.

**Double-Duty Amplifier**

*Q* My Dolby Pro Logic decoder provides a single center-channel line output and a single subwoofer output as well. Could I use an ordinary stereo amplifier to drive a center speaker and a subwoofer? Would it provide adequate channel separation?

*JOE MORGAN* Kuwait City

As long as the amplifier has enough power to drive the subwoofer without distress, you should have no problem. Channel separation should be much more than enough.

**TV Speakers as Center Channel**

*Q* I would like to use the speakers in my television monitor for the center-channel signal when watching movies, but I have tried every connection I could think of between my AV receiver and TV monitor and still can't make it work. Is what I want to do possible?  

*JOEL STALEY* Schererville, IN

As long as you are not feeding your monitor's antenna terminals there should be no problem making the connection. Connect the output of your VCR to the TV's video line inputs and the line-level center-channel output of your receiver to the corresponding audio input (or inputs) on the television. If the receiver doesn't provide line outputs, you can often simply use the center-channel amplifier output itself. Run a length of speaker wire from the center-channel terminal on the receiver to the back of the TV and splice it to a short piece of cable with an RCA plug at the end. If you can switch your TV to mono operation, do so; if not, add a second RCA-terminated cable in parallel.

With the center-channel amplifier level fully off, plug this arrangement into the set's audio inputs. Using the test signals provided by your receiver, gradually bring up the level of the center-channel to match that of the other channels. You may have to juggle receiver-vs. television levels to minimize distortion and noise, and it may be advisable to "pad down" the center-channel output using a simple volume control to prevent overload of the television's inputs.

Such an arrangement should work, electrically at least, but remember that it is important for the tonal balance of the center-channel speaker to match that of the main speakers as closely as possible so that sound doesn't change character as they move about the soundstage. That may be difficult to achieve using your TV set's speakers.

You may also find that they run into distortion much more readily than your main speakers. In short, you would almost certainly be better off getting a good separate center-channel speaker that is well matched to your front left and right speakers.

**Inaudible Surround**

*Q* My Pro Logic receiver's surround-channel level control provides 36 db of attenuation, but only 6 db of boost. At +6 db I can just barely hear the surround speakers even with the front speakers off. None of the service people I have talked to know why so little range is offered, but I know it's not enough for proper surround sound. Is there any way I can increase the rear level?  

*CALVIN B. HASKELL* Elio, ME

The level controls for the surround and center channels built into Pro Logic decoders are there to enable the extra channels to be balanced with the main front pair, and that's usually a fairly minor adjustment. In your case, it sounds as if there's a substantial mismatch, which might be caused by using very sensitive speakers in the front and unusually insensitive ones in the rear. If your main speakers were capable of, say, 96 db output from a 1-watt input (very sensitive), and your surround speakers could put out only 84 db (quite insensitive), the 12-db difference would be impossible to equalize with your receiver's level controls. Even so, the difference would probably not be as dramatic as you describe, so I suspect you may have an equipment fault or a wiring problem. But before you head to the service shop, try balancing the levels again using the receiver's built-in test signal. If that works, you probably have nothing to worry about. Output from the surround speakers is often low much of the time when playing actual program material.

**CD Pinholes**

*I have noticed that there are tiny pinholes visible in some of my older CD's, but not in more recent CD's. Is what I'm seeing some sort of CD deterioration that happens with time? Should I start replacing my older discs?*

*JOHN WILSON* Campbellsville, KY

Pinholes, or tiny manufacturing flaws in a disc's reflective layer, were more common in the early days of the CD, but they still occur from time to time. They don't represent wear or deterioration of your discs; however, and are usually small enough to be dealt with easily by a player's error-correction system. So unless some of your older discs are audibly flawed, you can put your wallet away.

If you have a question about audio, send it to Q&A, Stereo Review, 1633 Broadway, New York, NY 10019. Sorry, only questions chosen for publication can be answered.
At Under $300, Definitive DR7s are Absolutely Incredible!

"...it is the best sounding speaker that I have heard in my home selling at anywhere near its price."

-Julian Hirsch, Stereo Review

Two of the world's most extraordinary speakers!
Julian Hirsch of Stereo Review raved that the DR7 Bookshelf is simply "remarkable" and "...usually outperformed speakers priced as much as two or three times higher." Peter Moncrieff of JAR concurred that the DR7 Tower is absolutely "incredible."

Priced under $249 ea. (DR7 Bookshelf Monitor) and $299 ea. (DR7 Studio Tower), these extraordinary handcrafted loudspeakers have breathtaking three-dimensional imaging, dynamic lifelike clarity, natural musicality, astounding bass, and elegantly sleek designer styling which make them simply the best value in the history of hi fi.

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Advanced technology and superb components, like cast basket drivers, transmission line bass tuning, low diffraction monocoque cabinets and Linkwitz-Riley crossovers, all help. But most importantly, we hear very well and we care.

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CIRCLE NO. 15 ON READER SERVICE CARD
Recording on a Home Computer  BY DAVID RANADA

Most owners of sound cards for IBM-type computers use them for computer-game sound effects or music reproduction. But if you want to go one step further than that, you might consider using a sound card for recording and editing audio signals.

Practically any sound card provides that capability, either through software bundled with it or a third-party program. Normally, you feed the analog signal you want to record to the card. The audio signal is converted to digital format by the card’s internal analog-to-digital converters (ADC’s), and the digital data are “recorded” by storing them on the computer’s hard drive as sound files (*.WAV files in Windows). For playback, these sound files are fed through the sound card’s digital-to-analog converters (DAC’s).

A 16-bit sound card can produce files that are numerically equivalent to the data the same input signal would have produced had it been fed, say, to a DAT recorder. A good sound card can thus bestow on your computer high-quality audio recording capabilities: very flat frequency response, no wow or flutter, inaudible distortions, and a dynamic range near or equal to that of a CD.

Not only that, but a good waveform-editing program can give you sound-manipulation capabilities that are unheard of with old-fashioned razor-blade/splicing-block open-reel tape editing, impossible with cassette-tape formats, and only distantly approached, for now, by the editing features of MD.

Those capabilities were so attractive that I started looking for a sound card that allowed not only hard-disk editing but also direct digital-audio input and output using the standard consumer-format digital interface (SPDIF). Why is digital I/O important? So that I can edit live recordings made on a DAT machine and save the edited files on another DAT, all without additional cycling between the analog and digital “domains.” Digital output also allows me to generate, using very simple programs written in Basic or C, highly specialized, digitally “pure” test-signal files that can be digitally transferred to DAT or recordable CD (CD-R) for equipment testing.

My search for IBM-compatible sound cards with digital I/O has produced only one candidate, but it is an outstanding one: the CardD Plus ($795), which has SPDIF capability only when used in combination with the companion I/O CardD ($295), both from Digital Audio Labs (14505 21st Ave. N., Suite 202, Plymouth, MN 55447). The company also offers three sound-editing programs, ranging from Fast Eddie at $199 to the EdDitor Plus at $349, and it is bringing out an SPDIF card without ADC’s or DAC’s, the $495 Digital Only CardD, for pure-digital operations.

To use the CardD and EdDitor Plus, you must have a rather powerful IBM-type setup: at least a 386/33 or 486/33 processor, 4 megabytes of RAM, a 200-megabyte IDE or SCSI hard drive, a mouse, and Windows 3.1. The CardD doesn’t have audio-synthesis capabilities, so for MIDI work you also need an MPU-401-compatible card. There are a few other hardware-compatibility considerations involving SCSI hard-drive controllers that may or may not be relevant to your computer (check with Digital Audio Labs). And since just 1 minute of 16-bit stereo recording produces a huge sound file (around 11 megabytes), the larger your computer’s hard disk, the merrier.

With this equipment, you can perform the following operations:

- Cut-and-paste editing, for inserting or deleting specific sound segments with millisecond accuracy.
- Variable crossfading between edited segments for very smooth “splices.”
- Post-recording fading and other special effects, including reversal (playing a segment backwards), all-digital tone control, variable-speed playback, and mixing of sound files.
- Tape-like “scubbing” (EdDitor Plus only) to find a precise edit point.

All of these operations are greatly simplified by the mouse-controlled on-screen display (see the photo of an EdDitor Plus screen at left).

I’ve put these sound tools to good use already by making test signals and editing live DAT recordings and demo tapes. The system’s digital output (coaxial only) feeds without any trouble to CD-R, MD, DCC, and DAT recorders. I highly recommend the CardD system to avid amateur recordists. It will enable you to produce professional-sounding results with unusual speed and ease.

A recording edit in progress using EdDitor Plus.
Definitive's Award-Winning Center Channels and Bipolar Surround Speakers for Your Ultimate Home Theater

Absolute sonic superiority and unequalled value make Definitive loudspeakers your obvious choice.

Enthusiasts and world renowned experts acknowledge the dramatic sonic superiority of Definitive loudspeakers for both the superb reproduction of music and the dramatic special effects and dialogue of home theater surround sound.

World's Finest Center Channel Speakers

Optimum surround sound reproduction places heavy demands on the center speaker, the most important speaker because it handles 50% or more of the program material. It is no place to settle for second best. Definitive's C/L/R 1000 and C1 are the finest shielded, low profile, high resolution center channel/main speakers available. They use superior state-of-the-art components and technology for extraordinary ultra high definition articulate clarity and high power handling (C/L/R 1000: 300 watts, C1: 200 watts).

The BP2's Bipolar Advantage

BP2s are unique ultra compact high resolution bipolar (front and rear radiating) systems intended primarily for use on the rear/side surround channels of the finest home theater systems. Experts agree that Definitive's bipolars provide a perfectly diffuse sound source which is ideal for these applications. The use of BP2s results in a much more lifelike, dramatic all-enveloping listening experience than is possible with conventional speakers. In addition, because of their superb performance characteristics, the BP2s also make exceptional main channel speakers.

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Definitive speakers are consistently top-rated and were chosen by experts in Stereo Review for their home theater "Dream System." A survey of U.S. dealers voted Definitive speakers #1 for quality and reliability among all speakers sold in the U.S.!

Visit your nearest Definitive dealer today and hear why our superior sounding loudspeakers have won the industry's most prestigious honors, including the CES Design & Engineering Award, Video Magazine's ViVAl Gold Product of the Year Award and the AudioVideo Grand Prix.

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Automobile Magazine found so many reasons to like Neon, they named it “Automobile of the Year.” And once you see your Dodge or Plymouth dealer, you’ll no doubt come up with your own reasons to drive one.

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Log On, Beethoven

The ways in which we receive information range from the modern to the antiquated. For example, I can log onto the Internet, that great global web of computer networks, and for the price of a local phone call browse through an electronic library in Sydney, collecting text, sound, and video files. On the other hand, I ride my bicycle to the corner market to buy a Gutenbergian copy (usually smudged and wrinkled) of the Miami Herald. Clearly recognizing that the former way of disseminating and retrieving information has advantages over the latter, companies big and small are racing to build their section of the Information Superhighway and preparing goods and services to be transported over it.

Construction of the superhighway is proceeding faster than anyone had imagined. Piece by piece, the road is beginning to take shape. Bell Atlantic and TCI plan to invest $15 billion in the superhighway, and Pacific Telesis has earmarked $16 billion. The number of electronic-mail (e-mail) users is projected to climb to 31 million next year, up from 11.7 million in 1992. The interactive-TV industry, worth a mere $681 million in 1991, is expected to snowball to $1.65 billion by next year, thanks to the recent legislative approval of VDT (video dial tone), which permits regional phone companies to deliver TV and video services over telephone lines.

Sony has formed a new company, Sony Computer Entertainment, Inc., and hopes to sell one million video games in its first year—but that venture will be a tiny fraction of the size of the publicly traded video-game giants Sega and Nintendo. Among the many superhighway ventures, AT&T has purchased a stake in Sierra Network, the developers of a cyberspace theme park in which subscribers will be able to play video games over the telephone network. Commenting on the investment, David Neylon, director of new business development for AT&T's consumer products division, said, "Entertainment is the Trojan horse that will lead people to the virtual community."

If that is true, it's easy to see why companies are scrambling to create video-on-demand and game-based interactive services. On the other hand, it's hard to figure out why so few builders of the superhighway have shown an interest in music. Could it be that passive music listening is destined to be lost in the entertainment traffic of the future? Or are the companies that control the flow of music simply too timid? When IBM and Blockbuster announced last year that they were exploring the possibility of storing music in a central database and making CD's in Blockbuster stores while customers waited, the initial reaction of the recording industry was one of derision. Since then, several major record companies have warmed to the idea, but only after exposing their fear of the new. If they think in-store music-on-demand is radical, then in-home music-on-demand, in which a customer would download an album directly into his home computer or CD recorder, must be inconceivable to them.

And yet, in the near future, when everything from games to groceries will be accessible from home terminals, the best hope for the survival of the music industry will be equal accessibility. Surveys show that 40 percent of the people who enter a record store leave empty-handed because they can't find what they want; huge music databases would overcome stocking problems. And the cost of electronically transmitting music would be dramatically less than the current shipping charges of about $3 per CD. What would happen to all the CD pressing plants? Easy—they could make recordable CD's. And retail record stores? They would become music databases.

In the 1970's, Disney sued Sony for selling video recorders, and movie studios verbally fire-bombed the first videocassette rental shops. Today, it's not uncommon for the revenue from the sale and rental of prerecorded videocassettes to boost a motion picture's total income by 50 percent or more. Today, wealthier and wiser, studios are clamoring to create video-on-demand. Similarly, record companies must realize that by logging on to the superhighway they'll be able to compete for people's future entertainment dollars more successfully—and increase their profitability.

Frankly, I'm perplexed. Why does it seem that the telecommunications giants are overlooking music as new ventures are formed? Are they afraid to rock the boat of a prosperous industry? Do they fail to recognize the potential of tapping into new delivery systems, and the danger of not doing so? Right now there should be vigorous debate on a timetable for the completion of an on-demand music-delivery system, standards committees should be hammering out technical details, and consumer groups of music lovers should be watching over the proceedings to insure that fidelity is not compromised. But no. Some cable radio systems, some vague plans. No headlines. Other entertainment industries are racing forward, while the music industry sits still.

Is it possible? Could it happen? Like a deer frozen in the headlights of an onrushing truck, could the music industry wind up as roadkill along the Information Superhighway?
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Speaker Tests

A loudspeaker differs fundamentally from the electronic components of an audio system in at least one important respect: A single electrical input signal produces an infinite number of different acoustic outputs.

In the case of an amplifier, tuner, tape deck, or CD player, an input signal produces a corresponding (and, in general, unambiguously measurable) output signal, differing in some degree from the input in respect to level, distortion, and noise. If the component is well designed, the aberrations it creates are minor and not audibly significant. The point to remember is that, for better or worse, each member of a listening group hears the same signal coming from a system's electronic components.

Loudspeakers are a uniquely different matter. In any group of people listening to a loudspeaker, no two of them are hearing exactly the same signal! Why does this situation exist? Basically, because every sound source (speaker, in this case) radiates its output in many directions, usually in varying degrees. The frequency response measured at any direction from the source will almost always be different from the response at any other direction. This condition exists even for measurements made in an anechoic (echo-free) environment, and it is exacerbated in a normal listening room by the numerous reflections from walls, floor, and ceiling before being heard. Both direct and reflected sound make a significant contribution to the overall sound quality, but they are measured by different methods that often produce very different results.

So how do we measure speaker performance? There is no universal testing standard for loudspeakers. There are accepted conventions for certain very basic measurements (impedance and sensitivity, for example), but all attempts to standardize frequency-response measurement, probably the most important measurement with regard to sound quality, have come to naught. The reason is simple: If the "frequency response" of a speaker is different in every direction, and if each manufacturer has his own idea of the optimum directional characteristics for his products (since these characteristics can have a profound effect on the final sound), how can one expect any manufacturer to agree to a measurement method that might discriminate against his speakers and favor competitive designs?

There are also very different philosophies among speaker designers regarding the comparative importance of the sound traveling directly from the speaker to the listener's ears and the reverberant "room sound" that is reflected a number of times from the walls, floor, and ceiling before being heard. Both direct and reflected sound make a significant contribution to the performance of a loudspeaker, yet the measurement "ear" is a Bruel & Kjaer equipment more than thirty years ago, whose frequency response into a 2π solid angle (180 degrees) was measured for us by Acoustic Research. Knowing the true power response of these speakers in open air (placed the same way as most of the AR-LST speakers (a classic of yesteryear) whose power response into a 2π solid angle (180 degrees) was measured for us by Acoustic Research. Knowing the true power response of these speakers in open air (placed the same way as most of the speakers we test), we are able to correct for the losses between 10 and 20 kHz that result from room absorption.

We have found that the warble-tone room measurement of a pair of speakers yields response curves that typically vary from ±5 to ±8 dB at middle and high frequencies (much more at low frequencies, where this method becomes unreliable). By averaging the two curves and applying the high-frequency correction we obtain a composite curve that experience has shown to be a reasonable representation of how the speakers can perform at middle and high frequencies in a more or less typical listening room. Notice that I say "can" not "will," but my experience has been that the inherent characteristics of a speaker's power response and sound do appear in this curve and that it usually correlates quite well with the speaker's general sound quality in actual use.

Next month I will continue with the other tests we make on speakers.
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**ARMY. BE ALL YOU CAN BE.**
The Critics Love Ensemble And Ensemble II. What's The Difference, Anyway?

Cambridge SoundWorks changed the audio world when we began direct-marketing Ensemble* by Henry Kloss. Ensemble is a revolutionary dual-subwoofer/satellite speaker system offering all-out performance, without cluttering up your room with huge speaker cabinets. Available only factory-direct from Cambridge SoundWorks, with no expensive middle-men, Ensemble is priced at hundreds less than it would have sold for in stores. Audio magazine says Ensemble "may be the best value in the world."

And Then There Were Two.

Now Cambridge SoundWorks has introduced Ensemble II, a more affordable version of Ensemble using only one cabinet to hold both subwoofer drivers. Ensemble II has joined Ensemble in the ranks of the country's best-selling speakers. The real difference is in the subwoofers. We believe Ensemble II is a better system than its best-known competitor. And because we sell it factory-direct, it's half the price. Stereo Review said "Ensemble II performs so far beyond its price and size that it can be compared only with much larger speakers at substantially higher prices." We agree with the writer who said, "It's hard to imagine going wrong with Ensemble." The question is, which Ensemble system is right for you?

The Same Satellite Speakers.

When you listen to either Ensemble system, almost 90% of the music you hear is being reproduced by the satellite speakers. Both Ensemble and Ensemble II use satellite speakers that are virtually identical.* Unlike many competing systems, Ensemble's satellites are true two-way speaker systems, each containing a high performance tweeter and a 4-inch woofer. Stereo Review said, "The Ensemble satellites delivered a smoother output than..."
The Same Overall Sound.

In many rooms, Ensemble II sounds virtually the same as Ensemble, especially when Ensemble's two subwoofers are placed right next to each other. The real difference between the two systems is that Ensemble, with its two ultra-compact subwoofers (12" x 21" x 4 1/2"), gives you ultimate placement flexibility.

The Same Attention To Detail.

Ensemble and Ensemble II are constructed with the very best materials and no-compromise workmanship. Their subwoofers use heavy-duty woofers in true acoustic suspension enclosures. The satellites are genuine two-way systems with very high quality speaker components. Individual crossover networks are built into every cabinet for maximum wiring flexibility. Robust construction is used throughout. Featuring solid MDF cabinets and solid metal grilles.

The Same Factory-Direct Savings.

Cambridge SoundWorks products are available only factory-direct. By eliminating the middle-men, we're able to sell Ensemble and Ensemble II for hundreds less than if they were sold in stores.

The Same 30-Day Total Satisfaction Guarantee.

Choosing a loudspeaker after a brief listen at a dealer's showroom is like deciding on a car after one quick trip around the block. So we make it possible to audition our speakers the right way—

Stereo systems featuring Ensemble and Ensemble II speakers with Pioneer or Philips electronics start at only $799, including CD player. Dolby Surround Sound systems start at only $999.

in your own home. You get to listen for hours without a salesman hovering nearby. If within 30 days you're not happy, return your speaker system for a full refund. We even reimburse original UPS ground shipping charges in the continental United States.

Every Ensemble and Ensemble II comes complete with 100' of speaker wire, a wire cutter/stripper and our Guide To Surround Sound.

The Real Difference: The Ultimate Placement Flexibility Of Dual Subwoofers.

Placement of bass and high-frequency speakers in a room—and how those speakers interact with the acoustics of the room—has more influence on the overall sound quality of a stereo system than just about anything. As an alternative to spending hundreds (or thousands) of dollars on this or that "latest" amplifier or CD player design, you should invest some of your time experimenting with various speaker positioning schemes. Ensemble's two ultra-slim (4 1/2") subwoofers give you more placement flexibility than any speaker system we know of (including Ensemble II), and is most likely to provide the performance you want in the real world...in-your room.

How To Order.

The dual-subwoofer Ensemble system is available in two versions. With handsome black-laminate subwoofers for $599. Or with black vinyl-clad subwoofers for $499. Ensemble II is priced at $399. For more information or to order call our audio experts, 24 hours a day, 365 days a year. We'll send you our 64 page color catalog with stereo and surround sound components and systems from Cambridge SoundWorks, Pioneer, Philips, Denon and others. Because we sell factory-direct, eliminating expensive middle-men, you can save hundreds of dollars.

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Denon describes the new AVR-800 as a more affordable version of its higher-end audio/video receivers. The AVR-800 is a five-channel surround-sound receiver with three 60-watt amplifiers (for front left, right, and center speakers) and two 15-watt amplifiers for surround speakers. Its AM/FM tuner section has sixteen station presets.

Several surround modes are provided, including Dolby Pro Logic (with provision for a phantom-center mode when no center speaker is available). With a center speaker, there is a choice of Normal operation, which restricts the feed to the center to frequencies above 100 Hz (lower frequencies are shunted to the main left and right speakers), or Wideband operation if the center speaker has good bass response. The Dolby 3 Stereo three-channel mode is also provided (labeled Dolby 3CH) for use if there is a center speaker but no surround speakers. In that case, the surround-channel signal is folded into the left and right front outputs.

The AVR-800 also has circuits for enhancing the ambience of conventional stereo programs, with a surround-channel delay adjustable from 0 to 33 milliseconds (ms) in 1.5-ms steps (in Dolby Pro Logic mode, the delay range is 15 to 30 ms). The enhancement modes, designated Hall and Studio, differ essentially in the way the surround-channel signals are derived. In Hall mode, the sum of the left and right stereo channels is delayed; in Studio mode the difference between them is used.

There are audio inputs for phono, CD, an audio tape deck, a videodisc player or satellite receiver, and a VCR. There are also audio outputs for the VCR and audio tape deck, plus tape-monitoring facilities for the audio deck. Standard composite-video input and output jacks are provided for the VCR, as well as an output for a video monitor.

The AVR-800's front panel is not as formidable as those of many other A/V receivers we have seen and used. Most of its functions are operated by buttons in a single row below the display window. The logically grouped and clearly identified buttons include the controls associated with the tuner presets and several controls related to the surround modes.

Larger buttons on either side of the display window are used for tuning and input selection. A small Video button near the bottom of the panel sets up the connections for TV/FM simulcasts. The Panel button steps the display through the receiver's many adjustable settings (such as the level in each channel, delay times, etc.). An Output button silences all speaker outputs for headphone listening. The remaining front-panel features include the power button, headphone jack, volume knob, and three smaller knobs for bass, treble, and balance.

The display manages to be complete and informative without being confusing or overwhelming. When the tuner is selected, the band and fre-
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Best Of Dexter Gordon (Blue Note) 409/243
Ray Charles & Betty Carter (OCC Compart Classics) 376/293
The Divine Sarah Vaughan—The Columbia Years 1945-53 (Columbia) 374/20394/288
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Fatburger—The Best Of Fatburger (Manhattan) 440/842
GRP All-Star Big Band (GRP) 440/503
Wynton Marsalis—Septet—Blue Interlude (Columbia) 439/463
Al Jarreau—Heaven And Earth (Reprise) 439/240
Bob James & Earl Klugh—Cool (Wanger Bros.) 439/232
Miles Davis—Doo-Bop (Warner Bros.) 439/224
David Sanborn—Upfront (Elektra) 436/994
Horace Silver Quartet—It's Go To Be Funky (Columbia) 460/709
Dave Grusin—Homage To Duke (GRP) 468/471

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Fourplay refuses to rest on their laurels, they continue to create some of the most...
The AVR-800's rear apron contains a vertical row of audio input jacks, a separate group of video jacks, and connectors for the supplied AM loop antenna and either a 75-ohm or a 300-ohm FM antenna. There are outputs for the front left and right, center, and surround speakers and two AC convenience outlets, one of them switched. All of the speaker and antenna connectors are insulated spring clips that accept only wire ends. That precludes the use of banana plugs or coaxial F-connectors except through a matching transformer or adaptor.

Although the AVR-800 has relatively modest power ratings, it is a full-size, solidly built, and reasonably heavy receiver. As a result, it ran cooler than most A/V receivers we have tested. Its top cover becoming only slightly warm after extensive high-power testing.

Denon rates the center and surround power amplifiers for use with speakers of 8-ohm or higher impedance, the main channels for impedances as low as 6 ohms. The power specifications proved conservative, but the receiver is clearly not suited to driving 4-ohm speakers at high average levels, since the clipping-level output into 4 ohms was about 25 percent less than into 8 ohms. The short-term (dynamic) power into either 8 or 4 ohms was more than adequate, however.

The amplifier section's frequency response rose about 1.5 dB in the upper bass and lower midrange, with its maximum at 200 Hz. In surround operation, this characteristic affected only the left and right front channels. It was apparently an effect of the tone-control circuit, which also had some other peculiar characteristics. In particular, the first half of either tone-control knob's rotation, in either direction, had only a slight effect on frequency response (less than a 2-dB change), with almost all of the control's boost or cut occurring in the second half of the rotation.

The FM tuner section had generally good performance, about the same as most current receivers (including some priced well above the AVR-800), and its capture ratio and AM rejection were distinctly better than average. It was not possible to obtain meaningful total harmonic distortion plus noise (THD+N) readings from the tuner section in stereo because of the high level of 19-kHz stereo pilot carrier in the audio output. Our readings consisted largely of this leakage signal component, which is inaudible in itself but could cause problems during taping off the air if the recorder's input lacks an effective multiplex filter. The AM tuner's response was typical—meaning poor.

The Denon AVR-800 comes with a system remote control usable with a number of Denon CD players and tape decks. The remote duplicates all the receiver's essential controls, including the power switch, and adds a mute button and a test-tone button to help balance speaker levels in a surround system. A pair of Personal Memory buttons enables users to store and recall two different sets of surround-mode and input-source set-

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**TEST REPORTS**

**MEASUREMENTS**

**AMPLIFIER SECTION**

<table>
<thead>
<tr>
<th>Output at clipping (1 kHz)</th>
<th>Frequency response (tone controls centered) 20 Hz to 20 kHz ±1 dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>main, 8 ohms</td>
<td>86.5 watts</td>
</tr>
<tr>
<td>main, 4 ohms</td>
<td>62 watts</td>
</tr>
<tr>
<td>center, 8 ohms</td>
<td>95 watts</td>
</tr>
<tr>
<td>Clipping headroom (re rated output)</td>
<td>8 ohms 1.6 dB</td>
</tr>
<tr>
<td>Dynamic power</td>
<td>8 ohms 100 watts</td>
</tr>
<tr>
<td>Dynamic headroom (re rated output)</td>
<td>8 ohms 2.2 dB</td>
</tr>
<tr>
<td>Distortion at rated power</td>
<td>0.0322%</td>
</tr>
<tr>
<td>Sensitivity (for 1 watt output into 8 ohms)</td>
<td>30 mV</td>
</tr>
<tr>
<td>A-weighted noise (re 1 watt output)</td>
<td>-84.6 dB</td>
</tr>
<tr>
<td>Phono-input overload</td>
<td>-75 dB</td>
</tr>
<tr>
<td>Phono-input impedance</td>
<td>47,000 ohms in parallel with 160 pF</td>
</tr>
<tr>
<td>Tone-control range</td>
<td>100 Hz: +12.0.10 dB, 1 kHz: 105 mV, 20 kHz: 96 mV</td>
</tr>
<tr>
<td>RIAA phono-equalization error</td>
<td>20 Hz to 20 kHz ±1 dB</td>
</tr>
</tbody>
</table>

**TUNER SECTION**

| Frequency response (tone controls centered) 20 Hz to 20 kHz ±1 dB |
| For FM only except frequency response. |
| 50-dB quieting sensitivity |
| mono | 16 dB |
| stereo | 40 dB |
| Signal-to-noise ratio (at 65 dBf) |
| mono | 81 dB |
| stereo | 72 dB |
| Distortion (THD+N at 65 dBf—see text) |
| mono | 0.50% |
| stereo | 2.25% |
| Capture ratio (at 65 dBf) |
| AM rejection |
| 73 dB |
| Selectivity |
| alternate-channel |
| 63 dB |
| adjacent-channel |
| 7.5 dB |
| Pilot-carrier leakage |
| 19-kHz |
| -36 dB |
| 38-kHz |
| -50 dB |
| Hum |
| -76 dB |
| Channel separation |
| 100 Hz |
| 35 dB |
| 1 kHz |
| 35 dB |
| 10 kHz |
| 33.5 dB |
| Frequency response |
| FM | 20 Hz to 15 kHz ±0.2 dB |
| AM | 40 Hz to 2.7 kHz ±0.9 dB |
TEST REPORTS

programs sounded very good, and to
lection) easy and natural to use. FM
ter a brief familiarization period we
tening to CD's and FM broadcasts. Af-
basic four-speaker surround system,
set from the listening position.
and surround channels, which are best
rate level adjustments for the center
ings. The remote also provides separa-
the ear the tuner's sensitivity rivaled
that of some we have used that mea-
better. The Hall and Studio
modes provided good spatial enhance-
ment, with slightly but not signifi-
different sound characters.
The instruction manual for the
AVR-800 was quite complete though
not always easy to interpret. Very few
(if any) products as complex as an
A/V receiver can be used effectively
without a thorough study of their in-
structions and some hands-on practice,
and the AVR-800 is no exception. De-
spite its relatively simple appearance,
it is a full-featured component.
Although the AVR-800 is a rela-
tively low-price five-channel A/V re-
ceiver, neither quality nor significant
features have been sacrificed. You
may find more bells and whistles as
well as more power at higher prices,
but this receiver delivers the essential
performance required for home the-
ter and ambience-enhanced music
listening at quite a reasonable cost.

SECOND OPINION
Denon AVR-800 A/V Receiver

I was surprised by this receiver's
plainly un-flat response when its tone
controls were in their detented (thus
presumably "flat") positions. The same
response bulge occurred in two
different samples of the AVR-800,
suggesting either a deliberate design
choice or a parts-value mixup.
Fortunately, I found, the AVR-800's
response can be adjusted to near-perfect
flatness by turning both the treble and
the bass controls up to the second
"dot." I did all my surround-sound
measurements and listening tests with
the tone controls at these settings.
Once corrected in this fashion, the
receiver's Dolby Pro Logic response
was admirably flat, especially for the
main and center channels, which started
to roll off only at the very highest
frequencies (above 15 kHz). And the
surround channel didn't roll off in the
bass as much as usual. In another
unusual twist, the Hall and Studio
music-enhancement modes retain
Dolby B noise-reduction processing on
the surround outputs, in addition to the
7-kHz high-frequency rolloff applied in
Dolby Pro Logic decoding, possibly
dulling these signals unnecessarily.
All the other measurements of Dolby
Surround performance were pretty
much par for the course, neither
exceptionally good nor bad. I should
mention, however, that the spectrum of
the receiver's output noise was
admirably clean. There was no
contamination by power-line hum or
buzz, something that seems to be
occurring with distressing frequency in
audio products today.

The 2-db steps provided for
balancing the center and surround
speakers were a bit too coarse for ultra-
critical surround setup. I found no
settings that would enable all of the
AVR-800's channels to put out

SURROUND PERFORMANCE
Measurements are for Dolby Pro Logic only.

Frequency response
left, right ........................................... 20 Hz to 20 kHz +0, -0.8 dB
center ............................................... 20 Hz to 20 kHz +0, -0.4 dB
surround .......................................... 20 Hz to 7.3 kHz, +0, -3 dB

A-weighted noise
left, right ........................................... -76.0 dB
center ............................................... -75.6 dB
surround .......................................... -73.0 dB

Distortion (1 kHz, THD+N)
left, right ........................................... 0.030%
center ............................................... 0.026%
surround .......................................... 0.14%

Surround decoder input-overload levels (at 1 kHz)
left, right ........................................... +19.7 dB
center ............................................... +22.3 dB
surround .......................................... +20.2 dB

Surround-channel noise-reduction calibration error
at 1 kHz ........................................... +4 dB
at 3 kHz .......................................... +4 dB

Channel separation (100 Hz to 7 kHz)
left output, right driven ................................ >53 dB
left output, center driven ................................ >24 dB
center output, surround driven .......................... >38 dB
surround output, left driven ................................ >38 dB
left output, surround driven ................................ >30 dB
surround output, center driven .......................... >36 dB
center output, left driven ................................ >43 dB

Nonetheless, the AVR-800 did all that I
asked it to do sonically, including steer
Dolby Surround signals properly, with
no noise or distortion penalty.
There was little difference between
the Hall and Studio modes with music
except in the bass, which sometimes
sounded better with one setting or the
other, depending on the music. Both
provided an improved sense of
spaciousness, more effectively with
recordings that already had substantial
amounts of hall sound in the mix (like
most classical music). You might want
to lower the surround-speaker level
slightly from its ideal Dolby settings
when you use these modes. Neither
enhancement mode adds anything else
to the signal beyond the adjustable
delay, but at this price it's better to have
a couple of mild-mannered
enhancements than a multitude of
useless and exaggerated special effects.
Although the remote's buttons are of
monotonously regular size and layout,
except for the power switch they are
logically grouped and fairly well
labeled. The front-panel controls were
almost as easy to use, and the
fluorescent display is a model of
cross-the-room legibility.
With its operational simplicity and
fine sonic performance, the Denon
AVR-800 is clearly a good receiver for
someone who wants to get a start in
home theater.

—David Ranada
The purity of separates. From the passion of Carver.

The Carver name evokes an almost mystical following among serious music lovers.

And justly so. Carver power amplifiers have generated critical acclaim year after year, model after model, with one – the TFM-35 – universally acknowledged as "one of the best audio amplifier values in the world." Upgraded to the TFM-35x, with high fidelity enhancements so advanced, it also exceeded the strict specifications of THX® home theater.

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CIRCLE NO. 29 ON READER SERVICE CARD
In The Mid '70s We Now We've Created

The people who work at Cambridge SoundWorks - including our cofounder Henry Kloss (who also founded AR, KLH and Advent) - have been involved with the concept of home theater from the beginning. In 1969 (years before VCRs and cable TV), Henry Kloss founded Advent, the company that introduced the first home theater audio/video systems - complete with big-screen TVs and digital surround sound. We have had an ongoing relationship with the people at Dolby Laboratories, creators of Dolby Surround Sound, since Henry Kloss introduced the first consumer products with Dolby noise reduction over 20 years ago. And now at Cambridge SoundWorks we believe systems factory-direct, with no expensive middlemen, you can save hundreds of dollars. We believe the products on these pages represent the country's best values in high performance home theater components. Audio critics, and thousands of satisfied customers, agree. Stereo Review said "Cambridge SoundWorks manufactures loudspeakers that provide exceptional sound quality at affordable prices." Audio suggested that we "may have the best value in the world."

we have set a new price-to-performance standard for home theater components. Because we sell carefully matched and tested home theater speaker

Center Channel Speakers
Cambridge SoundWorks manufactures three speakers for use as center channel speakers in Dolby Pro Logic home theater systems. All three are magnetically shielded so they can be placed near a TV or computer monitor. Model Ten-A is a small, affordable two-way speaker. $75. Center Channel is identical to a

Our Surround Speakers
Cambridge SoundWorks Ensemble satellite (but with magnetic shielding). $149. Center Channel Plus uses an ultra-low, ultra-wide design that is ideal for placement above (or, with optional support stand, below) a TV monitor. $219.

Our Center Channel Speakers

Surround Speakers
Cambridge SoundWorks makes two "dipole radiator" surround sound speakers. Dolby Laboratories recommends dipole radiator speakers for use as surround speakers. The Surround has a very high power handling capacity and is often selected for "high end" surround sound systems. Audio, describing a system that included The Surround said "In many ways the surround sensation was every bit as good as far more expensive installations." $399 pr. The smaller The Surround II is arguably the country's best value in a dipole radiator speaker. $249 pr.

Our EXO-1 Electronic Crossover

Our Popcorn
Created Home Theater.
A New Way To Buy It.

Powered Subwoofers
The original Powered Subwoofer by Cambridge SoundWorks consists of a heavy-duty 12" woofer housed in an acoustic suspension cabinet with a 140-watt amplifier and a built-in electronic crossover. Stereo Review said it provides "deep powerful bass...31.5 Hz bass output was obtainable at a room-shaking level... they open the way to having a 'killer' system for an affordable price." $599. Our Slave Subwoofer uses the same woofer driver and cabinet, but does not include the amplifier or crossover. It can only be used in conjunction with the Powered Subwoofer. $299. The new Powered Subwoofer II uses a 120-watt amplifier with an 8" woofer. $399.

Our EXO-1 electronic crossover can be used with either of our powered subwoofer systems, or with powered subwoofers made by other companies. Its high pass filters keep strong, low bass signals out of the main stereo speakers, and directs them to the powered subwoofer. $299.

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We have assembled a number of home theater speaker systems that consist of center channel, surround and main stereo speakers. The combination we show here is our best seller. It includes our critically acclaimed Ensemble subwoofer satellite speaker system (with dual subwoofers), our Center Channel Plus and a pair of our best surround speakers, The Surround. You could spend hundreds more than its $1,117 price without improving performance.

For information on other home theater speaker systems - or on any of the products we make and sell - call 1-800-FOR-HIFI for your free color catalog. Thanks.
The Sherwood CDC-5030R is a five-disc carousel-type CD changer. Though as compact as many single-disc players, it provides a full complement of operating and programming features. Its disc tray emerges from the upper portion of the front panel at a touch on the adjacent open/close button. Above the tray is a row of small buttons for selecting the disc to be played. Four of the five disc wells are accessible at any time to load or unload a disc without disturbing playback of the fifth disc, which is in the playing position at the rear of the tray.

At the left end of the lower portion of the panel are the pushbutton power switch and a slide switch for setting up unattended operation of the player with an external power-line timer. At the right end of the panel are a stereo headphone jack and its adjacent volume knob.

The display window is below the disc tray, at the middle of the panel. In addition to the track-number indication, it shows the elapsed time on the current track and can be switched to show the remaining time on that track or on the disc. A “music calendar” shows the numbers of the remaining (unplayed) tracks on the current disc or in a programmed sequence. Five small circles along the bottom of the display show the numbers of the disc positions occupied by CD’s. Words appear as required to show the status of such special features as repeat or random play of one or all discs.

Despite its relatively simple, uncluttered front panel, the CDC-5030R has all the usual programming features as well as a few others not found on most CD players. In normal (unprogrammed) operation, it plays all loaded discs automatically in their numerical sequence, but it also enables quick direct access to any track of any disc. There are large buttons for play/pause and for stepping through the tracks on the current disc in either direction (with fast scanning when the button is held in for a couple of seconds). Other modes include repeat of a track, a disc, or all the discs in the tray. The random mode plays tracks or discs in random order, and intro-scan plays the first 10 seconds of each track on a selected disc or on every loaded disc.

The CDC-5030R can be programmed to play as many as thirty-two selections from any or all of the five discs in any desired sequence. A handy variation of this feature enables the user to delete as many as thirty-two selections from the playback sequence. A front-panel button reviews the programmed sequence. And to facilitate taping, the CDC-5030R can select tracks (up to a limit of thirty-two) that will fit best onto each side of a standard cassette.

The CDC-5030R has been designed to communicate with compatible Sherwood equipment through the Digi-Link jacks on its rear apron that can be connected to a Sherwood Digi-Link receiver or amplifier, which then controls the CD changer. And with a Sherwood Digi-Link cassette deck, it is possible to start recording from the CDC-5030R by pressing a single button. The back panel contains only the

**Sherwood CDC-5030R CD Changer**

**JULIAN HIRSCH • HIRSCH-HOUCK LABORATORIES**

**DIMENSIONS**

17¼ inches wide, 5 inches high, 15 inches deep.

**PRICE**

$275

**MANUFACTURER**

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We are pleased to announce three new products designed by our co-founder, Henry Kloss (founder of AR, KLH and Advent). Like all Cambridge SoundWorks products, they are high-performance components, well made, and finely finished. They are backed by our 30-day Total Satisfaction Guarantee. Because we sell factory-direct, with no expensive middlemen, you can save hundreds of dollars.

**Powered Subwoofer II.**
The **Powered Subwoofer II** consists of a heavy-duty 8' woofer in an acoustic suspension cabinet that also encloses a 120-watt amplifier and a variable, low-pass filter. You can add it to any speaker system for the ultra-low-bass response (primarily below 30 Hz) that is sacrificed for the sake of efficiency in all but the costliest of speakers. **Powered Subwoofer II** adds an extra “punch” to music and to movie soundtracks that is felt, as well as heard. $399.

**The Outdoor**
The natural, accurate tonal balance of speakers by Henry Kloss can now be enjoyed outdoors: on the patio, by the pool, even on boats. The **Outdoor** is a compact, weather-resistant speaker available in two versions: one free standing and one designed for in-wall mounting. Both versions can be used with their supplied white cabinet, or you can paint them. The **Outdoor** is a true high-fidelity loudspeaker, with wide-range, accurate sound. $279 pr. (Free standing version). $329 pr. (In-wall version.)

**Powered Ensemble**
This is the most recent addition to our popular series of Ensemble subwoofer-satellite speakers. It consists of a pair of our ultra-compact Ambiance two-way speakers, and our critically acclaimed Powered Subwoofer system (with 12" woofer, 140-watt amplifier and built-in electronic crossover). **Powered Ensemble** retains the smooth, natural tonal balance of our other Ensemble systems, but delivers deeper and more powerful bass response. Overall power handling and sound output capability is greater than in any other speaker system we offer. $999. (Speaker stands shown are optional.)

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Cambridge SoundWorks products are designed by our co-founder, Henry Kloss, who created the dominant speakers of the '50s (AR), '60s (KLH) and '70s (Advent). He is a member of the Audio Hall of Fame.

By selling factory-direct to the public through our catalog, we eliminate huge distribution expenses. Don’t be fooled by our reasonable prices. You too can conquer the fear of paying too little. Our products are very well designed and made.

Try any of our products in your home for 30 days. If you aren’t satisfied, return your purchase for a full refund. All our speakers are backed by a five-year parts and labor warranty. When you buy from Cambridge SoundWorks, there’s no risk.

Our knowledgeable audio experts (not clerks) are on call for advice, hook-up information, or orders, 8AM-midnight (ET) every day, including Sundays and holidays. Call 1-800-FOR-HIFI for your FREE color catalog at any time.
Our 64-page catalog is loaded with components and music systems from Cambridge SoundWorks, Pioneer, Philips, Denon, Sony and others. Because you buy factory-direct, with no expensive middle-men, you can save hundreds of dollars. For example, a Dolby Surround system with Ensemble I speakers, rear speakers, Philips Dolby Surround receiver, CD player and system remote is less than $1,000. Call today and find out why audio magazine said we "may have the best value in the world."

- Call toll-free for factory-direct savings.
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- Audio experts will answer your questions before and after you buy. 8AM-midnight, 365 days a year—even holidays.
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The changers come with a wireless remote control that duplicates most of its front-panel controls and provides at least two that are not on the player itself: an A-B repeat mode and direct access to index markers on a CD (if there are any). It also has up/down volume buttons that are functional for some other Sherwood CD players but not the CDC-5030R.

The CDC-5030R’s performance was typical of current CD players in most respects, which is to say it was generally very good. The player was fairly sensitive to impacts, such as moderate finger tapping on its top or sides, which caused momentary mistracking. The volume through the headphone jack was excellent.

Overall operation of the changer was straightforward, thanks to its very explicit instruction manual, which takes you step by step through each of its operating modes. Although its programming procedures are not like those of most other CD players we have used and can be confusing at first, a careful study of the instructions and some hands-on practice will pay rich dividends in your enjoyment of the CDC-5030R’s many operating features. It is a very practical, if somewhat unconventional, CD changer that delivers good performance and overall value at a modest price.
Why lower your expectations when it comes to in-wall speakers? It can be more than just a matter of convenience. Especially with PARADIGM in-wall speakers. Now you can get outstanding musical performance "from the wall".

What does it take to build the finest in-wall speaker? Quite simply, better design execution and better materials.

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Cinema DSP blurs the line between what

Yamaha Cinema DSP gives dialogue more definition. Music, more dimension. And sound effects, far greater realism, more graphic detail and superior placement. This breakthrough in realism is no small feat.

It's accomplished by multiplying the effects of Digital Sound Field Processing and Dolby Pro Logic.

Digital Sound Field Processing is Yamaha's unique technology that electronically recreates some of the finest performance spaces in the world.

While Dolby Pro Logic places sound around the room, matching the dialogue and sound effects with the action on the screen.

Together, these two technologies allow Yamaha to offer a complete line
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After reading this ad, if you get the feeling that watching a movie with Cinema DSP makes a world of difference, you're absolutely right.

But don't just take our word for it. Hear it for yourself. Stop by your local Yamaha dealer for a demonstration today. It's one demo that's bound to change the way you look at movies forever. Or at least for a very, very long time. For the dealer nearest you, call 1-800-4YAMAHA.
In corporate board rooms across America and the world the hottest topic is interactive multimedia. In the same way that a doctrine of Manifest Destiny expanded the United States to the Pacific in the 19th century, industrialists now believe that multimedia is inevitably the promised land awaiting them in the 21st century. This excitement is apparent in the mergers of cable companies that can bring interactivity into some homes, telephone companies that have access to virtually every home, and software companies. Perhaps no collaboration has been as prominent as 3DO Company, a partnership of Matsushita (the world's largest consumer-electronics manufacturer, parent of Panasonic and Technics), AT&T (one of the world's leading communications companies), Time Warner (a $12 billion software giant and the second largest cable provider in the U.S.), MCA (a motion-picture and music conglomerate owned by Matsushita), and Electronic Arts (a leading interactive-entertainment software company), all working together to bring interactive media and programming to consumers.

At its launch, 3DO was a company without products, revenues, or profits. Its aim was to design the hardware and operating systems for interactive multimedia products. In an unusual twist, 3DO Company's business plan prohibits it from manufacturing its own hardware or publishing its own software. Instead, it will license its inventions to software providers for a royalty and to hardware manufacturers at no charge. The company's goal, with the support of its partners, is to produce an interactive multimedia system that is as ubiquitous as the VHS VCR.

The first fruit of this enterprise is the Panasonic FZ-1 REAL Interactive Multiplayer. One glance at this inaugural product and you'll know its designers wanted it to be regarded as something very different from a conventional CD player. On the front of the plastic chassis is a disc drawer flanked by power and open/close buttons with corresponding red and green LED status panels. A nine-pin socket is used to connect the supplied control pad and will also connect future controllers such as keyboards, mice, and so forth.

The back of the player has composite- and S-video, left and right audio, and RF output jacks, plus a slide switch for selecting Channel 3 or 4 at the RF output. The back panel also has a thirty-pin socket—a high-speed input/output (I/O) expansion port for future peripherals such as personal computers, CD-ROM drives, cable boxes, modems, memory-card storage, video cameras and VCR's for home video editing, and MIDI instruments.

The right side of the player has a sixty-eight-pin socket concealed under a plastic panel; this is a high-speed A/V I/O port that will support a future FMV (full-motion video) adaptor cartridge. The cartridge will contain a hardware-based MPEG-1 decoding system that will enable users to play Video CD's containing as much as 74 minutes of digital video and stereo digital audio with quality comparable to that of VHS tape. On the left side of the player is the exhaust for an internal cooling fan.

The controller supplied with the FZ-1 will be more familiar to videogame enthusiasts than to audiophiles. It is a hard-wired remote that connects to the front of the FZ-1 with a 10-foot cable. One side holds a directional pad that provides up/down and left/right control; the other side has three buttons labeled A, B, and C. The

Panasonic FZ-1 REAL 3DO Interactive Multiplayer

KEN C. POHLMANN • HAMMER LABORATORIES
The all-weather Boston® Voyager thrives in the toughest environments (including the critic's listening room).

When it comes to the ruggedness necessary for indoor/outdoor use, most loudspeakers are about as helpless as a kitten up a tree. But not the Voyager speaker from Boston Acoustics. It brings impressive sound to your living room, patio or your Swan-53 custom-built sloop. In fact, Stereo Review says that Voyager "...sounds better than many highly regarded home speakers." Not an easy feat. Here's how we did it. First, the housing of the Voyager is made of Lexan® resin—the same stuff used to make bulletproof glass. So Voyager is tough enough to withstand anything this side of a small meteor shower. In front, the Voyager's grille is a highly resilient grade of stainless steel. So are its mounting bracket, hardware and screws. Its cone and tweeter dome are made of moisture-, heat- and cold-resistant copolymer. Even the speaker terminals are plated with 14K gold—a material that resists corrosion, and looks pretty darn snappy, too. Finally, to ensure that moisture on the outside of the Voyager stays there, we use specially designed gaskets to create a watertight seal. As a result, the Voyager actually floats. And there's more; the Voyager is part of a family of indoor/outdoor speakers, including the Runabout™ I and Runabout II. Both Runabouts feature the resiliency of a tough polypropylene enclosure, plus corrosion-resistant grilles, brackets and hardware. More importantly, they feature the Boston Sound—a sound that is tight, clean and smooth. But don't take our word for it. Check out the entire line of indoor/outdoor speakers at your local Boston dealer. But, please, bring your own Johnny Mathis records.

The Voyager is not only a rugged individualist. It's also part of a family, including Runabout I and Runabout II speakers.

The Voyager® Speaker. It Even Plays Misty.

Get a copy of Number, the cool music magazine from Boston Acoustics. Circle reader service number 9.
functions of these controls depend on the software of the disc that is loaded. In the middle of the controller are two small buttons for stop and play/pause, but because their functions can be changed under software control, they are also generically labeled X and P. Two buttons on the front of the controller are called shift keys; again, their function is software-controlled. The front of the controller also sports a nine-pin socket for connecting other controllers: Specifically, this port can accommodate as many as eight Daisy-chained control devices. The rear of the controller has a headphone jack and a thumbwheel volume control.

As you’ve probably realized by now, the FZ-1 is actually a computer in disguise. Although the system uses a very respectable 12.5-MHz, 32-bit RISC (reduced-instruction-set computer) central processor, it is characteristic of the 3DO architecture to take much of the performance burden off the CPU and distribute it among other, more specialized chips. Thus, the FZ-1 contains two proprietary graphics-animation processors able to render as many as 64 million pixels per second, with a theoretical maximum of 16 million different colors and 640 x 480-pixel resolution. There is also a proprietary audio DSP chip, a video processor, twenty-four DMA (direct memory access) channels, a memory-management unit, 3 megabytes of RAM, 1 megabyte of ROM, 32 kilobytes of static RAM with battery back-up, and a multitasking operating system. Every player contains a software-based video decompression system called CinePak to play back full-screen, full-color video at 30 frames per second, with quality suitable for cartoons and the like. As required by the 3DO standard, the FZ-1 employs a CD drive with a data-transfer rate of 300 kilobytes per second, twice that of conventional audio-only CD players. (Such drives are often called 300-speed drives.) Overall, the FZ-1’s technology is similar to that used in most other recently introduced videogame systems—Commodore’s Amiga CD 32, for example, uses a 32-bit processor and a double-speed drive.

To ease the chore of interconnection, the FZ-1 comes with a variety of cables and adaptors. You’ll find adaptors for phono jack to F-type video jack and F-type video jack to coaxial video jack, plus six phono cables for connecting audio or video. The player also comes with a sampler CD and the Crash ‘N Burn road-race CD. My review unit was packed with two additional titles, Shelly Duvall’s It’s a Bird’s Life and Meatloaf’s “Bat Out of Hell II: Back into Hell,” a music CD—all in all, an interesting assortment.

Lab tests of the FZ-1’s audio performance confirmed that it is more of a video-game machine than a high-end music playback device. Frequency response rolled off to -1.2 dB at 20 kHz, signal-to-noise ratio (S/N) was 83.1 dB, dynamic range (A-wtd.) 92.5 dB, and a very respectable 12.5-MHz, 32-bit processor and a double-speed drive.

Gathering a variety of different types of CD’s, I turned on the FZ-1 as well as my television and audio system. When playing music CD’s, the FZ-1’s controller provides all the basic transport controls, and the television screen displays a menu for operating other functions, such as mono or stereo playback selection, disc repeat, random track playback, and track-sequence programming. Moreover, these settings are automatically saved in memory and recalled whenever the corresponding disc is played. Other video displays show track number and elapsed time, as well as bar graphs for left- and right-channel audio levels. Unfortunately, because the FZ-1 has no numerical displays of its own, you must have the TV on to see which track you are cueing or playing.

Interestingly, the player’s music-playback firmware offers three different abstract video displays that generate shapes and colors according to the music being played. I found one of the displays (similar to a “Color Echo” program on the sampler disc) to be quite interesting. Passing on the Meatloaf, I settled back with a new recording of Philip Glass’s Itaipu and was transfixed by the abstract sights and sounds. Scriabin, a great proponent of chromaticism, would have loved this. CD sound quality was reasonable but not award-winning.

I also played “A Home Video Album,” a music disc with CD+G graphics. The FZ-1 correctly handled both the conventional music data and the still graphic images embedded in the subcode stream, drawing a new color cartoon image every 15 seconds or so. Although CD+G has not prospered in the country, the CD+G compatibility of such systems as 3DO and CD-1 might finally kindle some interest in this format. The FZ-1 also correctly played a Photo CD (which can store as many as a hundred digitized images of standard photographs), dis-
Ray Manzarek changed music. We’re making sure he doesn’t do it as often.

Ray Manzarek, co-founder of the Doors, keyboardist, composer, producer, Nakamichi aficionado. The MB-4s plays 7 CDs while the MusicBank Organizer stores their cases.

Place seven of Ray’s CDs in the Nakamichi MusicBank™ System and you’ll truly appreciate the sonic innovations of a legendary keyboardist and his preferred components. The MB-4s is significantly faster, quieter, and smaller than ordinary carousel players. Yet it costs about the same. Which, in a breakthrough Nakamichi CD player, may be the biggest breakthrough of all.
playing high-quality pictures on the television screen. The controller enables you to control Photo CD operations such as image select, pan direction, pan speed, rotate, mirror, and zoom. For the record, the FZ-1 does not support CD-EG (CD Extended Graphics) discs, nor does it play CD-I discs, Sega CD, or other CD-ROM formats.

I next turned my attention to the heart of the matter—3D0 discs. The multimedia industry is already well established with floppy- and CD-ROM-based computer games and programs, CD-based video games, and laserdisc-based arcade games. Companies often develop a program or game for multiple platforms; in particular, since the early 1980's, there has been a lot of porting of arcade games to CD-ROM for home use. Naturally, 3D0 has followed this trend, and many of the initial 3D0 titles are new versions of existing titles. For example, 3D0 titles such as Crash 'N Burn, Dragon's Lair, Space Ace, Lemmings, The 7th Guest, Battle Chess, Out of This World, John Madden Football, Mad Dog McCree, The Incredible Machine, and The San Diego Zoo Presents...The Animals are already classics on other platforms.

Crash 'N Burn from Crystal Dynamics, a road-kill combat racing title, comes with the FZ-1 player. This fantasy game lets you pick a driver, combat car, and racing track and compete against five other taunting, jeering, bullying drivers in a race to the death, launching and suffering attacks from laser guns, missiles, flame throwers, hellfire rotopguns, road mines, and plasma cannons—in other words, it is much like driving in Manhattan. The 3D0 version provides all the classic features, along with small-screen, low-frame-rate animated movies of the competing drivers. The control pad enables you to steer your car along the track, select and launch weapons, change driving perspectives, and so on. Sound and video quality are similar to that of CD-I titles. Speech, music, and sound effects are very convincing and generally free of noise and distortion. The video signal is clean, and color is quite good, but limited resolution is apparent through-

Many of the initial 3D0 disc releases are new versions of classic titles on other game platforms.

out—not especially bad, just about average.

The sampler disc that accompanies the FZ-1 contains several brief interactive programs, a program to help familiarize the user with the system, and advertisements for upcoming 3D0 titles. The programs help you learn the system and show off some of its capabilities. For example, there are Batman and Hanna Barbera cartoons that employ the built-in CinePak software-based video decompression system. The very limited action in the Batman cartoon enabled the system to perform well, with relatively few artifacts, but the somewhat livelier action in the Hanna Barbera cartoon appeared to stress the decompression system, leading to very distracting "blocking" effects on stationary areas of color. As with any recording, however, the quality also depends on the care taken in bringing the program to the final medium—in other words, any artifacts are not necessarily the fault of the FZ-1.

I also tried out It's a Bird's Life from Sanctuary Woods Multimedia Corporation ($54.95). It is a sixty-page interactive children's storybook based on a CD-ROM title originally developed for Macintosh and IBM personal computers. The 3D0 version is enhanced with extra games and a more flexible user interface. Using a series of cartoon stills and video overlays and effects, the disc tells a story involving Shelley Duvall and her "zany" pet birds. Again, the sound and video quality was similar to that of CD-I titles, with occasionally distracting video artifacts.

All three 3D0 discs required long waits for program loading. For example, Crash 'N Burn takes 35 seconds for its initial load and 20 seconds more to start a race. The sampler takes 25 seconds for its initial load and 50 seconds to load the cartoon menu. During these waits the screen simply goes black, sometimes abruptly cutting off an existing image. In contrast, a first-generation Philips CD-I player provided much faster loads, smoother fade-in and fade-out, and generally more polished operation. I was also unimpressed with the content of the 3D0 discs: I consider it a bad sign that, to me at least, the most interesting aspect of the system was the color display it could show on TV while playing music CD's.

On the other hand, with only three titles to judge from, it is difficult to draw even a preliminary conclusion about the FZ-1 or the 3D0 format in general. If these titles are the best that can be done, then the system definitely falls short of its considerable hype. Quality levels are about the same as for existing multimedia platforms, disc access times are long, and production values are merely almost as good as for CD-I. It is very possible, however, that these limitations are in the software and not inherent in the system itself. With dozens of 3D0 titles in the pipeline, only time will tell.

I hope software companies will do more than simply port existing programs to the 3D0 format. To survive in the intensely competitive multimedia CD market, with many incompatible systems available, a newcomer needs to do better than that. What the multimedia industry as a whole still needs is an individual of breathtaking creative vision. In the same way that Richard Wagner transformed opera and D. W. Griffith created modern cinema, a genius must seize upon existing multimedia CD systems and turn this technology into art.

Meanwhile, the corporate giants who control 3DO are pushing rapidly ahead. The FZ-1 lets you play games, look at photos, and listen to music. It will soon be accessorized to enable you to watch movies. The next generation of 3D0 products, due later this year, will bring electronic shopping and other interactive communications. Clearly, The 3DO story is not yet fully written.
You need the right tone of voice to say Home Theater

In a movie theater, the speaker you never see is the center channel. That's because it's located directly behind the screen, so dialogue sounds as if it's coming directly from the actor's mouths. Although movie screens have tiny holes in them to allow the soundtrack to pass into the theater, the screen material absorbs so much high frequency information that filmmakers are forced to boost the treble content of the soundtrack. Unfortunately when a film is transferred to videotape or laserdisc, this high frequency boost remains, resulting in dialogue that is unnaturally harsh and much too "up front" for home theater. While most speaker manufacturers design their center channel systems to be acoustically flat—a noble goal, they completely ignore the question of overly bright dialogue reproduction.

To overcome this problem, Atlantic Technology's Model 153 C Center Channel Speaker gently rolls off the high frequencies for smooth reproduction of center channel dialogue information. When designing the 153 C, our R&D team spent countless hours listening to a wide variety of film and television soundtracks. These tests allowed us to perfectly tune the Model 153 C for extended listening, without the brittle, misdirected and harsh sound often associated with center channel loudspeakers. The result is rich, natural sounding vocal reproduction. Simply put, the right tone of voice.

At Atlantic Technology, we specialize in home theater. We listen to our customers and to movies with equal excitement, then deliver components that are as much about value as they are about performance. That's why Video Magazine said "In its price range, Atlantic Technology is currently very hard—if not impossible—to beat."

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If you can name the movie the above quote is from, the character who said it, and the actor who played the role, you can be entered in a drawing to win our Center Channel Speaker. Send your answers on a postcard to Atlantic Technology, Contest Dept., 343 Vanderbilt Ave, Norwood MA 02062. Contest ends 3/31/94
Boston Acoustics Home THX Loudspeaker System

DAVID RANADA • TECHNICAL EDITOR

Boston Acoustics is among the most recent manufacturers to introduce a line of Home THX loudspeakers. As is typical of Home THX speaker systems, a full Boston Acoustics setup is made up of seven pieces: three controlled-directivity front-channel loudspeakers, two quasi-dipolar surround speakers, and two subwoofers handling the range from 80 Hz down, all certified to meet the strict specifications of Lucasfilm Home THX. The price, however, is not typical—$2,400 for all seven speakers, a new low for a complete Home THX speaker system.

(With the new Home THX receivers becoming available, it will soon be possible to put together a top-to-bottom Home THX audio system for less than $4,000.)

Boston's front speaker is the 555x ($300 each). Like most other Home THX front-speaker designs, it uses two tweeters (here, 1-inch domes) and two woofers (5½-inch copolymer cones) in a symmetrical vertical array. This arrangement is common because it is one of the easiest ways to obtain restricted (the manual says "focused") vertical dispersion over the frequency span specified by Lucasfilm.

Boston Acoustics gives the 555x's sensitivity as 90 dB sound-pressure level (SPL) with a 1-watt input. Crossover frequency is 3 kHz, and recommended amplifier power is 15 to 150 watts. A 555x measures 11½ inches wide, 18½ inches high, and 7½ inches deep. It is finished in a black-ash vinyl veneer. Like all Home THX front speakers, the 555x has a deliberate low-frequency rolloff below 80 Hz, as it is intended to be used with one or two subwoofers.

Available in white as well as the black-ash finish, the 575x surround speakers ($500 a pair) are quite compact (7½ x 11¾ x 4⅞ inches) and relatively lightweight (8 pounds). Each contains a single 5⅞-inch copolymer woofer crossed over at 350 Hz to a pair of 2¾-inch cone tweeters operating in a quasi-dipole configuration to radiate sound primarily along the listening-room walls. The 575x's rated sensitivity is 85 dB SPL; recommended amplifier power is 15 to 150 watts.

The design of the 595x subwoofer ($500 each) is, in contrast, very simple: a single 12-inch driver in an acoustic-suspension (sealed-box) enclosure. That box is relatively large (17¾ x 18½ x 18¾ inches) and heavy (53 pounds) and comes only in the black-ash finish. It has four rubber feet, so moving it around a carpeted floor is easier if it's turned on its side. Rated sensitivity is 85 dB SPL; recommended amplifier power is 100 to 250 watts, reflecting the amount of energy needed to reproduce action-movie soundtracks at theater-like levels.

To meet the stringent Home THX output-level requirements, Boston Acoustics recommends that two 595x subs be used in rooms with volumes greater than 3,000 cubic feet. You don't need a separate amplifier channel for each sub, however, since two can be hooked up in parallel to any output that can drive a 4-ohm load (rated impedance for all of these speakers is 8 ohms each). But driving each subwoofer from a separate amplifier channel may make it easier to obtain flat low-frequency response if the gains for the two channels are independently adjustable, especially if you place the subs asymmetrically in the room (more on that later).

Connections to all the speakers are via gold-plated multiway binding posts that can take dual banana plugs, stripped wires, connecting pins, or spade lugs. Although the fit is tight, you can get your fingers around the posts to tighten them securely, an advantage over the cramped connectors on some other Home THX speakers. The grille panels are removable.

The well-written, full-color system manual goes into detail about speaker hookup and placement. As I found, following its recommendations saves a great deal of experimentation. For example, after hauling the subwoofers all around the STEREO REVIEW listening room, measuring the results at different positions with pink noise, a calibrated microphone, and a multikilobuck spectrum analyzer, I ended up getting the flattest response by putting one of them precisely where the manual recommends, in a corner, and the other one along a side wall. Such an asymmetrical subwoofer arrangement usually promotes smoother-sounding low-frequency response by breaking up room resonances—an
The music deal to make green with envy.


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other strong argument for using two subwoofers.

Also take seriously the company's recommendations as to the height of the front speakers. At the very least, place the left and right front speakers with the centers of their grilles as close to the listener's seated ear level as possible. Slightly below or above ear level is okay, too, as long as the speakers are tilted to aim directly at the listener. Boston Acoustics recommends using stands between 24 and 30 inches high. I heard a slight, but noticeable, improvement in frequency balance as the amount of tilt necessary was reduced (that is, as the speakers were brought closer to the correct height), an effect that is probably attributable to the change in the vertical angle at which the speaker's direct sound arrived at my head.

The ideal for any center-channel speaker is to place it behind an acoustically transparent front-projection video screen, but most of us have to make do with something considerably less exotic. That means the center speaker will probably end up either above or below the picture tube of a direct-view set. Since the Boston Acoustics 555x is meant to be used vertically (the radiation pattern will be wrong if it is placed sideways), the company recommends placing the center-channel speaker below the TV screen, on a stand 6 to 18 inches tall, and tilting it to face the center of the listening area. The surrounds are best placed directly to the sides of the main listening positions and up on a wall (or on the ceiling, if necessary) 5 to 9 feet above the floor.

These speaker-placement recommendations might sound a bit restric-
tive, but they are no more so than those for any other Home THX speaker systems. Boston Acoustics has simply seen fit to make the guidelines for good performance explicit in its manual. Indeed, the manuals for all speakers, THX-certified or not, should give such specific advice to help users get the best possible results.

The sound I ultimately got out of the Boston Acoustics Home THX speakers was outstanding. They could play extremely loud, with my ears showing signs of distress before the speakers did. When the speakers were placed properly, their imaging, playing either soundtracks or music, was pinpoint accurate (depending, naturally, on the program material). Overall tonal balance was very neutral and mercilessly revealing of deficiencies in recordings of such critical sounds as voices, brass, and massed strings. Low bass remained clean even when loud, as in such demanding material as pipe-organ music or the submarine "flybys" in The Hunt for Red October. And, as I've noticed with other Home THX speakers, when playing music recorded in a natural acoustical setting (most classical music, for example), the Boston Acoustics speakers benefited noticeably from judicious use of a good digital ambience-enhancement system.

It all adds up to an excellent-sounding multichannel speaker system, suitable for high-quality reproduction of both soundtracks and music. The appeal of the Boston Acoustics Home THX speakers is only enhanced by their pricing, which, at least for now, is very much at the low end of the THX scale. For what they are and do, these speakers are genuine bargains.
Lucasfilm's approach to bringing the theater experience home

BY TOMLINSON HOLMAN

HOME THX is a set of techniques and hardware performance and compatibility standards that we have put together at Lucasfilm to address the long-standing problem of translating the intentions of movie and music producers into the home listening environment. To explain this, I often liken my job to that of a museum curator in charge of lighting paintings. For a Van Gogh I would choose warm light representing the Mediterranean sky under which he painted, but if the painting were a Rembrandt, a cooler light representing Northern European skies would be more appropriate. The point is to get the display to match the conditions that the artist used so that we can see his work as he did.

Such matching is difficult to achieve for most music recordings. The precise conditions under which the recording was mixed are seldom known; even if the monitor loudspeakers are credited in the album notes, you still don't know the acoustic conditions. Film sound is the only consistent exception. In film sound there are precise standards that, practically speaking, all studios adhere to: They all listen under nearly identical conditions. One reason for this uniformity is that all candidates for the Academy Award for Sound are judged in a single theater, with not even the volume changed from one film to the next, which acts as a great standardizing force in the motion-picture industry.

Today it is possible to make the soundtrack on a video release of a film audibly identical to the original masters. So for the best releases, the medium does not stand in the way of getting the sound in the home as close as possible to the original experience. It is in the rest of the sound system that the problems reside. Correcting the film sound, made under theater conditions, to match home listening conditions is one

Tomlinson Holman is corporate technical director for Lucasfilm and originator of both the theater and home THX programs. He is also on the faculty of USC, where he teaches courses in film sound.
Some components of a typical Home THX system: above, a Lexicon CP-3 controller ($2,995) and a Carver TFM-35x 250-watt-per-channel power amplifier ($800); on the walls, a pair of Boston Acoustics 575x surround speakers ($500 a pair); on top of the TV set, a Boston Acoustics 555x front speaker ($300), beneath it a 595x subwoofer ($500). The TV set is a 27-inch Toshiba CN-27C90.
Altec Lansing’s Home THX lineup consists of the three-way AHT2100 surround speakers (top, $900 a pair), which can be mounted in or on a wall, the AHT2200 front speakers (right, $300 each), and the AHT2300 powered subwoofer ($1,200).

The Fosgate Model Three A audio/video preamplifier ($2,799) uses proprietary analog and digital circuitry to deliver Dolby Pro Logic decoding and Home THX processing as well as additional surround modes for soundtrack and music playback.

Snell’s basic Home THX system: On pedestals in the foreground are two SUR-500 surround speakers ($899 each). Behind them, also on pedestals, are three LCR-500 front-channel speakers ($899 each), and to the right are two SUB-550 subwoofers ($549 each).

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But what was wrong with my home music system? The answer turned out to be that mixes balanced to film standards to sound right in the large acoustical environment of a theater will sound too bright when reproduced in the confines of a home listening room; a frequency-response correction is needed to get good results from program material mixed in one type of environment when playing it back in the other. The name we’ve given this process is re-equalization, because the program material was once equalized for one environment and is now being re-equalized for playback in another. (Equalization is used in all recordings, either explicitly by way of an equalizer or implicitly by the choice of microphones and their placement relative to instruments.) Fortunately, with everyone listening to essentially the same monitor and room response from one studio to another, there is a real standard in film sound, so we know better what
we're dealing with than we do with, say, CD's. That means accurate re-
equalization is possible, provided the soundtrack is transferred accurately
when the video release is mastered.

**Souping Up the Surround**

The idea for the second Home THX enhancement emerged from careful
listening to the sound in a dubbing theater. The surround speakers always
seemed to sound brighter than the three front screen channels (left, cen-
ter, and right), even though they were
adjusted technically to the same stan-
dard. As sounds panned from screen
to surrounds, they got quite noticeably
brighter. Through experiments I found
two causes for this effect. One was the
use of a multiple-loudspeaker array
for the surround channel. The mixing
of the outputs of the many surround
speakers reproducing the same signal
causes a timbre difference between
their collective sound and that of the
single speakers assigned to each screen
cannel. All those speakers are neces-
sary for coverage in a theater, but not
in a home, so this aspect of the prob-
lem is easily fixed by using just two
surround loudspeakers, which most
people already do.

But that alone is not enough. The
other reason for the relative bright-
ness of the surrounds was the frequen-
cy-response difference perceived be-
tween sound originating in front and
from the sides. With less “shadow-
ing,” or obstruction, of the sound field
by a listener's head, the side-arriving
sound is brighter. It is possible to
equalize this effect away, so that the
outputs of the front and surround
speakers have the same timbre. We
call this process timbre matching.

The third Home THX enhancement
also emerged from a question that arose in listening. With
a dubbing stage or home theater set
up for perfect balance between the left
and right surround speakers, and sit-
ting precisely on the center line, you
get a kind of middle-of-the-head ef-
tect from surround sound, like listen-
ing with headphones. Moving off the
center line causes the sound to jump
quickly to the closer loudspeaker.
Neither of these conditions is right for
surround sound, which should be
smoothly enveloping. I therefore
devised a method to take the single
mono surround channel provided by
Dolby Surround and turn it into two
channels through a process called
decorrelation, which eliminates this ef-

The Dolby Laboratories technologies
known as Dolby Surround (Dolby Stereo in
theaters) and Dolby Pro Logic are based on the
use of an amplitude-phase matrix to
encode four channels' worth of audio into two
tracks on two-channel stereo media and to
decode them back into four channels in the
home. Professionals call this a 4-2-4 matrix.
When we began work on Home THX in 1986,
there were many methods to decode matrix
recordings in the home. Our strong
preference was to use the same decoding we
use in production to monitor Dolby Stereo
mixdowns, and that is, for all practical
purposes, Dolby Pro Logic. This follows from
our basic philosophy, that home playback of a
movie can and should be made to sound like
it originally did to its producers. So Home
THX systems inevitably use Dolby Pro Logic
decoding as the foundation on which
everything else depends.

The latest development in film sound is to
provide not just two channels on the medium,
for decoding into four with Pro Logic (Home
THX controllers decorrelate the surround
outputs and extract the low bass for a
subwoofer, creating a total of six loudspeaker
cannels), but to deliver six discrete digital
channels, eliminating the Pro Logic
decoding. This is a major step in something
that might be called “spatial clarity,” a step
we believe is definitely the future of audio.
Often called 5.1-channel sound, because the
sixth is a limited-bandwidth dedicated
subwoofer channel, it is already available in
many theaters. It will come to the home in
1995 on laserdisc, later in high-definition
television (HDTV) broadcasts and perhaps
other media, as well.

Dolby's contribution to this process is a
low-bit-rate perceptual-coding scheme called
AC-3. Low-bit-rate coding is what makes
discrete multichannel audio practical,
because if linear PCM digital coding were
used, as on CD's, it would require far too
much space on the available media. AC-3 is
the basis for the 5.1-channel Dolby Stereo
Digital theater system and the companion
Dolby Surround Digital system that will be
incorporated in laserdiscs and HDTV. Home
THX audio systems are prepared for discrete
multichannel sound because the loudspeaker
and amplifier layout is the one they already
use, but new laserdisc players, television
receivers, VCR's, and decoders will be
necessary to take advantage of it.
The components of the Technics SC-TH200 Home THX system ($8,500): At front, from left, are the remote control, the SH-TX200 controller, and the SE-TX200 six-channel power amplifier (70 watts per channel). In back are the SB-TW200 subwoofer, the SB-TF200 front speaker, and the SB-TS200 surround speaker.

M&K’s MX-5000THX powered subwoofer ($2,195), far left, is built around two 12-inch drivers in a push-pull configuration for low distortion. To its right is the M&K S-5000THX front speaker ($950). Not shown is the company’s SS-500THX surround speaker ($1,450 a pair).

THX LASERDISCS

The latest manifestation of THX technology is in the THX laserdisc program, in which we follow the production chain through from the original film element to the finished laser disc. By tracking quality along all stages of the process (with the assistance of a special composite test signal we developed), we can assure that the finished discs represent the film better than is possible on any other video medium widely available to consumers. The program covers both picture and sound quality, and since THX laser discs adhere to production standards all along the way, we can make them more interchangeable (no need to alter the volume from disc to disc, for example). They play perfectly well on all systems, whether the systems are all THX, partially THX, or not THX at all.

Released titles include The Abyss Special Edition, Hotta, the Star Wars Trilogy, T2 Special Edition, and The Ultimate Oz. Among these in preparation are The Sound of Music, Oklahoma!, and South Pacific.

For the surround loudspeakers the goal is to create an enveloping sound field capable of reproducing spacious reverberation and ambience while still handling more obvious, specific surround effects. A really good surround system will probably go unnoticed most of the time; the biggest problem that I see with surrounds in both theaters and homes is a tendency to exaggerate them. The correct level of rect sound by changing its timbre, adding to the direct sound at some frequencies, subtracting at others. These additions and cancellations result from the changing phase relationships between the direct sound and the reflected sound with changes in frequency. Reflected sound inevitably travels a longer path to the listener than direct sound does, and if that difference corresponds to one complete cycle of a wave, the two sounds will be in phase and reinforce each other, whereas if the path-length differences add up to half the wavelength, the two sounds will be out of phase and at least partially cancel each other. (The cancellation is only partial because the reflected sound is almost certainly weaker than the direct sound.) Thus, our ability to “hear through to the source”—hear the timbre of musical instruments correctly, for example—is enhanced if we can keep at least some of the reflections small.

In Home THX we minimize undesirable reflections by deliberately shaping the dispersion of the front loudspeakers like an ellipse, wide in the horizontal direction but narrower vertically, thus reducing the effects of ceiling and floor reflections. By delivering a larger proportion of direct sound than reflected energy, we promote localization of on-screen sound and speech intelligibility. Actually, this sort of directivity turns out not to be unusual among high-end loudspeakers, many of which have had limited vertical dispersion for years, probably to accrue the same benefits we have found. Also, in multichannel systems we are not so very concerned that the front loudspeakers deliver all of the required tradeoff between localization, on the one hand, and envelopment, on the other, since that is one of the greatest compromises of two-channel stereo, and the surround loudspeakers can also provide envelopment (more handily, in fact, than can front loudspeakers).
surround will immerse an audience in a sound field without drawing attention to itself except when the program requires a strong, pointed surround effect, which does not happen very often. The power of such subliminal, ambient surround can readily be demonstrated by picking a passage with enveloping surround, reproduced at the correct level, and turning the surround speakers off in the middle: The sound will collapse dramatically into the screen.

Directionally speaking, the surround loudspeakers should produce surround sound—that is, sound that originates all around you, without any particular preferred direction. A variety of loudspeaker that will achieve this aim is the dipolar type, but oriented in an unusual way, with the main lobes radiating forward and back and the null of its radiation pointed at the listener. Thus, what we hear is not the direct field of the loudspeaker but rather its radiation at all angles reflected by the room, adding greatly to the spatial sensation.

To enable both conveniently sized loudspeakers and strong deep-bass reproduction, Home THX systems normally incorporate one or more subwoofers. Most of them, in fact, require subwoofers for adequate performance at the lowest frequencies. Our principal concerns for the subwoofer are that it have the right frequency response to integrate well into rooms and that it have adequate output capability to handle film soundtracks. Let me suggest the following progression: Mozart, Beethoven, Mahler, Terminator 2. What we see (or hear, really) is a widening of the frequency and dynamic ranges, increasing spatial effects, and a downward movement of the frequency range in which the acoustic energy is greatest. That is why the subwoofer’s output capacity is so important, and if it can handle movies, it can handle all practical musical sources.

**Matchmaking**

The last major issue that we address in the Home THX program is making sure that all the components of a system work properly together. Traditionally, audio consumers have been left to fend pretty much for themselves with regard to such matters as amplifier gain, speaker impedance and sensitivity, power requirements, and so forth, which can vary quite sig-
A legitimate question people have raised is whether Home THX systems are good for music as well as film sound. Insofar as the re-equalization, timbre-matching, and decorrelation processes are concerned, these are all switched out for two-channel music playback because re-equalization is relevant only to film sound and the others only to surround sound. We require Home THX controllers to have a two-channel stereo mode in which the left and right source channels are unprocessed except for extracting the low bass to send to the subwoofer channel. So there is no issue with the electronics in two-channel stereo.

Our loudspeaker standards require good performance in all the usual respects—flat frequency response, low distortion, and so forth—so there is really no debate about the suitability of the left and right loudspeakers on this basis. What concerns some people is the very thing that makes these speakers distinctive—their vertical directivity. Although the front speakers have quite wide dispersion horizontally, their vertical directivity is controlled to reduce ceiling and floor reflections and to deliver a greater percentage of direct sound to the listener. Reduction of ceiling and floor reflections permits better localization, speech intelligibility, and, believe it or not, depth in two-channel stereo recordings, so we feel this approach is beneficial to music reproduction as well as to playback of movie soundtracks and will serve well for both purposes.

THX CABLES

Recently a new category of Home THX component became available—THX cables. We established Home THX cable specifications for a couple of reasons. One was to promote the use of a multiconductor cable and connector for multichannel audio hookups. Some Home THX controllers and power amplifiers now enable you to plug six channels together at once instead of making six separate connections, provided you have the necessary Home THX interconnect cable. Second, we wanted to be certain that the impedances of the cables, especially loudspeaker cables, were well suited to their tasks. We had seen examples of systems using, for example, very low-resistance cable (such as auto-battery cable) in which the cable’s high inductance more than overwhelmed the low resistance, causing audible frequency-response errors. So, for example, THX loudspeaker cable must conform to strict resistance, inductance, and capacitance specifications and come with information on the maximum lengths that can be used without exceeding a very small response error at the speaker terminals.

That does not mean Home THX components can be used only in a complete Home THX audio system. A Home THX controller can be used to good effect with conventional loudspeakers, for example, or non-THX amplifiers, just as Home THX speakers and amplifiers might be used in a conventional surround-sound or two-channel music system. What we have tried to do, however, is to assure by means of the electronic and loudspeaker developments discussed here, together with stringent interface and quality standards, that a system consisting of controllers, loudspeakers, amplifiers, equalizers, and cables bearing the Home THX logo will enable listeners to hear movie soundtracks at home as nearly as possible the way the artists who created them intended.
As virtually every speaker manufacturer rushes to deliver "home theater" speakers to the marketplace, M&K amasses nearly twenty years of experience in the field—dating back to Hollywood screening-room installations in the 1970s.

M&K engineers have spent well over a decade studying the varied aspects of surround sound—including encoding and decoding; soundtrack recording; and the differences between reproducing sound in theaters and in homes.

M&K speakers excel in the reproduction of all source material. Accuracy, low coloration, pinpoint imaging, wide dynamic range, and deep-bass reproduction are all critical for music as well as film soundtracks. M&K Satellites and Subwoofers have been acclaimed for these attributes since the '70s.

And this is why M&K knows that any speaker that claims to be optimized for either music or film sound, one at the expense of the other, will never reproduce either one properly.

M&K Home Theater Systems

Conventional speakers make the music and effects on film soundtracks compressed and dull. But M&K's exciting dynamics and "quick" transients give you precise 3-D imaging and a lifelike presence.

M&K Satellites are timbre-matched, using virtually identical speaker drivers, crossovers, and frequency response, for a seamless 360° surround-sound performance. With an all-M&K home theater system, voices and effects do not change character when the sound moves from left to right or front to back in your room. Even if you are just adding an M&K subwoofer, front/center, or surround speaker to your present system, M&K's unique timbre controls allow you to "fine-tune" the sound of your new M&K speakers to achieve the closest possible timbre-match with your existing speakers—even if they are not M&Ks.

M&K Center Channel Speakers

Beware of inexpensive "center channel" speakers. In Pro-Logic, the center channel speaker is driven the hardest, and often reproduces as much sound as the left and right speakers combined.

Each one of M&K's six individually-available Satellites has exceptional dynamic range and high output to meet and exceed the tremendous demands of the center channel.

M&K Powered Subwoofers

Legendary for their massive output, exceptional detail, and articulation, M&K's thirteen internally-powered Subwoofers set the industry's standards for high-performance deep bass.

M&K's innovative Push-Pull Dual Driver subwoofers deliver a major improvement by virtually eliminating even-order harmonic distortion, and doubling efficiency (same as doubling amplifier power) with four times the output of single driver subwoofers.

Whether you choose our state-of-the-art Home THX Audio speaker system, an add-on set of surround speakers, or anything in between, no other speakers will give you the exciting performance, sound quality, flexibility and compatibility of M&K's home theater component speakers.
All Underground

R

on Woznock digs loud music. "Whether I'm listening to a CD or watching a Garth Brooks concert video, it just doesn't sound right to me unless the volume is halfway up and the walls are shaking," says the thirty-two-year-old resident of South Wilkes-Barre, Pennsylvania, an old mining town on the banks of the Susquehanna River. Trouble is, his evenings of unbridled self-indulgence came to a screeching halt seven years ago when he and his wife Susan started a family. Cranking it up past the baby's 7 p.m. bedtime quickly became a no-no.

Not about to surrender his most treasured pastime, Woznock, who is employed as an operations manager for a local distribution company, decided to go for broke and convert his cellar into a media room. "I thought it would be easier to contain the sound there, so I hired a contractor to dig out the basement and put in a concrete floor." The excavation work alone cost $8,000 because they had to dig down nearly 3 feet to allow for a 7-foot, 3-inch ceiling in the spacious 25 x 14-foot room.

"My wife and I and a friend did all the rest of the work—from framing to finishing," says Woznock, noting that it set him back an additional $5,000. "We ran dedicated lines for the power amps and used two layers of sheetrock." When the room was complete—an intensive three-week project—Woznock moved his stack of audio and video components from the living room to the cellar.

An avid fan of country music and classic rock, from BTO to Aerosmith, Woznock likes having plenty of A/V sources. His current arsenal includes a dusty Technics SL-D3 turntable with a Shure M24H cartridge (used for the occasional foray into nostalgialand), a Nakamichi CR-2A cassette deck, a Nakamichi CDPlayer2, which has an internal six-disc magazine and a single-disc drawer, a Sony MDP-333 combination laserdisc/CD player, and a Fisher FVH-5550 hi-fi VCR.

Although the combi-player is mostly for video, Woznock also uses it for a DJ setup at parties every now and then. But the Nak changer is his favorite component. "When you look at it, it doesn't look like a changer," he explains. "I like to play games with my friends—you know, pull out a CD and then the thing starts playing."

The next stop along the signal path is a Yamaha DSP-E300 surround-processor/amp, which is looped through an Adcom GFP-55511 preamp. The Yamaha sports a Dolby Pro Logic decoder, eleven movie and music modes, and a five-channel power section rated to deliver 15 watts per channel.

Primary power is furnished by two 200-watt Adcom GFA-55511 stereo amplifiers and a 75-watt Sansui B-1000 stereo amp. Operating in bridged mode, each Adcom feeds up to 600 watts to a power-hungry Infinity 9 Kappa Reference Standard tower speaker. The Sansui feeds surround signals to a pair of Realistic 8-inch full-range drivers mounted in the room's back wall.

Finally, Woznock uses the Yamaha's resident amps to drive a Polk Audio Mini Monitor for the center channel and a pair of wall-mounted Polk Monitor 4's deployed as "front surround" speakers above the Kappas.

The Infinity Kappas are Woznock's latest acquisition. He had not been particularly dissatisfied with his previous speakers, but when he happened to hear the Kappas, "I was blown away by their smooth natural sound."

Except for the 50-inch Hitachi 50UX7L rear-projection TV, Woznock's A/V gear is housed in a homemade oak and pine cabinet. All wiring is Monster Cable.

Woznock likes to think of his $11,000 system ($24,000 if you include room construction) as both a home theater and an audio system. But it's the theater mode that impresses friends the most. "People are amazed when I turn on Top Gun. It's exhilarating. We find ourselves waiting for movies to come out on video instead of going to the theaters. And my kids—seven-year-old Robert and four-year-old Ronnie Jr.—love it. They like watching concerts in surround as well as their own tapes. It's well worth the investment."

Like most A/V devotees, Woznock is already into his next upgrade. An Infinity Kappa Center Channel speaker to match his main Kappas and a companion Adcom GFA-53511 amp to power it are on layaway. Also on his list is a new pair of surround speakers, an S-VHS video recorder, and perhaps a subwoofer. Oh, and what about those loud, late-night movie and music sessions? "It's great," Woznock says with a chuckle. "You can barely hear the system up on the third floor."

—Bob Ankosko
NOTHING DEFINES AN INDIVIDUAL, A GROUP OR A COMPANY LIKE ITS ACCOMPLISHMENTS.

Introducing the Premier Optical Digital Reference System, the result of a passionate pursuit of performance.
Since its inception, Pioneer Electronics has been inspired by the dream of reproducing music with all the passion and integrity of the original performance. For four years, Pioneer has diligently pursued a goal no other manufacturer had ever accomplished: pure and natural sound quality in the car.

The Premier Optical Digital Reference System is the result of that pursuit. It is simply the finest system of advanced integrated audio components ever crafted for the automobile. But more importantly, it represents what is possible when a company dedicates itself to a quest for the absolute-best.

From the moment you first see the Premier Audio Commander, you get the sense the Optical Digital Reference experience is like nothing else. It gives you unprecedented, total digital control of the sound, including precision sound field correction and 31-band EQ adjustment. In fact, at your fingertips are more audio control capabilities than are found in many small recording studios.

Every component in this system has been meticulously engineered to provide the purest sound quality ever experienced in a car. For starters, an optical digital link provides a connection that's impervious to a car's electrical interference. Moreover, Pioneer engineers have extended the optical digital connection further than it has ever gone before—from the source up to the output stage of the power amplifier.

The Optical Digital Reference System introduces the first digitally-integrated, "pure" Class A amplifier, which gives the CD sound a lifelike quality uncommon to digital sampling. The system also includes speakers that apply performance technology from Pioneer professional drivers, as well as innovations developed exclusively for this system. In short, the Optical Digital Reference network makes absolutely no compromises.

It's not surprising that Pioneer would go to such lengths to realize a dream. Because Pioneer wants the same thing from a car entertainment system that you do. Sound that stirs the emotions. And now that Pioneer has realized its dream of making the Optical Digital Reference System, it's time for you to realize your dream of experiencing the ultimate car audio system for yourself.

For more information or the Premier dealer nearest you, call 1-800-PIONEER ext. 01.
Most of us regularly accept behavior from our TV sets and video monitors that is really distortion. After all, that's how TV is supposed to look, right? No way. If it looks wrong it is wrong: When video reproduction makes real-world images (as opposed to special effects) look unnatural, it is often the fault of the monitor. What we want is high-fidelity video to go along with our high-fidelity audio—the most accurate possible representation of the original image. That's what professional video monitors provide, and this article will discuss several common faults of home TV's and monitors with that standard as the reference.

Despite all the attention paid to it, resolution (picture detail, seldom ranks as a shortcoming in modern sets, except among relatively low-end models. The world has long been blessed with monitors providing enough lines of resolution, which nonetheless remains the most oversold video performance characteristic around (except possibly for the low-light, or “lux,” ratings of camcorders). Almost all the sets I've seen lately of moderate size (20-inch) and up have had more than enough resolution capability, when correctly adjusted, to do justice to the most demanding of common video program material: live network sportscasts and laserdiscs. By “correctly adjusted,” I mean with the contrast control turned down from its normally too-high factory setting and with the sharpness control dialed halfway up at most—some sets are better with it all the way down. (Turning down the contrast to reasonable levels will also extend the useful life of your picture tube.) So I'm going to ignore resolution for now. On to more fruitful areas.

Simple and Obvious Errors

One of the most common errors that passes as normal is for the apparent sizes of objects to increase with in-
TV sets vary enormously in picture quality. Here's how to separate the great from the good and the good from the merely mediocre.
creases in the overall picture brightness, as if the camera lens were zooming in and out slightly according to the amount of light in the scene. This misbehavior, called breathing or ballooning, is very common in direct-view (nonprojection) monitors.

Breathing is normally not very prominent. But with letterboxed movies, which have black bands framing the image at the top and bottom of the screen, the picture height will often vary obviously (see Figure 1)—something that certainly doesn't happen during film projection. Sometimes the effect is so severe that the picture almost bounces, especially when there are sudden, dramatic changes in the brightness.

Breathing is exacerbated by excessive brightness and contrast settings and becomes more difficult to control as screen size increases. Since breathing varies widely in severity among consumer sets, it is definitely something you should pay attention to when shopping. As with many of the other faults covered here, once you know what to look for you'll be seeing it practically everywhere.

Cross-color is what happens when the black-and-white portion of a video signal is misinterpreted as color. Then you get such effects as a colored moiré pattern on finely striped clothing. Except in such instances, this problem is not very conspicuous. It can originate at any number of steps along the video chain besides the monitor, even at the camera, and once it occurs no monitor processing can entirely remove it.

Cross-luminance, where the color portion of the video signal is misinterpreted as black-and-white information, is far more common and is responsible for the ubiquitous "dot crawl." Extremely annoying once you know what to look for, dot crawl is a regular pattern of fine dots moving upwards or along high-contrast edges. Monitors vary widely in their ability to minimize dot crawl. Only very few consumer sets reduce it to near invisibility; some are so bad that even low-contrast, broad expanses of color are somewhat stippled. Signals entering a monitor through its S-video (Y/C) connector are supposed to be immune from cross-color and cross-luminance effects, provided that such signal self-contamination hasn't already occurred further back in the signal chain.

Picture tilt is actually more common than you'd think it would be, since it is simply a tilting of the TV tube's supposedly horizontal electron-beam paths relative to the set's outer cabin.

The cause is improper (sloppy) alignment of the tube or its deflection coils. Tilting is easily spotted on the computer graphics displayed during news and sports telecasts, which often contain long horizontal lines near the top or bottom of the picture.

Overscan is what happens when the edges of a video image fall outside the visible portion of the picture tube. When comparing monitors, notice how each one handles the edges of the image. Some will show more of the scene than others. Too much overscan can lead to such things as captions and subtitles being cut off at the bottom. Excessive overscan is far less a problem now than it was several years ago because recent TV circuitry is better at maintaining the correct picture size as a set ages.

A Question of Color

TV manufacturers have paid both too much and too little attention to the color performance of their products. Various types of electronic processing to keep the reds red and the greens green have received most of the attention. In the meantime, however, color accuracy has suffered: The picture may look good (plausible), but it may not be accurate (true to the colors of the original image). There are technical standards for the color performance of video monitors that if adhered to would bring higher-fidelity color reproduction. Some of these standards have been in place since the beginning of color TV, and yet no consumer set at any price meets them.

But some monitors may still deliver better color than others. If you want to go after high-fidelity video—so that the image you are seeing is closer to what careful producers intend—there are some steps you can take short of buying yourself a multikilobuck 19-inch studio monitor.

First, turn off, if you can, all controls in your set that are intended to maintain color "accuracy" automatically. More often than not such controls make most colors less accurate in order to keep flesh tones somewhat true (or at least close to what people expect to see). You can usually achieve better results with careful manual adjustment.

Deep, pure reds (like the reds you see in Christmas decorations) and deep, pure greens are very difficult for consumer monitors to reproduce. The reds usually come out slightly orange and the greens slightly yellowish. Differences among sets in red/green reproduction are most easily seen with a deep red or green coming into the picture. The bright turquoise (cyan) of shallow Caribbean waters is also difficult to reproduce, which is why it looks so much more vibrant when you see it in real.

Color temperature has recently become a much-discussed issue in monitor performance. Color temperature defines the precise "shade" of white a monitor produces when directed by a video signal to generate white. In a contradictory-sounding use of terminology, a high color temperature gives a "cool" bluish cast to all the colors in a picture, whereas a low color temperature imparts a "warm," or red/orange, bias (nowadays most sets are run at much higher color temperatures than the NTSC standard of 6,500° Kelvin). Large differences in color temperature are readily visible when switching between them on those high-end monitors that provide color-temperature selection. But the eye quickly—within seconds—adjusts to such differences, so correct monitor color temperature is really a concern only to true hi-fi video fanatics.

Warped Spaces

Geometric distortions encompass a wide range of problems, all of which
There’s Magic In Every Movie You Rent.
A Bigger, Better World Of Entertainment.
There's a revolution going on.

A revolution in entertainment. Art has combined with amazing advances in technology to turn imagination into reality. Virtually anything an artist can conceive can be made wondrously real. And Sony is leading the way.

Multi-million dollar soundtracks and spectacular state-of-the-art special effects have brought a whole new kind of magic to the movies. You see, hear and feel it every time you go to the movie theaters. Images you've never dreamed of dazzle your eyes. Sounds leap from the screen and swirl around you. You become immersed in an entertainment experience bigger and better than anything you've felt before.

Incredibly, all of this magic is right there in the videotapes you rent every day. The multi-million dollar soundtracks and the astonishing special effects are encoded on almost every videotape. Yet if you're watching only with an ordinary VCR and TV, you're not tapping into this amazing new technology. And you're missing out on so much.

Fortunately, there is a very simple way for you to unlock all this magic in your own home. And Sony gives you the key. The key to Entertainment to a Higher Power™.
Bring The Magic Home.
This is Entertainment to a Higher Power.

Home entertainment that unleashes all the wonder, all the joy, all the magic of today's movies, music and even sports. And puts it all in your living room. Art and technology, sights and sounds combined to give you a home entertainment experience bigger and better, more involving and more fun, than your TV set alone has ever been. And it doesn't have to be complicated. Or expensive. Sony makes it as simple as you want it to be. As simple as source, sound and sight.

Source. Start with a Sony HiFi Stereo VCR.

That's all it takes to immediately get much greater impact. Simply connect a Sony HiFi Stereo VCR to your current TV and stereo system. You'll be amazed how sound fills your room. What you're watching suddenly feels so much bigger than your TV screen.

Sound. Add a Sony A/V Receiver.

To take full advantage of the Surround Sound encoded on most videotapes and on many TV broadcasts, add a Sony A/V Receiver with Dolby® Pro Logic, and a few speakers. Bullets whiz past you. Footsteps sneak up behind you. Explosions rumble beneath you. Hollywood's magic comes alive all around you.

Sight. Get Bigger Impact with a Sony Big Screen TV.

Add a Sony Big Screen TV and plunge into wide open images. Advanced ProOptic™ technology and the unparalleled Trinitron® picture tube give you images so large and so clear, you're no longer just watching the action, you're part of it.
Sony gives you not only the basic building blocks for home entertainment, but easy-to-use innovations that take your entertainment experience above and beyond, as well. And, no matter what you choose—from the simplest set-up to the most sophisticated system—Sony’s innovative solutions make the ultimate entertainment experience easy and uncomplicated for any member of your family.

**Instant Surround Sound.**

It works with your TV and HiFi VCR and it’s the simplest way to a total entertainment experience.

The Sony SA-VA3 Theater Sound System gives you full Surround Sound with front, center and rear channel speakers, subwoofers and Dolby Pro Logic amplification—all in just ten minutes set-up time.

---

**Home Entertainment Profile.**

Take a moment to answer these questions and let us help you analyze your Home Entertainment needs.

1. What kind of VCR do you own?
   - MONO
     Star by upgrading to a HiFi Stereo VCR, go to question 2.
   - HiFi Stereo
     You’re in great shape, go to question 2.

2. What size is your main TV?
   - 20" or smaller
     Upgrade to a larger TV, go to question 3.
   - 25" or larger
     Consider upgrading to a larger TV, go to question 3.
   - A Projection TV
     You’re in great shape, go to question 3.
**Total Control.**

The SRC-100 A/V Controller unites Sony compatible audio and video components into one simple system with one simple remote. It remembers how everything is connected. And turns on only what needs to be turned on. You want to watch that movie on your VCR? Press “VCR”. Press “Play”. That’s all. The A/V Controller automatically powers up all the right equipment in all the right modes. It even controls most cable boxes, making it easy for any member of the family to get the most out of a Sony A/V System.

**Ultimate Sophistication. Ultimate Ease. Ultimate Fun.**

With the wave of a hand, Sony has created a true breakthrough in system control.

It’s the Sony VisionTouch™ remote control. Like nothing you’ve ever seen before, the one-button VisionTouch controls every function of a Sony home entertainment system through easy-to-understand displays on your TV screen. You’ll find it in Sony’s most advanced A/V Receiver, in the ES Series of ultra high-fidelity components.

---

**Is your Audio System:**

- **IN A DIFFERENT ROOM THAN THE MAIN TV?**
  - Move it to the same room and connect it to your TV and HiFi Stereo VCR.
- **IN THE SAME ROOM AS THE MAIN TV?**
  - Connect it to your TV and HiFi VCR, go to question 4.
- **I DON’T OWN ONE. PROCEED TO QUESTION 5.**
  - Purchase a system with a Dolby Pro Logic A/V Receiver.

---

**Does your Audio System consist of:**

- **A STEREO RECEIVER AND TWO SPEAKERS?**
  - Consider upgrading to a Dolby Pro Logic A/V Receiver and adding three speakers.
- **A SURROUND SOUND RECEIVER AND FOUR SPEAKERS?**
  - Consider upgrading to a Dolby Pro Logic A/V Receiver and adding one speaker.
- **A DOLBY PRO LOGIC RECEIVER AND FIVE SPEAKERS?**
  - Don’t stop now, go to question 5.

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**Are you concerned that a home entertainment system is:**

- **COMPLICATED TO USE?**
  - Consider integrating Sony Audio Video Controller into your System.
- **TOO EXPENSIVE?**
  - Remember you can build your System one piece at a time.
- **DIFFICULT TO SET UP?**
  - Your Audio Video Salesperson can help you do it yourself, or in most cases, arrange for someone to hook it up for you.
Nothing we tell you can adequately describe the Sony Home Entertainment experience.

Remember the first time you listened to a Sony Walkman® Personal Stereo? You had heard music before. But nothing could prepare you for the amazing sound that seemed to fill your head. It changed the way people listen to music on the go. This will change the way you watch and listen to entertainment at home. Just visit an authorized Sony E3 dealer and look for this special display. Press a big, red button, sit back and enjoy the magic. It is Entertainment to a Higher Power. And it's only from Sony.

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SONY
Whenever you encounter the color-bar test pattern shown at right, you have an excellent opportunity to perform some critical adjustments of your TV set or video monitor. You’ll sometimes find color bars appended to prerecorded videodiscs or videocassettes, but they are most commonly found over-the-air or on cable at the beginning or end of a station’s programming for the day.

As the diagram shows, the color portions of the color-bar test signal comprise the three primary TV colors (red, green, and blue) and three pairs of those primaries (yellow = green + red, cyan = green + blue, magenta = red + blue). If you look at those regions of a TV screen with a magnifying glass, you’ll see (or should see) precisely these color-dot combinations activated. The two shades of white (100 percent and 75 percent—here shown as a light gray) are made up of red, green, and blue phosphors all turned on equally.

With just the two upper color portions of the color-bar signal, you could adjust your set for proper color reproduction. There are two problems, however. First, some sets cannot be adjusted for proper color-bar reproduction no matter what you do with their controls. I’d never buy or recommend a set that couldn’t even do color bars right, regardless of what else it did well.

The second problem is that you need a very deep blue filter through which to view the color bars while adjusting the tint (hue) and color (saturation) controls. That filter is very dark and very blue because it must filter out entirely the contributions made by the red and green phosphors. Should you come across such a filter (known by the photographic name of Wratten 47B), the procedure is pretty straightforward: Repeatedly adjust the tint and color controls until every surviving color bar (only four will be visible through the filter) is of equal brightness, not only with the others but throughout its own height, including the small segment at its bottom. (A suitable filter is supplied with Reference Recordings’ very useful REF-01 test and setup laserdisc, “A Video Standard.”)

Even without such a filter, a color-bar pattern can still be useful for adjusting contrast and brightness (which should be adjusted before adjusting the color controls anyway), but only if the color control on your set can be turned all the way off to get a true black-and-white picture. With the color off, the large uppermost portions of the color bars should form a steady left-to-right progression from white to dark gray. The long horizontal black bar at the middle of the bottom of the test pattern should be noticeably darker than the dark gray (formerly blue) bar at the upper right. Repeatedly adjust the brightness and contrast—the controls interact somewhat—until you get an upper-bar gray scale with seven distinct shades of gray.

Alternatively, or as a cross-check, the rightmost of the small, dark vertical bars near the bottom right of the screen should just barely be visible, and the two small bars beside it should both be the same shade of black, so that they look like a single wider bar. This method, using the small, dark bars, has the advantage of working at any setting of the color control.

After adjustment, remember that you have just calibrated your set to compensate for the characteristics of the source originating the color bars. You and the station are at the mercy of the various program providers when it comes to actual color performance. The classic musical South Pacific is pretented, for example, and never looks quite right.

You might occasionally encounter other test patterns. But, though they can be useful, they usually aren’t on long enough for a home viewer to draw any conclusions or make any adjustments. It is possible to record them, though only one of those described below will be relatively intact after recording on a typical VHS VCR.

- Resolution wedge. Triangular wedges of black and white stripes aimed toward the center of the screen. This is the primary test pattern for eyeball evaluation of picture resolution. Look for where the individual vertical stripes of a vertical wedge merge into a gray mass and then locate the nearest calibration number, which usually gives the number of lines of horizontal resolution (sometimes divided by ten). This pattern is rarely found on prerecorded videocassettes, possibly because the measured results would be so bad (about 200 lines for standard VHS versus 330 lines for broadcast TV and more for laserdisc).

- Circle. Resolution wedges are usually part of a composite test pattern that includes one large circle in the center of the screen and four smaller circles at the corners. In this test pattern, anything that looks like a circle should actually be a circle. The circles should look neither squeezed from the sides nor squashed from the top and bottom. If the overall picture size is perfectly adjusted, the largest central circle should just meet the top and bottom edges of the screen. The roundness of the circles in this test pattern will survive recording on a VCR of almost any quality.

- Multiburst. This pattern looks like half a dozen vertical columns of black and white stripes that start wide on the left side and decrease in size to the right. They can be used to gauge resolution, but only roughly without the aid of test instruments. —D.R.
Large-screen viewing, whether on a standard NTSC set or a widescreen monitor with a 16:9 aspect ratio, introduces its own set of problems. For example, rear-projection sets all have specially constructed screens designed to throw as much light as possible directly forward. So the first thing to look for, especially if you expect ever to have more than one person watch your projection set at a time, is how the picture brightness falls off as you move to the sides of the viewing area. Note not only the overall decrease in brightness, but whether some portions of the screen grow dark faster than others.

Even from straight on, most projection sets also exhibit a fall off of picture brightness toward the corners. You should try to steer clear of sets that display more of this effect, even if it means choosing one with somewhat lower overall brightness. You can compensate for the latter by darkening your viewing room, but there's nothing you can do about the "vignetting." Darkening the room will also make the picture look better for several other reasons, and it is good practice for all video viewing, projection or not. You'll never see a brightly lit TV control room.

Digital picture processing is making its way into large-screen direct-view and projection sets, even if only in the guise of picture-in-picture (PIP) and freeze-frame features. Such digital manipulation is the bread and butter of widescreen and IDTV (improved-definition TV) sets and the absolute core of the upcoming broadcast HDTV (high-definition TV) system. Digitally processed video can vary considerably in quality, depending on the techniques and circuitry used, and it is not uncommon to see artifacts of the processing in current products that use it. It's therefore a good idea to be familiar with the most obvious side effects.

- Large, slowly varying areas of color can sometimes develop a contour-map effect when there are not enough digitization steps to encode a smoothy varying video signal. What was once a large expanse of color gets replaced by several smaller expanses of color with distinct borders between them.
- Inadequate motion processing can cause, on the one hand, blurring and smearing of fast-moving objects, and, on the other, a jumpy effect with very slowly moving objects.
- Improper, but possibly deliberate, stretching of the original picture to conform it to the proportions of a 16:9 screen can make it seem like the whole world has gotten squashed, or that the gravity control has suddenly been turned up.

While you may not be able to use these tidbits for a couple of years, you are now the first on your block to know some selection criteria for an HDTV set. —D.R.
A LASERDISC STARTER SET

If you have or are putting together a home theater system, it's not hard to come up with reasons to include a laserdisc player. Top on the list certainly would be the outstanding picture and sound available from laserdisc—often better than broadcast (especially in audio quality) and far superior to VHS. Many laserdisc releases are widescreen, or "letterbox," versions, to preserve the original framing and composition of modern widescreen films. (When broadcast or transferred to videocassette, widescreen movies are almost invariably cropped to fit the narrow confines of the television screen.) Some discs include interesting supplementary materials, and occasionally the movie itself is a special version re-edited by the director specifically for laserdisc to include scenes omitted from the theatrical release. And since all current laserdisc players also play CD's, you won't need a separate unit for that purpose. If you were going to buy a new CD player anyway, you can get the video capability as well without spending a great deal more money.

Let's assume that you've taken the plunge and are ready to start your own laserdisc library. Laserdiscs are readily available over the counter in big cities (sometimes for rental as well as sale) and from many reputable mail-order firms. There are now so many good discs, however, that you might at first find yourself a little perplexed about where to begin.

With that in mind, I've put together a list of ten discs that I think would make a great "starter set." There's nothing sacred about this list—I've even provided an alternative one on page 73, and it would not be hard to come up with others equally compelling. The tough part really was keeping the list down to just ten titles. The ones that made the cut are discs I consider to have exceptional video resolution and balance, excellent sound, and programming that will remain interesting on subsequent viewing. These are all discs that well exemplify "the laser experience." If somebody put one of them on after dinner, I'd make no excuse to leave, for they can be enjoyed over and over. So even though a few of the discs I've chosen represent hefty initial investments, all of them represent good value for the dollar in the long run.

BY RAD BENNETT
**LASERDISC STARTER SET**

**THE ADYSS: SPECIAL EDITION (1993)**
Color; three discs, six sides (Nos. 1, 2, 3, and 5 CLV, Nos. 4 and 6 CAV); digital stereo, surround; chapter stops; extensive supplements, including the documentary Under Pressure: The Making of The Abyss. 171 minutes (feature). Rated PG-13. FOX VIDEO 1988-80 $99.95.

The first release in the THX laserdisc program and possibly the best disc set in the entire catalog. For starters, director James Cameron completely re-edited his movie, turning what had been a suspenseful but confusing effort into a masterpiece. Then, in addition to the expected letterbox version, he supervised a "pan-and-scan" transfer, which is the one I'm recommending. The video image is astonishing in its immediacy and intimacy. Even more noticeable is the sound, without a doubt the best movie sound on laser and the best use of surround in the catalog. The audio mix is incredibly complicated, subtle, and effective: You feel transported into the various underwater locales. The letterbox edition is also excellent, but, as Cameron points out in an essay included with this boxed set, his pan-and-scan full-frame version is better for entertainment.

**THE ADVENTURES OF BARON MUNCHAUSEN (1989)**
Color; three discs, six sides (CAV); digital stereo, surround; chapter stops; letterbox (1.65:1 aspect ratio); extensive supplements. 126 minutes (feature). Rated PG. CRITERION 144 $124.95.

**BEAUTY AND THE BEAST (1991)**
Color; two discs, four sides (CAV); digital stereo, surround; chapter stops; supplemental promo and documentary; closed-captioned; letterbox (1.57:1 aspect ratio); extensive supplements. 84 minutes (feature), plus 26 minutes (supplement). Rated G. WALT DISNEY 1325 CS $49.95.

**JAWS (1975)**
Color; two discs, three sides (Nos. 1 and 2 CLV, No. 3 CAV); digital mono; chapter stops; closed-captioned; letterbox (2.35:1 aspect ratio). 120 minutes. Rated PG. MCA UNIVERSAL 41086 $39.95.

One of the great emotional-rollercoaster thrill films of all time, as Roy Scheider, Richard Dreyfuss, and Robert Shaw race to capture a great white shark that has been taking lunch breaks at Amity Island. The laser transfer is crisp and clean, with well-balanced color and excellent detail in spite of a fairly severe letterbox, necessary to preserve the film's theatrical aspect ratio. (Laser's resolution allows this—it would be unwatchable on videocassette.) Another laser feature is a bit of rethinking and editing by director Steven Spielberg, making this disc his latest, final version of his greatest action film.

**LAWRENCE OF ARABIA (1962)**
Color; two discs, four sides (CLV); digital stereo, surround; chapter stops; closed-captioned; letterbox (2.1:1 aspect ratio). 216 minutes. Not rated. COLUMBIA TRISTAR 79626 $49.95.

Every laserdisc collection should contain one of the big epics, and this is the very best. The movie is a justified legend, the reconstruction masterly, the transfer extraordinarily sharp. The sound is quite good, too—a very successful transfer from the original multichannel magnetic tracks of the 70mm release to the current Dolby Surround system. If you think surround sound is something new, take a listen to what was accomplished thirty-two years ago for this movie. The reconstructed print exists in several versions. Columbia Tristar's seems the best and is certainly one of the great bargains in the laserdisc catalog. One of the other editions has more supplementary material, but not enough to offset the cost savings this set offers.
THE LOST WORLD (1925)
B&W with color tints; one disc, two sides (No. 1 CLV, No. 2 CAV): newly composed stereo digital soundtrack; chapter stops; extensive supplements including original trailer, promotional film, excerpts from earlier Willis O'Brien films, and a large still-frame archive. Approximately 65 minutes (feature). Not rated. LUMIVISION LVD 9109 $49.95.

Think of it as an ancestor of Jurassic Park. One of the real bargains in the laserdisc catalog, this disc really gives you a chance to play with your player’s special features. Two different versions of the soundtrack are provided, and the trailers and shorts are immense fun. But where laser really comes into play is during the still-frames. Much of this classic movie has been lost forever, but photos survive for the missing parts. On laser, it is possible to watch the movie through once, then skip to the archive while the motion-picture sections are fresh in your mind and step through the stills of the missing sections. The movie itself, merged with the newly composed score, doesn’t seem dated at all. It’s an amazing achievement.

SULLIVAN’S TRAVELS (1941)
B&W; one disc, two sides (CLV); analog mono; chapter stops; theatrical trailer; 91 minutes. Not rated. MCA UNIVERSAL 40551 $34.95.

Black and white on laserdisc? You betcha. A really good B&W movie can be very sharp, and a good laser transfer puts back the thrill that is robbed from these films when they are presented in scratchy, damaged, low-contrast prints interrupted by commercials every 10 minutes. It’s like stripping the paint off a mundane work of art and finding an original Rembrandt. And almost no film is more worthy of this “laser rediscovery experience” than Preston Sturges’s hilarious, poignant look at the unfortunate of America through the eyes of a well-meaning filmmaker who wants to correct situations he doesn’t yet understand. Universal’s laserdisc release, crisp and clean, has great contrast and good sound for the era. All that and Veronica Lake, too.

Puccini: Tosca (1992)
Catherine Malitano, Placido Domingo, Ruggero Raimondi; RA1 Chorus and Orchestra, Zubin Mehta conducting. Color; one disc, two sides (CLV); digital stereo; chapter stops; subtitled. 115 minutes. TELDEC 4509-90212-6 $44.95.

The film versions of operas and ballets on laserdisc offer better camera work and more variety in sets than recordings of the stage versions—in short, all the benefits of a movie—but have always presented one big drawback: lip-synching of the soundtrack. Even when the same performers are used, you can almost always tell that they aren’t singing at the same time they’re acting. The acoustics of the audio tracks are also likely to be at odds with the visuals on the screen. For this Tosca, however, the engineers found a way to plant tiny microphones in the performers’ hair and set up audio and video links from the filming sites to a recording studio. That enabled them to have the singers actually singing and acting at the real locations. Puccini specified while the chorus and orchestra performed in a studio blocks away. The result is opera/drama on a level not previously experienced. The dynamic cast proves worthy, and the video transfer, except for some difficulty with the orange/red hues in Act II, is state-of-the-art. The “sets” are opulent, the costumes luxurious. A sizzling performance for all time. Bravo!

ALTERNATE TAKES
In case you get through the first ten discs in a hurry or can’t find some of them (or don’t want some of them), I rank the following right behind those in my main list:

CASABLANCA, CLV edition. CRITERION 125 $124.95.


GONE WITH THE WIND; 50TH ANNIVERSARY EDITION. CLV. MGM/UA ML101678 $49.95.


PATTON. Letterbox edition. FOX VIDEO 1005-85 $69.95.

PEYTON PLACE. Letterbox edition. FOX VIDEO 1855-85 $69.95.

THE QUIET MAN: 40TH ANNIVERSARY EDITION. REPUBLIC LV23361 $59.95.


20,000 LEAGUES UNDER THE SEA (1954)
Color; two discs, four sides (Nos. 1, 2, and 4 CLV, No. 3 CAV); digital stereo; surround; chapter stops; extensive supplements; closed-captioned; letterbox (2.35:1 aspect ratio). 127 minutes (feature). Rated G. WALT DISNEY 1587 CS $59.95.

Jules Verne’s classic adventure, offered especially for laserdisc fans in Disney’s Exclusive Archive Collection. Presented in its original theatrical aspect ratio, the picture is admirably crisp and exceptionally clean, with gorgeous color. The original multichannel magnetic soundtracks have been most successfully remixed to Dolby Surround. The sound effects bring the battle with the giant squid right into the room! There’s a wealth of extra material, live action and still-frame, including some animated sequences deleted from the final film. A whale of a tale!

THE WIZARD OF OZ (1939):
50TH ANNIVERSARY EDITION
Sepia and color; one disc, two sides (CLV); digital mono; chapter stops; closed-captioned; supplements. 101 minutes (feature), plus 18 minutes (supplements). MGM/UA 101565 $34.95.

The yellow brick road has never been as colorful on video as it is in this carefully prepared anniversary edition of a family classic that seems destined to live forever. The opening is sepia and white, as in the original film, and once Dorothy leaves Kansas and opens that door to Oz the color is eye-popping. Several deleted numbers, a theatrical-reissue trailer, and scenes from the 1939 Academy Awards are icing on a colorful cake. There have been other disc releases of this film, including MGM/UA’s recent CAV “Ultimate Oz” THX edition, but this one seems to constitute the greatest value for the dollar.

Rad Bennett is editor and publisher of The Laser Disc Gazette, a review newsletter for laserdiscs and CDs.
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SHOWSTOPPERS

Okay, at $30,000 Snell's THX-approved Music and Cinema Reference system is certainly not cheap—but it is state-of-the-art. It includes two 5-foot-tall Reference Towers with nine-driver arrays, the 23-inch-wide Reference 2800 LCR center-channel speaker, two 7-foot-tall SUR 2800 dipolar surround speakers, and a pair of 45-inch-tall SJB 1800 subwoofers, each of which uses a custom-designed 18-inch driver to achieve earth-shaking response down to 17 Hz. All cabinetry is wood veneer.

Pioneer's PD-F100 100-disc CD changer ($715) is the least expensive jumbo changer you can buy. Its four-drawer front-loading design is extremely practical, and it's not a space hog (dimensions are 16 1/2 x 7 x 13 1/2 inches). Each drawer holds up to twenty-five CD's, and discs can be grouped into three categories, such as jazz, classical, and rock.

A milestone in power-amplifier technology, Carver's Lightstar Reference amplifier ($3,800) is designed to eliminate the problems associated with driving reactive speaker loads. Instead of fighting the electrical peculiarities presented by speakers, it recycles reactive energy to keep its output strong and clean. Rated to deliver 300 watts per channel into 8 ohms, it will be available in May.
Looking more like an intergalactic blender than a car subwoofer, Phoenix Gold's MDU 10 Cyclone ($750) seeks to overcome the performance limitations of conventional cone subwoofers by using a DC motor and a "rotary radiator" to move air. Due to hit stores in June, the Cyclone is rated to play down to 20 Hz and to handle 600 watts of continuous power.

Arguably the most technically advanced autosound system on the planet, Pioneer's Optical Digital Reference system ($2,400 and up) offers a choice of fifteen components, including a pair of integrated amplifiers featuring fiber-optic inputs and a DSP section that performs parametric EQ, crossover, and time-alignment functions. The system can be controlled by an in-dash CD or cassette controller/tuner (CD version shown with supplied remote control).

Promising 150 channels with excellent sound and picture quality, the nation's first digital direct-broadcast satellite system should be operational in some parts of the country in a few weeks. To tune in, you'll need RCA's DSS package ($699)—an 18-inch satellite dish, a decoder/receiver, and a universal remote control. Users can sign up for programming packages from Direct TV and USSB.

In order to reproduce the bass that sometimes shows up in the surround channel of movie soundtracks—something many surround speakers are designed not to do—Energy's RVSS speaker ($550 a pair) functions as a dipole radiator only above 500 Hz. Below that point, its front and back drivers operate in phase to preserve bass output. The 10-inch-tall speaker is finished in black ash.

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SHOWSTOPPERS

Proceed's elegant PAV preamplifier ($4,195) features a refreshingly intuitive control panel. THX-enhanced Dolby Pro Logic processing, a Stereo Surround mode for music, six audio and four A/V inputs, a learning remote control, and three outputs, one of which can feed a secondary zone.

Perhaps the ultimate embodiment of the MiniDisc format's portability, Sony's MDX-490 car MD changer ($1,300) is a standard-size in-dash component that accepts a four-disc cartridge. The loading slot is cleverly concealed behind the detachable faceplate. Features include an easy-to-read twelve-character display of disc and song titles, a hideaway AM/FM tuner (not shown), and a joystick-like remote control.

Aside from being fairly compact and lightweight (32 pounds), Sharp's fourth-generation XV-S80U LCD video projector ($11,500) reaches new heights in LCD picture quality. Designed to be placed on a table or mounted on the ceiling, it can deliver 560 lines of horizontal resolution, has a built-in line doubler and speaker (for portable use), and is able to project images measuring from 25 to 200 inches diagonally. A wireless remote is included.

Audio Alchemy's DAC-in-the-Box ($200) is an inexpensive outboard digital-to-analog converter featuring 18-bit resolution and 95 dB of dynamic range. It can replace the D/A circuits of any CD player, laserdisc player, or other digital source component that has a digital output.
The magazine that knocks you on your ear

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Together Again—For The First Time
Mel Torme and Buddy Rich

Todd Rundgren
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Bonnie Raitt: Digging Up the Truth

Anybody expecting a reprise of “Nick of Time” or “Luck of the Draw” from Bonnie Raitt will be surprised by “Longing in Their Hearts,” which finds her in an overall more reflective mood. The new album’s opener, Tom Snow and Jimmy Scott’s “Love Sneakin’ Up on You,” works the snaky R&B groove that Raitt has mined so successfully her entire career, and so does her own “Feeling of Falling,” which mixes a scene of sex on the hood of a car with the more serious subject of substance abuse. But most of the record addresses romantic and psychological yearning in carefully crafted ballads set to the tempo of tears.

From Richard Thompson’s sad, gorgeous “Dimming of the Day” to her own “Circle Dance,” which seems at once a bittersweet love song to her father and a one-sided analysis of an often rocky romantic relationship, Raitt aims at uncovering long-buried emotional truths here. This album may be closer to the bone than her last two, then, and it is largely more interesting lyrically than musically despite producer Don Was’s frequent use of such ear-catching instruments as mutant oud and Celtic bass drum, and despite guest appearances by Levon Helm, David Crosby, Richard Thompson, Benmont Tench, and harmonica legend Charlie Musselwhite.

In most of the songs, Raitt seems less pop star than spiritual searcher. In that context, her burning slide guitar functions as more than exquisite instrumental texture—it’s practically a metaphor for the sound of a heart cracking open, possibly beyond repair. “Longing in Their Hearts” may not pack the big pop mega-hits of “Nick of Time” and “Luck of the Draw,” but it sounds as if Raitt’s punching a more important clock these days.

Alanna Nash

Frederic Chiu’s Refreshing Mendelssohn

Some new recordings are especially welcome for getting us interested in music we hadn’t known well (or at all), and some for reviving our interest in works we have perhaps known all too well. Frederic Chiu does a bit of both on his enticing new Harmonia Mundi CD of Mendelssohn’s piano works, making the strongest of cases for the three seldom-heard sonatas and a remarkably refreshing one for the familiar Rondo Capriccioso in E Major.

All of these are early works, even though the Second and Third Sonatas are labeled Opp. 105 and 106. Mendelssohn composed the Third Sonata, actually the latest of the four pieces here, at the age of eighteen, by which time he already had the masterly String Octet and the Midsummer Night’s Dream overture behind him. He did not himself assign Op. 106 to his Third Sonata—the same number Beethoven gave his so-called “Hammerklavier” Sonata—but he did write the work in the same key (B-flat Major) and opened it with a clear enough reference.
to the famous opening of the Beethoven work. Whether a conscious memorial gesture or not (it was composed in the year of Beethoven’s death), it also contains some less obvious echoes of other Beethoven works. There are similar citations and echoes in the Sonata in E Major, Op. 6, composed the previous year. The Sonata in G Minor, Op. 105, the work of a brilliant twelve-year-old, lacks references to Beethoven but is quite at home with the later pieces on this disc.

Mendelssohn's biographer Philip Radcliffe felt that the Rondo Capriccioso, composed in 1824 at the age of fifteen, was his “most individual work” up to that time. It has been, along with some of the Songs Without Words, among the most favored of his solo pieces—and no wonder, for it has that deliciously “elfin” quality that was to inform so many of the greatest works of his maturity.

I cannot imagine more effective advocacy for any of these works. Chiu makes his enthusiasm for them clear in his notes for the CD, and it is brilliantly evident in his absolutely wonderful playing, which, like the music itself, is instinctively elegant, charged with exhilarating vitality and at the same time unfailingly tasteful. This is the way to play this music, and the warm-textured realism achieved by the engineering team is surely the way to record a piano.

Richard Freed

MENDELSSOHN:
Piano Sonatas Nos. 1-3; Rondo Capriccioso
Frederic Chiu
HARMONIA MUNDI 907117 (67 min)

Redd Kross: Air Guitar Music That’s Not for Airheads

Remember the early Seventies? When the New York Dolls, Sparks, Mott the Hoople, and a few others proved that rock-with-brains and entertainment weren’t mutually exclusive concepts? Well, here in the Nineties Redd Kross is the standard-bearer for that heady (if lately unfashionable) buzz. Led by Pat and Jeffrey McDonald (brothers who have been recording under various guises since 1980 and are still only in their mid-twenties), Redd Kross is bratty Beatles, Led Zeppelin with a marshmallow-creme center, a group of power-poppers with a metal plate in their heads. Their new album “Phaseshifter,” is pure ambrosia—the guitars crunch, the tunes kick, and you find yourself wanting to hum and mosh at the same time.

Guitarist Jeffrey McDonald uncannily evokes early John Lennon when he opens his mouth to sing, especially on the exhilarating Lady in the Front Row, a raver about a starstruck fan that wouldn’t have been out of place on “Beatles ’65.” And “Phaseshifter” is composed of many such moments: Dumb Angel, a steady-rolling tune that hops along to a Zombies-style electric piano; Huge Wonder, with its superb musique-concrete intro and simmering riffs; Visionary, a power-tooled slab of neo-psychedelia that could have come from a late-Sixties biker-flick soundtrack.

These guys have learned their lessons well and applied them with the kind of wit and diligence that puts most of their contemporaries to shame. Above all, they’re aware of the rock continuum and their place in it. Maybe they’re just too clever for the charts in the Beavis and Butt-Head era, but in my opinion “Phaseshifter” is the smartest blast of affectionately derivative pop whimsicality since XTC masqueraded as the Dukes of Stratosphear. And it rocks like crazy.

Parke Puterbaugh

REDD KROSS
Phaseshifter
Jimmy's Fantasy; Lady in the Front Row; Monolith; Crazy World; Dumb Angel; Huge Wonder; Visionary; Pay for Love; Lady Evans; Only a Girl; Saragon; After School Special
THIS WAY UP/MERCURY
314 518 167 (44 min)
A Classic Mahler Fifth

Overall, the most satisfying performance of the Mahler Fifth Symphony yet to come my way is Claudio Abbado’s new one with the Berlin Philharmonic. He does a near-miraculous job of integrating every aspect of this huge work: the dramatic, the lyrical, the coloristic, and, above all, the polyphonic that dominates the complex outer movements.

The opening trumpet summons us to the funeral march in awesomely imperious fashion, and thereby sets the tone for all that follows. The drama in the music is given the fullest possible expression short of a lapse into hysteria. Abbado’s command of internal detail is breathtaking, yet details are not allowed to obscure the musical texture as a whole. His approach is more Classical than Late-Romantic, yet it never seems excessively analytical.

Nowhere is Abbado’s conception of the work more apparent than in his handling of the famous adagietto, the next to last movement. In recent years its basic tempo has been a subject for controversy, with Bruno Walter’s recordings at the fast end of the spectrum, Leonard Bernstein’s at the slow end. Abbado takes a middle course, and it works beautifully, especially given the warmth of the Berlin Philharmonic strings. I’ve never heard the opening bars emerge so imperceptibly from the very brief pause following the fantastical and kaleidoscopically varied 17-minute scherzo that is the symphony’s centerpiece.

As live recordings go, this one stands up to the competition in fine style and certainly conveys the excitement of the occasion. While I am less than partial to the inclusion of applause in such recordings, I was carried along with the Berlin audience after the heady exhilaration of the symphony’s final pages. Indeed, I am still applauding.

David Hall
Singer-songwriter Pat Alger is best known for writing a passel of hits for Garth Brooks, Kathy Mattea, and Trisha Yearwood, all of whom join him for background harmonies on "Seeds," his second solo album of the Nineties. As he reprises several of the songs others made famous, Alger bears more stylistic comparisons to the low-key Don Williams, for whom he's also written, than to bombastic Brooks, framing his songs in mostly acoustic, coffeehouse arrangements with little razzle-dazzle in either the backing instruments or voices. Much of Alger's work features a soft-sell spiritual context, posing questions about why we're here and offering philosophical advice on how to better navigate life's storms. At the least, the more familiar material demonstrates how a songwriter pounces cat-like, feints, and dodges, extensibility as he seizes himself into trances. Two songs on this debut EP are originals (Mojo Pin and Eternal Life), and two are covers, including a 10-minute take-off on Van Morrison's The Way Young Lovers Do. Buckley demonstrates considerable conviction and bristling originality in this captivatingly raw live set. A full-length album is forthcoming. Stay tuned. P.P.

Jeff Buckley
Live at Sin-e
COLUMBIA 77296 (27 min)
Performance: Astounding
Recording: Good

Here's a prime example of someone who's singing solely because the spirit moves him. This is not the kind of music that makes bank accounts fatter; it's an artistry that's indulged (occasionally) by record companies and devoured by a faithful few who have fallen under its spell. So it was with the late Tim Buckley, so it will be with Jeff Buckley (his son). Jeff's main instrument is his voice, which swoops, soars, pounces cat-like, feints, and dodges, extending syllables into a wordless wilderness of pure expression. He seems a little earthier than his father, with a touch more blues to complement his extemporaneous jazz-folk wanderings. Imagine a cross between dad and Robert Plant—it's not as improbable as it sounds. Buckley accompanies himself on minimalist electric guitar, punctuating his soliloquies with jagged chords and finny rhythms as he seizes himself into trances. Two songs on this debut EP are originals (Mojo Pin and Eternal Life), and two are covers, including a 10-minute take-off on Van Morrison's The Way Young Lovers Do. Buckley demonstrates considerable conviction and bristling originality in this captivatingly raw live set. A full-length album is forthcoming. Stay tuned. P.P.

Shawn Camp
SEEDS
REPRISE 45450 (33 min)
Performance: Hit bound
Recording: Very good

Newcomer Shawn Camp doesn't have the requisite country music name—"Shawn" doesn't exactly sound down-home, and "Camp" raises folky expectations—but reports of the death of analog vinyl continue to be greatly exaggerated. Case in point: the just-released old-fashioned vinyl 45 "Tommy in Seven Minutes." Talk about truth in advertising—here twelve underground New York City bands reduce Pete Townsend's ubiquitous rock opera to its breathless essentials (sorry, no Pinball Wizard), and a more glorious racket we've rarely heard. Pick hits: Iron Prostate's pummeling of I'm Free, the Lunachicks' rewrite of Acid Queen as Kraft Macaroni & Cheese Queen. hilarious and brilliant. [S4 postpaid, from Vital Music Records, P.O. Box 20247, New York, NY 10028-0052.] S.S.

Tommy in 7 Minutes!

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Crowded House
Together Alone
CAPITOL 27048 (52 min)
Performance: Strong
Recording: Superb

In the beginning, Crowded House seemed a light, melodic group of Aussie pop-pranksters who'd descended on Los Angeles to have a little fun. That perception earned them a following with their first album (and the hit Don't Dream It's Over), but they've since proven considerably more serious-minded, with each successive album plumbing the darker side of romance and things that go bump in the night. In the world of singer, guitarist, and chief song-
writer Neil Finn, love is an existential wilderness whose daunting vastness con-

jures astronomical metaphors in songs like "Distant Sun, Private Universe," and "Nails in My Feet," with the line, "I look into space / There is no connection / A million points of light and a conversation I can't face."

But strange and wonderful things can still happen in this imperfect world, and "Nails in My Feet" moves from wariness to surrender to rhapsody as the singer opens the doors of his heart to another.

Musically, the album is wonderfully rich and full, incorporating a troupe of log drummers, a Moanu choir, and a brass band into the lush, bracing popscape. For the sheer exhilaration of hearing a well-crafted tune, it's hard to beat "Pineapple Head," with its gorgeous, clarion twelve-string hook; "Kare Kare," a beguilingly mystical song with Byrds-like harmonies; and "Walking On the Spot," whose sweetly haunting melancholy recalls R.M.'s "Automatic for the People." "There's a case to be made for genesis based on the overall excellence and similarity between this latest Crowded House disc and "Before & After," the rec-

cent album by Tim Finn (Neil's brother). Both albums are, to my thinking, well-nigh indispensable.

LEMONHEADS

Come On Feel the Lemonheads
ATLANTIC 82537 (54 min)
Performance: Pop with feeling
Recording: Appropriately low-fi

Evan Dando, guitarist, singer, and song-

writer for Boston's Lemonheads, under-

stands the basic premise of power-pop: the way it combines the dynamics of rock with pop's melodic and often playful transmu-

tation of feelings into music. It's an unbe-

atable combination when it works, and in the hands of Dando and the Lemonheads, it works superbly.

Dando tips his hat about what makes it all tick in "Dawn Can't Decide," an off-the-cuff set of lyrics about a none-too-special day-in-the-life: "Feels good to be Jesse on the train today / cause D minor is a D minor damping and you strike the right chord in me." If you have to ask, "huh?" you're missing the point. It's all about feeling—pure, unretoched, and cast into music with a casual alchemy. Dando's guitar playing—filled with pretty chords and folksy strumming—and conversational voice evoke a winsome Eighties Brit acts like early Aztec Camera and Haircut One Hundred, and late-Sixties obscurity Orpheus.

"Come On Feel the Lemonheads" dwells in the realm of feeling. There's "The Great Big No (rejection), Into Your Arms (escape from loneliness), Style (rage and inner con-

flict), Rest Assured (desire), Favorite T (post-breakup melancholy), and the crown jewel in this collection, It's About Time. The words are scrawled but the feelings are palpable, radiant, and don't really demand elaboration. As modern society gets progressively more disconnected from itself, such rare gems of introspection deserve to be treasured all the more. P.P.

WILLIE NELSON

Moonlight Becomes You
JUSTICE 1601 (47 min)
Performance: Stardust memories
Recording: Okay

"J ust like Stardust ... Moonlight Becomes You," the press release reads, praying hard that buyers will remember their affection for the 1977 album of Tin Pan Alley favorites that sold four million copies, introduced Willie Nelson to a pop audience, and showed the country-music fans they liked some of those old love songs after all. But instead of "Son of Stardust," this is more like "Nephew ...."

"Moonlight Becomes You" is an obvi-

ously low-budget collection of standards (Sentimental Journey, You Always Hurt the One You Love) and more contemporary songs (You Just Can't Play a Sad Song on a Banjo) that do their best to please, but end up being less grabby than "Stardust." The album is a mammoth change from Nelson's last record, the stunning "Across the Borderline," with a return to a stripped-down rhythm section (lead and rhythm guitars, bass, drums, fiddle, and piano) and Texas-accented arrangements featuring guitarist Freddy Powers and fiddler Johnny Gimble. That said, it's also most enjoyable. Nelson sounding so laid back he might have recorded the whole thing prostrate on a mattress. If "Borderline" was gritty modern realism, "Moonlight" is hearts and flowers and nostalgia. After all these years, it seems Nelson is still a complete romantic. Of course, he'd have to be, considering the way these songs work out; nearly every

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love affair alluded to on the album ends in failure. Apparently moonlight doesn’t just become her—it also continues to raise hope in the heart of country’s staunchest renegade.

MARK O’CONNOR

Heroes
WARNER BROS. 45257 (66 min)
Performance: Smorgasbord
Recording: Very good

Mark O’Connor, Nashville’s session fiddler extraordinaire, has expanded into solo records the past few years, with notable results. This new album, a collection of genre-crossing, improvisational violin duets with his childhood heroes Charlie Daniels, Pinchas Zukerman, Vassar Clements, and Jean-Luc Ponty, is largely a delight. O’Connor, a wonderfully versatile musician, knows how to play in each of his idols’ styles and still retain his own voice—no small accomplishment. As for the program, standouts include the twin-fiddle jazz-rock fusion of New Country, with Jean-Luc Ponty, the Texas swing standard Fiddlin’ Around, with Johnny Gimble, a goosebumpy-good House of the Rising Sun, with Vassar Clements, and an almost classical rendition of PBS’s Civil War an-

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MARK O’CONNOR: Fiddling around

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RANCH ROMANCE
Flip City
SUGAR HILL 3813 (48 min)
Performance: Art house chic
Recording: Good
Seattle-based Ranch Romance—four wild-and-crazy women and their earnest-minded straight man—plays an inventive twist of western-swing-mets-jazz that earns points for effort, if not always execution. With songwriter/guitarist/singer Jo Miller (“cowgirl diva” in the press release) holding the reins, the group excels at instrumental, structural, and style-switching surprises—langid accordion solos feeding into energetic bluegrass-fiddle romps—and at times off-kilter lyrical jaunts. Wheatfield Annie, for instance, which blends strains of jazz, rock, New Orleans, and Cajun music, sounds like a mini-biography of k.d. lang—Annie’s an outrageous eccentric who keeps her small town abuzz (“Get out of the wheatfield Annie / You been going against the grain”). And Yes, Yes, Yes delivers a caustically funny look at love and marriage. Some of this sounds like contrived zaniness, and some of it peters out musically. But there’s enough spice to Ranch Romance’s shtick that k.d. lang herself invited them to open for her on tour. “Flip City” will keep your head spinning and your toe tapping—on the ranch, in the trailer park, or in suburban condos coast-to-coast. A.N.

TONY RICE
Plays and Sings Bluegrass
ROUNDER 0253 (41 min)
Performance: Classic bluegrass
Recording: Good
Tony Rice has long been one of bluegrass music’s most influential pickers, his distinctive guitar runs, soulful flat-picking solos, and progressive chording techniques setting him apart from his early days with J. D. Crowe and the New South. This album, the first since 1977 to carry Rice’s name only, finds him recasting the bluegrass classics of the Fifties and Sixties to excellent effect—only Bob Dylan’s Girl from the North Country, with its souped-up tempo, suffers from a ‘grassy adaptation. Rice’s sidemen—his old friends Vassar Clements on fiddle and Jerry Douglas on dobro—are first-rate. But Rice, who delivers his less-than-commanding vocals with all the verve of a 100-watt light bulb, is also capable of a more emotionally moving album of contemporary material a la his 1984 release “Cold on the Shoulder.” Until he’s ready to plow that earth again, this is a fine way to get reacquainted with the music of Hylo Brown, Bill Monroe, Flatt and Scruggs, and the Country Gentlemen. No extra charge for the hot licks. A.N.

TEENAGE FANCLUB
Thirteen
DGC 24533 (70 min)
Performance: Too long
Recording: Good
“Thirteen” is a gilded lily of a record. The musical equivalent of a run-on sentence, it just goes on and on, a numbing movie-length CD that ought to have been edited down to LP size. Part of the problem with Teenage Fanclub is that they remain overly derivative—they’ve got Big Star written all over them (even the title of the disc is that of a Big Star song). But they haven’t yet learned how to say their piece with that band’s taut economy, and as musicians they’re still a little wet behind the ears. Of course, great musicianship has never guaranteed good music, but Teenage Fanclub has yet to devise an approach that is so totally theirs that the question of how well they play becomes moot.
At best, the album is a pleasant distraction, its even surface broken by the occasional standout track: the George-Harrison

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CIRCLE NO. 40 ON READER SERVICE CARD
Teenage Fanclub: wet behind the ears?

Ba-Da-Boom, Ba-Da-Bing!!

At last! Although Bing Crosby ranks with Sinatra and Presley among the most influential American male pop singers of the past century, he’s not been well represented on CD—until now. MCA’s four-disc “Bing Crosby: His Legendary Years 1931-1957” collects 101 tracks that provide a fascinating history of mainstream American pop music from the Thirties to the mid Fifties. Of course, extensive as it is, this handsomely-boxed set includes only a fraction of the Crosby recordings in the vaults, but it’s an extremely well-chosen set—duets with Connee Boswell, Judy Garland, Louis Armstrong—and it offers essentially the crème de la crème. Will Friedwald’s perceptively analytical and ungushy notes are supplemented by a first-rate discography. Let’s hope MCA matches this with a Volume Two—and maybe even Three and Four. R.H.

Collections

RIG ROCK TRUCKSTOP
DIESEL ONLY/FRUIT OF THE TUNE 999
(60 min)
Performance: For the hiccrap truckers
Recording: Good enough for jukeboxes
Fresh on the tire marks of last year’s “Rig Rock Jukebox,” this second collection of experimental country, country-rock, and country-blues-punk-jazz brings back many of the acts that made the first batch so irresistible, namely the World Famous Blue Jays, Angel Dean & the Zephyrs, Courtney & Western, and the Five Chinese Brothers. Most of these bands frequent New York clubs rather than Nashville or L.A. watering holes, so they have no Old Guard to please. No lyric or instrumental formula to follow, and no toes they can’t step on (witness Will Rigby’s hilarious Ricky Skaggs Tonight, in which he has his evil way with the holier-than-thou picker/singer to Jew’s Harp accompaniment).

Not everybody here is ready for prime time exposure—not even in the front cub of an eighteen-wheeler or in a roadside jukebox—but several of these acts could charm the Freehauf logo from its rearside home: Angel Dean is a truck-stop angel if there ever was one, the Wheelers & Dealers turn out tongue-in-cheek cheating’ songs to die for (Out of the Frying Pan [Into Desire]), and the World Famous Blue Jays amply prove why they deserve their name. If your taste in country runs along the lines of, “She smells as good as the inside of a new Corvette,” these twenty tracks should more than race your motor. A.N.

THE WORLD IS A WONDERFUL PLACE: THE SONGS OF RICHARD THOMPSON
GREEN LINNET 3086 (75 min)
Performance: Hearty
Recording: Good

Compilations by homage-minded singers performing the works of a singular cult artist are always risky ventures. The danger is that the cover performers will deliver a note-for-note rendition, which makes the listener wonder why they bothered.

The songs of Richard Thompson fare better than most in this circumstance, in part because the majority of artists involved—who hail from both Britain and America—largely avoid that pitfall. There’s some deadly dull stuff here, as the singers select from Thompson’s entire catalog, no matter how old. But there are also some highly spirited—and spiritual—performances, particularly Christine Collister’s version of How Will I Ever Be Simple Again, Ian Kearey and Ivor Cutler’s Wheely Down, Victoria Williams’s Reckless Kind, and Sally Barker’s I Misunderstood. Give Men and Vols credit for picking Love Is Bad for Business, which in this case of well-placed idolatry shouldn’t be. A.N.

JAZZ REVIEWS

KENNY BARRON
Other Places
VERVE 699 (67 min)
Performance: Robust
Recording: Very good

Pianist Kenny Barron’s approach to jazz is always a delight. There are no tinkles, no well-worn clusters—just straight-ahead jazz that swings with imagination. On his latest release, “Other Places,” Barron leads a formidable sextet that has saxophonist Ralph Moore and vibist Bobby Hutcherson in front, with bassist Rufus Reid and percussionist Victor Lewis and Mino Cinelu laying down the foundation. It’s a combination that works very well throughout. Highlights include a lovely, introspective duet with Hutcherson and a wonderful reading of I Should Care, for which Mr. Barron’s sole accompanist is bassist Reid. A terrific album. C.A.

RODNEY KENDRICK
The Secrets of Rodney Kendrick
VERVE 382 (60 min)
Performance: On target
Recording: Very good

The notes alone are worth the price of Rodney Kendrick’s debut album, but that’s because they were freshly translated English. Fortunately, the music is quite another matter. Kendrick’s early keyboard experience was mostly with pop groups, but four years spent studying with Barry Harris, a lot of gigging around in New York, and a stint with Abbey Lincoln clearly prepared him for the complexities of jazz. Here he leads a fine group of musicians through a program that is as varied in mood as it is in tempo. Trumpeters Roy Hargrove and Graham Haynes (drummer Roy’s son, who actually plays the cornet) are unpredictable sparks that light up more than one track. Kenny Garrett’s alto is slithery and articulate, and Houstoun Person’s tenor is particularly expressive on the ballads Shapoo and Down Here Below. Bassist Taurus Mateen is appropriately chameleonic in this diverse mix, and Kendrick gives a series of impressive performances. I don’t know what the cryptic title alludes to, but if Rodney Kendrick has secrets, one of them is obviously talent. C.A.
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ABBREY LINCOLN
When There Is Love
VERVE 96972 (64 min)
Performance: Exquisite
Recording: Very good

Having followed Abbey Lincoln’s career for about thirty-five years, I am delighted to see that she is finally getting the recognition that has always been due her. (I still think that her considerable acting talent is being neglected, but at least she’s recording again.) Her latest effort, following last year’s “Devil’s Got Your Tongue,” is a marvelously intimate collaboration with pianist Hank Jones, a delightful 64-minute set that is largely devoted to love songs. As Ms. Lincoln notes, the choice of material deliberately contrasts with some of her previous albums, which tended to reflect a somber outlook on life.

There are not many genuine jazz singers on the scene today, so, with screaming wannabes and listless imitators captivating an increasingly indifferent audience, Abbey Lincoln becomes even more valuable to the music. As for Hank Jones—well, they don’t come any better. This is a perfect match, and another triumph for an artist who deserves all her recent accolades. C.A.

STANLEY TURRENTINE
If I Could
MUSICMASTERS JAZZ 65103 (55 min)
Performance: Robust
Recording: Very good

Like so many vigorous tenors, Stanley Turrentine soaked his reeds in R&B before making the jazz scene. He played with Ray Charles and Earl Bostic in the early Fifties, entered the Sixties with Max Roach, and enjoyed considerable success during the decade as he teamed up with his wife, organist Shirley Scott. In recent years, Turrentine has continued to demonstrate his solid grasp of bop and his ability to lean in on the music. His new album, “If I Could,” clearly proves that he can do just about anything the occasion calls for. For openers, he hops merrily along with Hubert Laws, Ron Carter, Roland Hanna, and Grady Tate. Then Don Sebesky and a string section place him in a more romantic context, where he also thrives. Hard-core jazz people may still frown on strings, but Turrentine’s work on I Remember Bill, Maybe September, and the title tune cries out for a whole album with a string section. C.A.

QUICK FIXES

AUSTIN LOUNGE LIZARDS
Paint Me on Velvet
FLYING FISH 70618 (36 min)

Here’s a band that should appeal to the slightly wicked in us all, whether you appreciate bluegrass, country, swing, or re-worked versions of Purple People Eater. The Austin Lounge Lizards prove their tongues are just as quick and flickery as their namesakes’. Who could resist a comic take on Baby Jessica, twisting the night away at the bottom of the well in Midland, Texas? Or the right-on sentiments of anyone who secretly plots to Put the Oak Ridge Boys in the Slobber? A.N.

JIM CENTORINO
Ivory—A Tribute to the Endangered Species
WORLD DISC CDM 30 (53 min)
Composer/trumpeter/keyboardsit Jim Centorino mixes animal calls and other sounds of nature with his music to create a dozen impressionistic pictures of the environments of wolves, whales, waterfowl, and other endangered creatures. The dramatic title track and the beautiful Song of the Albatross raise this above the level of merely pleasant light classical or New Age music.

WILLIAM LIVINGSTONE
I Remember Bill, Maybe September
RHINO 71511 (57 min)

The testosterone-heavy voice of New England folkie Bill Morrissey is nothing short of compelling, even when his songs blander out. And the surprise of this latest album is that too many of the tunes do exactly that. The only songs here that stick are Birches, a deftly painted portrait of a still-hopeful wife and a dried-up husband, and the very funny Letter from Heaven, in which Abe Lincoln finally gets to see the end of the play and James Dean takes remedial driving lessons. A.N.

HARRY SHEARER
It Must Have Been Something I Said
RHINO 71217 (78 min)

Satirist Shearer (still perhaps best known for his role in This Is Spinal Tap) has been a Public Radio fixture since 1983, and this savagely funny album collects some of his most trenchant on-air bits. Instant classic: an interview with the only American transsexual held hostage during the Gulf War. S.S.

WEBB WILDER AND THE BEATNECKS
It Came From Nashville
WATERMELON 1018 (51 min)

Wilder’s brand of neo-country geek rock was ahead of its time when this 1985 album (here fleshed out with bonus tracks) was originally released, and in the age of Garth Brooks it still is. Pick hit: a great live cover of Steve Earle’s anti-handgun parable The Devil’s Right Hand. S.S.
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BACH: Partitas (BWV 825-830)
Christophe Rousset (harpsichord)
L'ÔISEAU-LYRE 440 217
(two CD's, 154 min)
Performance: Breaks the mold
Recording: Vivid

Strong musical personalities aren't usually attracted to the harpsichord, but Christophe Rousset plays the Bach partitas with the sort of individuality that changes the way people think about music. For instance, the harpsichord sound favored today is increasingly creamy and focused; Rousset's restored French Baroque instrument is less well-mannered, and the effect is as bracing as it is beautiful. He plays with even greater deliberation than Gustav Leonhardt, he lingers over harmonic resolutions, and, in general, he takes a highly flexible approach to tempos—quite a refreshing change from the sewing-machine rhythms still common among early-music specialists. The ornaments and other fine details of the music never seem graftcd on but emerge as integral parts of the whole.

Rousset makes some of the livelier movements dance, but that consideration seems clearly secondary to the expression of the moment. His playing has the sort of clarity and detail that Glenn Gould's had at his best, though without most of Gould's annoying idiosyncrasies. Unless you have ironclad ideas about how this music should go, don't miss this CD.

D.P.S.

BRITTEN: Sinfonia da Requiem; Four Sea Interludes and Passacaglia; The Young Person's Guide to the Orchestra
PURCELL (arr. Britten): Chacony
London Philharmonic, Slatkin
RCA VICTOR 61226 (68 min)
Performance: Mostly excellent
Recording: Resplendent

Leonard Slatkin comes through with a powerful account of the youthful and impassioned three-movement Sinfonia da Requiem that Britten dedicated to the memory of his parents. Many traits of the later Britten reveal themselves in it, but the work stands handsomely on its own as a musical achievement. Slatkin secures playing of surpassing brilliance (the "Dies Irae" middle movement) and warmth (the "Abendlieder" finale) from his London orchestra. The strings are richly l USCREATV in the beautifully realized Purcell Chacone, and The Young Person's Guide to the Orchestra—illustrative variations on a tune from Purcell's Abdelazar—is given one of the most brilliant and gorgeously recorded performances that I have heard. I particularly like the way Slatkin keeps the Purcell theme surging forward in the introduction rather than allowing it to bog down in pompousness.

My one reservation has to do with Slatkin's very deliberate reading of the first two of the Sea Interludes and of the Passacaglia from Peter Grimes. His approach works, however, in the "Moonlight" interlude, where the extended pauses add an extra degree of poignancy, and the "Storm" episode is interesting for the way he concentrates on opening up the musical texture, thus avoiding the clotted effect in the low end of the orchestral spectrum found in many other recordings. The slow tempo of the Passacaglia, though, deprives this remarkable music of some of its relentless savagery. Taken as a whole, however, this is a splendid CD.

D.H.

DOHNANYI: Serenade for String Trio
KODALY: Serenade for Two Violins and Viola
BARTOK: Sonata for Two Violins and Viola

For its debut on the Delos label, the Chamber Music Society of Lincoln Center has come up with a handsomely varied program featuring the between-the-wars "Big Three" of Hungarian music. Ernst von Dohnanyi (1877-1960) is the senior partner, and his C Major Serenade (1902) has for many years been a deservedly popular vehicle for string trio. With a touch of Brahms here and a tincture of Hungarian folk music there, its five movements feature unerringly effective writing for the three instruments, both solo and in combination.

The early output of Zoltan Kodaly (1882-1967) is highlighted by the lovely three-movement Serenade from 1919-1920, which instead of the standard violin, viola, and cello uses a pair of violins and a viola. There is no mistaking the Magyar content of the music, but what is most striking is the composer's masterly command of coloration, most notably in the violin-violin dialogue that dominates the central movement. The Dohnanyi serenade features violinist Joseph Silverstein, violinist Paul Neubauer, and cellist Gary Hoffman, and in the Kodaly violinist Ani Kavafian partners Silverstein and Neubauer is again the violinist. The performances are first-rate and beautifully recorded.

The real "meat" of the program is Bela Bartok's ingenious masterpiece from 1937, the Sonata for Two Violins and Percussion. Even today it makes challenging and exhilarating listening—tough-minded in the opening movement, uncannily atmospheric
The Cleveland Orchestra at 75

The Cleveland Orchestra, founded in 1918, turned seventy-five last year, and in celebration of that anniversary has brought out a set of ten compact discs containing performances conducted by all of its music directors, from the founding one, Nikolai Sokoloff, to today's Christoph von Dohnanyi. Of the twenty-five performances in the set, spanning the years 1928-1992, only five come from commercial recordings; all the others are from concerts the orchestra has given in Cleveland and on tour.

George Szell gets the lion's share of the set, four discs covering his entire twenty-four-year tenure (1946-1970). In addition to the expected Mozart, Schumann, Wagner, and Strauss, there are works by Ravel, Prokofiev, and Mahler as well as two Sibelius symphonies—the seldom heard No. 3, from early in Szell's first season, and No. 2, from his very last concert, given in Tokyo two months before his death.

Sokoloff, a fine conductor too little remembered now, presided over the first fifteen seasons, during which the orchestra began recording (for Brunswick) and built its own home, Severance Hall. His 1928 recording of Rachmaninoff's Second Symphony was the first made of the work. His famous successor Artur Rodzinski, whose ten years established the orchestra as a major national entity, is represented by his first recording for Columbia, Rimsky-Korsakov's Scheherazade from 1939, and his memorable 1941 account of Shostakovich's First Symphony. The late Erich Leinsdorf, only thirty-one when he succeeded Rodzinski, receives a lovely memorial in the form of his own suite of preludes and interludes from Debussy's Pelléas et Mélisande, introduced in his final season and a collector's item on LP for years.

Pierre Boulez served as musical advisor for the two seasons between Szell's death and the arrival of Lorin Maazel. His material here includes Prokofiev's Scythian Suite, works by Stravinsky and Messiaen, and his Columbia recording of Ravel's Daphnis and Chloe Suite No. 2. Maazel conducts Jacob Druckman's Windows, one of only two American works in the set, and is heard also in a slightly cut Tchaikovsky Manfred. Dohnanyi conducts the other American work, Carl Ruggles's Sun-treader, as well as Kurt Weill's Seven Deadly Sins (with Anja Silja), Mahler's Requiem (with Jose van Dam), a fragment of a symphony Schubert sketched in his last year, Beethoven's Grosse Fuge, and a knockout performance of Brahms's G Minor Piano Quartet in Schoenberg's orchestral setting.

However unattractive that may sound, the Seventh contains some of the more inviting music Henze has written and may be his greatest symphony yet. The second movement makes a particularly remarkable journey with its rarefied string effects, richly scored horn sextet in the middle, and many other lovely textures along the way. The final movement is downright sumptuous—the free use of dissonance suggests Henze may be picking up where Mahler's unfinished Tenth Symphony left off. The disc filler, the Barcarola, is more searching and discursive. Frankly, I don't get it. But it's so flamboyantly scored that I'll happily listen to it again and again until I do.

The Cleveland Orchestra's current music director, Christoph von Dohnanyi

T his is a very exciting and hip record. Graham Fitkin, a young (thirty-not-even-something) British composer, has his own quite engaging version of what used to be thought of as American minimalism: witty and easy on the outside, tough as steel underneath. It's all done with a catchy, insistent pop/jazz sound doled out in highly rhythmic blocks and layers. Fitkin is, among other things, a brilliant orchestrator—as is most obvious in the somewhat more traditional Cud (essentially a quirky big-band jazz piece) but also evident in the other, more original and personal pieces, restrained as they are in form and instrumentation. Other consistent features here are the quality of the playing—mostly by the ensambles for which the music was written—and of the recording. The level of excitement is remarkably sustained; the music jumps.

HENZE: Symphony No. 7; Barcarola per Grande Orchestra
City of Birmingham Symphony, Rattle
EMI 54762 (60 min)

Performance: Bone-rattling
Recording: Exciting

H ans Werner Henze has been through more stylistic changes than Madonna, but his musical language seems to be stabilizing into something that can be vaguely described as neo-Hindemith—full of motor rhythms and metallic, brass-dominated sonorities, and, particularly in the Seventh Symphony, using the tonality-based forms of the past without a tonality-based language. In fact, much of Henze's Seventh, which he admits was somewhat inspired by Beethoven's, seems like a Classical/Romantic symphony that's been put through a trash compactor and come out completely flattened. Much of it gives the impression of being harmonically static, the first movement sounding like the Die Walküre prelude with the contours smoothed out.

However unattractive that may sound, the Seventh contains some of the more inviting music Henze has written and may be his greatest symphony yet. The second movement makes a particularly remarkable journey with its rarefied string effects, richly scored horn sextet in the middle, and many other lovely textures along the way. The final movement is downright sumptuous—the free use of dissonance suggests Henze may be picking up where Mahler's unfinished Tenth Symphony left off. The disc filler, the Barcarola, is more searching and discursive. Frankly, I don't get it. But it's so flamboyantly scored that I'll happily listen to it again and again until I do.

MENDELSSOHN:
A Midsummer Night's Dream (excerpts): The First Walpurgis Night
Solostis; Chorus; Chamber Orchestra of Europe, Hamancourt
TELDEC 74882 (78 min)
Performance: Scintillating
Recording: First-rate

Not the least of the many virtues of this CD is the programming, which pairs two quite different treatments of fantastical subject matter. The usual recorded excerpts from the Midsummer Night's Dream music are the overture, scherzo, intermezzo, noc-

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CLASSICAL MUSIC

Arvo Pärt writes atmospheric works that conjure up images of medieval churches and devout pilgrims praying for the deliverance of their souls—even in the *Te Deum* and *Magnificat*, which usually elicit more joyful response from composers. Given ECM's church recording acoustic, this CD amounts to a highly reactionary musical statement, a severe and determined departure from the hectic, urban late twentieth century.

Consisting mainly of recently composed choral works, the program explores a narrow palette of austere harmonies, somber colors, and sparse, modal scales. Predictability sets in, and I began to wonder how much substance lies behind the atmospheric effects. Particularly in the Berlin Mass, Pärt's extremely generalized approach toward setting the texts is comparable to the medieval style—when music was considered only a vehicle for the words rather than the words being occasions for musical expression. All that is not to say this disc isn't enjoyable, only that its joys are rather limited. D.P.S.

ROSSINI: La Cenerentola
Baroli, Dara, Matteuzzi, Corbeli, others; Chorus and Orchestra of Teatro Comunale di Bologna, Chailly
LONDON 436 902 (two CD's, 148 min)

Performance: Ingratiating
Recording: Clear, bright

La Cenerentola (Cinderella) may lack the tight dramatic construction and the incisive three-dimensional characterizations of *The Barber of Seville*, Rossini's most celebrated comic opera, and yet I am immediately and inevitably enchanted by the music, which is full of melodic ingenuity, orchestral luminosity, and irresistible zest and good humor. This London recording offers those qualities in abundance.

The orchestra plays with spirit under Riccardo Chailly, and the cast is strong. Cecilia Bartoli's clear, limpid, easily produced, and finely focused voice meets every challenge of range and florid ornamentation that the title role presents. At the same time, she creates a believable character—warm, gracious, winning. William Matteuzzi's Ramiro is puzzling; at times melody smooth and with the effort of meeting the composer's demands for very long leaps to very high notes. On the other hand, the Dandini of Alessandro Corbeli is polished, fluid in the coloratura sections, and full of theatrical bounce. Don Magnifico is not an appealing character, but he has the three longest arias of the opera. Enzo Dara, however, makes him as attractive as possible and makes at least use of his gruff but flexible voice. The wispish sisters, Clorinda and Tisbe, are sung with verve by Fernanda Costa and...
Gloria Bandelli, respectively, and Michele Pertusi’s Alidoro is warm-voiced and compassionate. R.A.

R. STRAUSS: Violin Concerto; Oboe Concerto; Duett-Concertino for Clarinet and Bassoon
Belkin: Hunt; D. Ashkenazy; Walker; Berlin Radio Symphony. Ashkenazy
LONDON 436 415 (76 min)
Performance: Very good
Recording: Pleasantly roomy
Richard Strauss very early, Richard Strauss very late—the combination adds up to interesting and pleasing listening. The Violin Concerto, a product of the composer’s seventeenth year, doesn’t exhibit the full stylistic imprint of his maturity, but it is very effectively written on a surprisingly large scale. There are touches of Bruch in the opening movement and a dash of Mendelssohn in the central andante. Only in the mercurial finale do we get a hint of the creator of Don Juan. Curiously, Strauss provided no cadenzas, and violinist Boris Belkin doesn’t either. He does, however, deliver a ringingly brilliant account of the solo part. Vladimir Ashkenazy has his Berlin players well in hand, and the Jesus-Christus-Kirche provides a handsome acoustic surround.

With the 1945 Oboe Concerto, one of the prizes of the aging composer’s creative Indian summer, we are on more intimate ground. Oboist Gordon Hunt has a rather broadish tone for my taste, but the performance as a whole is very pleasant.

My favorite piece here is the Duett-Concertino, the composer’s last instrumental work, in which solo clarinet and bassoon are accompanied by string orchestra and harp. Along with lyrical nostalgia there is an ample touch of subtle humor, especially in the dialogue episodes of the opening movement. The performers, clarinetist Dimitri Ashkenazy and bassoonist Kim Hunt, give an excellent account of themselves and of the delectable music.

D.H.

STRAVINSKY: The Firebird; Fireworks; Four Etudes for Orchestra
Chicago Symphony. Boulez
DEUTSCHE GRAMMOPHON 437 850 (60 min)
Performance: Clarifying
Recording: Gorgeous
So many of Deutsche Grammophon’s recordings of Russian music in the last several years have been as valuable for Richard Taruskin’s authoritative annotation as for the performances themselves. For Pierre Boulez’s remake of the complete Firebird ballet, Taruskin is once again exceptionally thorough, clarifying or correcting various details in the work’s background. Clarification, of course, is what Boulez himself has always offered in abundance; if his Chicago Firebird is a tad less gutsy here and there than his earlier CBS/Sony recording with the New York Philharmonic, it is more telling in the poetic-evocative sections, and surely more appealing overall for the downright gorgeous sound, which sets off both the voluptuousness and the clarity of the performance to full advantage without compromising either of those qualities.

The brief Fireworks scherzo seems more like an X-ray here than a pyrotechnic display, but the Four Etudes for Orchestra—no mere makeweights—are absolute knockouts, individually and collectively. R.F.

VERDI: Falstaff
Soloists; Chorus; Berlin Philharmonic. Solti
LONDON 440 650 (two CD’s, 122 min)
Performance: Very good
Recording: Very good
With an outstanding 1963 Falstaff (also on London) ranking high among his many accomplishments, it is surprising that Georg Solti would tackle this opera again...
BEETHOVEN: Symphony No. 5; Egmont, Overture and Incidental Music
New York Philharmonic, Masur
TELDEC 77313 (75 min)
The first, third, and last movements of this performance of the Beethoven Fifth are sinewy and alive with all the requisite tension, and in the slow-movement variations Kurt Masur elicts unusually refined playing from the winds and a heartwarming glow from the strings. The overtone and vocal and instrumental numbers written for Goethe's Egmont, played beautifully by the orchestra and performed with drama and pathos by soprano Sylvia McNair and narrator Will Quadflieg, amount to a real bonus. Highly recommended.  D.H.

MOZART: Serenade in D Major ("Posthorn"); Divertimento in D Major; Two Marches
Berlin Philharmonic, Abbado
SONY 53277 (77 min)
Claudio Abbado's robust live performance of the so-called "Posthorn" Serenade, flanked by similarly spirited ones of the so-called "Posthorn" Serenade, flanked by similarly spirited ones of the so-called "Posthorn" Serenade, flanked by similarly spirited ones of the marches presumably intended to introduce and follow it, has vivacity and charm aplenty. The same large-scale approach suits the Divertimento, K. 251, a little less well, tending to override its essential chamber-music character, but the performance does sparkle, and it makes an already well-filled disc even more attractive.  R.F.

MARCUS KLINKO
French Harp Chamber Music
EMI 54884 (71 min)
Markus Klinko's highly ingratiating program includes Ravel's Introduction and Allegro and other works. Debussy's Dance Sacrée et Profane and Sonata for Flute, Viola, and Harp, and pieces by Satie, Ibert, and Fauré. He has a beautiful tone and a remarkable range of articulation, but the other players—colleagues from the Bastille Opera Orchestra in Paris—don't sound as if they've lived with the music terribly long.  D.P.S.
Classical Music

after thirty years. Does he succeed in topping his earlier effort? Well, yes and no.

In the earlier set, the conductor was not the best thing about the recording. Now, surrounded by his Salzburg Festival cast in a Berlin venue, he is. His pacing is vital but not excessively driven—the old Solti vehemence is gone. The overall approach is unmoderated by his Salzburg Festival cast in a

- RCA reading. In 1963 Solti was marginally
- mence is gone. The overall approach is un-
- rounded by his Salzburg Festival cast in a
- after thirty years. Does he succeed in top-
- ping his earlier effort? Well, yes and no.

Except for one instance of miscasting, the singers form an excellent ensemble. José van Dam may not possess the dark timbre and "fat" tone considered ideal for the old knight, but he savors Boito's text and pro-

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Collection

HOMAGE TO COUPERIN
Pavlina Dokovska (piano)
ARCADIA 2000 (69 min)
Performance: Knowing
Recording: Good

The idea of packaging Ravel's memorial gestures (more or less) the style of
Couperin, Le Tombeau de Couperin, with some of Couperin's own keyboard pieces
may not be quite without precedent, but it's
still an intriguing one, and the Bulgarian pi-

- Nancy (Elizabeth
- Norberg-Schulz) and Meg Page (Susan
- Graham) are good, and Luca Cannone offers
- a stylish Fenton when his slender tone is not
- swallowed up in the ensembles. The Bardol-
- pistola-Cajus trio excels in the
- comedic scenes.

- This is a live recording, but applause in-
- trudes only at the beginning and end. Digital
technology aside, I do not find the overall
sound superior to that of the earlier set. In
fact, a more forward placement of the voic-
- es would have been desirable. The perfor-
- mance, however, is a triumph for Solti—and
- for Van Dam as well.

G.J.

Vivaldi: Le Quattro Stagioni
Biondi; L'Europa Galante
OPUS III OPS 56-9120 (54 min)
Performance: Italian flair
Recording: Fresh bloom

Fabio Biondi, a violinist and the founder/leader of the ensemble L'Europa Ga-
lante, apparently wants to get as close as possible to Vivaldi's sound and spirit. It
is not just a question of period instruments but also of a certain flair. He reminds us
that Vivaldi was Italian—a priest perhaps, but also an opera man, a stylish figure in a
stylish age, and a composer whose music was in demand all over fashionable Europe.

The performances use an early manus-

- scription version of The Seasons once owned by a Roman cardinal and now in, of all
- places, Manchester, England. There are two add-ons, including the strange "Conch-
- Shell" Concerto (apparently intended to im-
- itate the sound of a horn made out of a sea-shell) and a concerto that was dedicated
to the Emperor Charles VI. The theatricality of the playing meshes perfectly with el-
- egant musicianship; intensity and good hu-
- mor support an unerring sense of style. The
effect is like a well-restored painting by

Caravaggio or Tiepolo; the freshness of the colors, the dramatic contrasts of the com-
position, the very Italian bravura, and the uni-
versality of the appeal suddenly leap out across the centuries.

E.S.

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30 Years Ago

In his editorial in the April 1964 issue, Furman Hebb alerted readers to a detachable paperbase 33 1/3-rpm record of Glenn Gould's "So You Want to Write a Fugue." This is not only the first time a music magazine has included a recording in its pages, Hebb noted, "but one of the few times any magazine has done so."

New products this month included the Hartley Concertmaster multiple-driver speaker system, with an 18-inch woofer for bass response down to 16 cps (Hz), and the H.H. Scott 370B stereo tuner with "magic-eye" tuning indicator ($159.95). In test reports, Julian Hirsch evaluated the Sony TC-500 portable four-track tape recorder ("It does as good a job as any recorder I have used") and the EMI 319 speaker, described as "basically a good reproducer."

Fighting words? A favorable December review of the Swingle Singers' "Bach's Greatest Hits" prompted an angry letter from Jim Clark of Anniston, Alabama. "Anyone who intentionally jazz up Bach," he wrote, "is either impossibly ignorant or insane!" New products this month included the Biggston BSD-200 cassette deck with Dolby B, the Technics SA-8000X four-channel receiver with an Acoustic Field Dimension control system, and the Norman Laboratories Triton speaker, said to be able to handle any amplifier designed "for reasonable home use." In test reports, Julian Hirsch examined the Thorens TD-160C record player ("Only a few expensive electronic-turntable systems have lower rumble") and the Dynaco AF-6 stereo tuner kit ("Even a novice kit builder should have no trouble assembling it").

Next! In Audio Q&A, a reader asked, "Please tell me whether it is okay to use the chromium-dioxide switch on a cassette deck for low-noise/high-output, super-dynamic, or extra-dynamic tapes." The pithy reply: "Try it and see what happens."

10 Years Ago

New products this month included the VKT550 VCR from RCA with (then new) VHS Hi-Fi, Ace Audio's 5000-SF electronic crossover for use with a subwoofer, the Genesis 20 two-way speaker with a vented particleboard enclosure, and "Stop Digital Madness" T-shirts from Sheffields Lab. In test reports, Julian Hirsch checked out the 130-watt-per-channel Carver receiver ("Anyone who is not prejudiced against receivers as a class could hardly do better."). The Czech-made NAD 5120 turntable ("To our knowledge the first hi-fi product from that country to be marketed in the U.S.") and the ADS L1290 speaker system ("This is one speaker that really is 'digital ready'.")

Lorena Bobbitt, where are you? Reviewing "Muscle Motion," a beefcake workout video by Men of Chippendales, Louis Meredith declared, "I haven't had so much fun with my TV set since Celebrity Challenge of the Species starring Morris the Cat, Seattle Slew, and Richard Simmons."

—Steve Simels
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