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.

Only BASF's exclusive Pure Chrome formulation can keep on delivering first-run sharpness, color brilliance, clarity, and sound reproduction—no matter how many times you replay it or re-record on it. So whether you want to record for keeps, or re-record night after night, don't trust your recordings to any other brand. For the video tape quality that never fades, make the switch to BASF Chrome.

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

CIRCLE NO. 15 ON READER SERVICE CARD
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.

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.

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.

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!
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

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

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

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REGULARS
EDITORIAL
LETTERS
NEW PRODUCTS
CLASSICAL MUSIC
POPULAR MUSIC
BASIC REPERTOIRE
THE HIGH END

COVER DESIGN BY SUE LEWELLYN PHOTO BY JOCK LEUNG; PHOTO OF PETE TOWNSEND BY BOB GUNN/STARFIRE

STEREO REVIEW JULY 1984

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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 to 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 me un-smug about being in the center of the artistic universe. Los Angeles is growing west of the Mississippi than east of it, Mount St. Helens has proved to 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.

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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.

One of the most essential criteria, for me at least, as to what constitutes true high-fidelity sound in a recording is reproduction of that lovely, silken sheen of the strings one hears in a live orchestral performance. Digital recording has not been able to capture it. In over forty years of record collecting, I have found only one that has: a Chalfont album of music by Vaughan Wil- liams and Elgar (C77.005)—an analog recording.

PAUL ASCHERL
Sheffield Lake, Ohio

Is there any truth to the rumor that sticking your hand into the drawer of a Compact Disc player and pressing PLAY will result in a digital readout of your elapsed lifetime and total life expectancy to the nearest second? Is it also true that the manufacturers are withholding this information because they're afraid a potential buyer might perform the experiment, find out he doesn't have long to live, and forgo the purchase?

BRAD GRUNNIWALDT
Custer, Wis.

William Burton's May article on the "Great Digital Debate" was an interesting cross-section of opinion, but not one shred of scientific evidence was presented by the participants to support their views. I single out the statement by Michael Tapes that "It's the emotion that digital takes out" as a prime example of purely superstitious audiophilia.

Those who believe it is "unmusical" or "unnatural" to represent a waveform as a series of numbers would do well to remember that all natural phenomena are governed by quantum mechanics. This means that there are no smooth, continuous functions in nature, only stepwise jumps from one physical state to another.

WARREN K. TENBROOK
Corvallis, Ore.

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 routs 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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Sansui Electric Co., Ltd., Tokyo, Japan

*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

THE SILENT TREATMENT
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.

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.

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.

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

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.

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.

AKG, the innovator in headphone design for over 30 years, has introduced such “firsts” as open air and passive diaphragm technology and the unmatched dynamic/electrostatic two-way system.

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... And for the finest stereo phonocartridges, ask your dealer about the AKG Transversal Suspension System.

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ANY WAY YOU PLAY IT.
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 XLI-S and normal bias XLI-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.

IT'S WORTH IT
Your VCR deserves Discwasher care as much as your records do.

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.

Trust Discwasher when it comes to maintaining your video investment. After all, we've never let you down before!

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For your free "Guide To Video Care" write to Discwasher.

CIRCLE NO. 10 ON READER SERVICE CARD
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 compand 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, 21/8 inches high, and 104.8 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.

Wonder-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 1243 pounds. Prices: BX-100, $349; BX-150, $495. Nakamichi USA, Inc., Dept. SR, 1101 Colorado Avenue, Santa Monica, Calif. 90401. Circle 122 on reader service card

LEVINSON PREAMPS MATCH ANY PICKUP

Universal phone stages with user-adjustable gain and input-loading options enable two new preamplifiers from Mark Levinson to match any phone 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 works 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 phone circuit of 0.014 percent 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 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 anti-phase (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 woof-er, 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 400 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 123 on reader service card
SLIM-LINE TWO-WAY CANTON SPEAKERS

Measuring only 3 1/2 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 8-inch polypropylene bass/midrange driver has layered-cone damping for a smoother frequency response. The range driver has a recessed tweeter. According to the manufacturer, Canton's GL 300F 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 13 1/4 inches, width 8 3/4 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 25 1/2 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 1G7. Circle 126 on reader service card.

EQUALIZER 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 auto reverse cassette player has locking fast-forward and reverse wind 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 5 1/2 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 low 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, 16 1/2 inches wide, 3 1/2 inches high, and 12 1/2 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.
Come to Marlboro Country.


Kings & 100’s: 17 mg "tar," 1.1 mg nicotine av. per cigarette, FTC Report Mar’84

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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.

**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 switch 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.

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3 Polk Winners in 3 Years The AudioVideo® Grand Prix is a prestigious annual competition for products that best exemplify the state-of-the-art in audio, combined with benefits and value for you the consumer. Polk speakers have won the Grand Prix for the last three years and this year Polk was voted as the number one loudspeaker manufacturer overall. Dedication to the quality approach in each and every Polk product is what makes the difference. Hear for yourself why Polk is #1.

Write or use the reader's service card for information on all our loudspeakers and the name of your nearest Polk dealer.

**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 ¼ 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.

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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 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 7⅝ x 2 x 4⅛ inches, and the nosepiece is 4⅛ x 1¾ 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-attuated 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-
nals listenable. If I could get stereo from 25 to 30 miles away using one antenna, with two antennas I could almost always get fully listenable
THE DTX-1000'S TAPE PLAYBACK WAS VERY QUIET, STEADY IN PITCH, BROAD IN FREQUENCY RESPONSE, AND GENTLE ON TAPE.

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 spotters and one or two "foop-foop" sounds as the tuner tried to keep the signal clean. But I heard almost none of the incredible "foop-foop" sounds 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 (standard BASF test tapes, -3-dB input): 43.3 dBf (40 µV).

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.

I was astonished at the constant flicker of the antenna indicator lights as the diversity system kept switching for a better signal.

HIRSCH-HOUCK LAB MEASUREMENTS

FM mono usable sensitivity (75-ohm input): 24.7 dBf (4.7 µV)
Mono 50-db quieting sensitivity (75-ohm input): 26 dBf (5.5 µV)
Stereo 50-dB quieting sensitivity (75-ohm input): 43.3 dBf (40 µV)
Tuner signal-to-noise ratio at 65 dBf: 68 dB
Tuner distortion at 65 dBf: 0.7 per cent
FM frequency response (−3-dB limits): 20 to 16,500 Hz
Stereo separation at 100, 1,000, 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 (−6-dB limits): 60 to 2,700 Hz
Tape-playback frequency response (standard BASF test tapes, −3-dB limits): 120-µs EQ—31.5 to 9,000 Hz; 70-µs EQ—31.5 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 CCIR-weighted peak; 0.08 per cent JIS-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): +9.2 dB at 100 Hz; +9.5 dB at 10,000 Hz
Amplifier line output into 1500 ohm load at clipping (measured at 1,000 Hz): 1.3 volts cold; 0.9 volt warm

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.
Circle 145 on reader service card

Winston. America's Best.

Excellence. The best live up to it.

11 mg. tar 0.7 mg. nicotine av. per cigarette by FTC method.
**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 13 1/2 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 periodic written update instructions of many compact speaker systems. Dimensions are 4 x 16 1/2 x 9 3/4 inches, weight 13 1/2 pounds. Price: $360. Proton Corp., Dept. SR, 737 West Artesia Boulevard, Compton, Calif. 90220.

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**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, 78.8 watts into 4 ohms, 130 watts into 2 ohms
- Clipping headroom: 1.68 dB
- Dynamic headroom: 2.53 dB
- Maximum distortion from 20 to 20,000 Hz, 20 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), 71.3 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
- 50-dB quieting sensitivity: mono, 15 dB (3.1 µV); stereo, 37.8 dB (40 µV)
- Stereo threshold: 35 dBf (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
- 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

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**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

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**Equipment Test Reports**

STEREO REVIEW JULY 1984 21
The 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 boominess.

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 Schottz 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

"The speaker demonstration room will be free in just a few moments, sir. Our manager uses it on occasion when he has to... uh... speak to one of our salesmen."
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 sent in warranty cards, 69% said they'd buy a Sony again. © 1984 Sony Corp. of America. Sony is a reg. trademark of the Sony Corp., 1 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 or 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.

The DP-1100B is finished in black and measures about 17½ x 12½ x ¾ inches. It weighs about 15 pounds. Price: $899. Kenwood Electronics, Dept. SR, 1315 East Watsoncenter Road, Carson, Calif. 90745.

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 edge.
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.
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.

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 equalization processing.

The DR-M44's conventional cassette well is illuminated from the rear to show the tape remaining. Its sette well is illuminated from the able each head's magnetic gap to be sized optimally as a function.

The DR-M44's conventional cassette well is illuminated from the rear to show the tape remaining. Its door is transparent, affording full label visibility, and removable for head cleaning and demagnetizing. Sensors inside the well detect the cutouts on the rear of the cassette shell and automatically switch the bias and equalization for the factory-reference ferric, CrO2-type, and metal tape formulations. The selections cannot be overridden. When tape types are changed, an illuminated rectangle beneath the fluorescent peak-level indicators changes position to show the recommended maximum peak-input levels.

To optimize the deck's internal adjustments for the slightly different needs of various tape brands, there is an AUTO TUNING START button that activates a built-in microprocessor program. This recalibrates the deck's bias and tape-sensitivity adjustments, stores the new settings in memory, and rewinds the tape to the point where the fine-tuning process began. The procedure takes only 7 or 8 seconds. Repeatedly pressing the MEMORY/REFERENCE switch during recording permits instantaneous comparisons between the factory-reference and optimized settings. While many decks have tape-optimizing systems, no other within our recollection permits a user to monitor their effects directly.

The DR-M44's dimensions are 18¼ x 4½ x 11¼ 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").

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DENON DR-M44 CASSETTE DECK

HIRSCH-HOUCK LABORATORIES

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):

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<tbody>
<tr>
<td>NR off</td>
<td>52.3</td>
<td>53.4</td>
</tr>
<tr>
<td>Dolby B</td>
<td>56.4</td>
<td>66.4</td>
</tr>
<tr>
<td>Dolby C</td>
<td>62.5</td>
<td>73.2</td>
</tr>
</tbody>
</table>

Tape used: Denon DX7 (Type II, chrome-equivalent)
IEC 0-Db distortion: 1.75 per cent
Meter indication at 3 per cent third-harmonic distortion: +3 dB

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HIRSCH-HOUCK LAB MEASUREMENTS

Hirsh-Houck-Ho Hick-Backs

Fast-forward time (C-60): 92 seconds
Rewind time (C-60): 91 seconds
Speed error: +0.5 per cent
Dolby tracking error: +0, -1 dB with Dolby B; +2, -1.5 dB with Dolby C
Wow-and-flutter: 0.023 per cent wrms; 0.036 per cent DIN peak-weighted
Line input for indicated 0-dB: 76 mV
Line output at indicated 0-dB: 0.76 volt
Meter indication at IEC-standard 0-dB: +1 dB

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):

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<tr>
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<tbody>
<tr>
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<td>Dolby B</td>
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</tr>
<tr>
<td>Dolby C</td>
<td>62.5</td>
<td>73.2</td>
</tr>
</tbody>
</table>

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):

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<tr>
<td>NR off</td>
<td>53.8</td>
<td>58.4</td>
</tr>
<tr>
<td>Dolby B</td>
<td>59.8</td>
<td>66.7</td>
</tr>
<tr>
<td>Dolby C</td>
<td>62.2</td>
<td>74.4</td>
</tr>
</tbody>
</table>

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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


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STEREO REVIEW JULY 1984

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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
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 absorbent "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 17½ inches wide, 15¼ inches deep, and 5½ 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-

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HIRSCH-HOUCK LAB MEASUREMENTS

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flutter</td>
<td>0.075% per cent</td>
</tr>
<tr>
<td>JIS-weighted rms</td>
<td>±0.1% per cent</td>
</tr>
<tr>
<td>DIN peak</td>
<td></td>
</tr>
<tr>
<td>Principal flutter frequencies:</td>
<td>Under 5 Hz with a 20-Hz component about 15 dB lower in level</td>
</tr>
<tr>
<td>Rumble</td>
<td>-40 dB unweighted, -62 dB ARRL weighted</td>
</tr>
<tr>
<td>Tracking-angle error: maximum</td>
<td>0.25 degree per inch at 4-inch radius</td>
</tr>
<tr>
<td>Effective tone-arm mass: 10 grams</td>
<td>-</td>
</tr>
<tr>
<td>Tracking-force calibration error</td>
<td>None from 0.5 to 1.5 grams; 0.05 grams low at 2- and 2.5-gram settings</td>
</tr>
<tr>
<td>Capacitance of connecting cable</td>
<td>25 picofarads (pF)</td>
</tr>
<tr>
<td>Total capacitance of arm and cable:</td>
<td>100 pF</td>
</tr>
<tr>
<td>Added switched capacitance: 100</td>
<td>or 200 pF, as marked</td>
</tr>
<tr>
<td>Speed adjustment range:</td>
<td>+4 to -3.6 per cent at 33⅓-rpm setting, +5.8 to -4.6 per cent at 45-rpm setting</td>
</tr>
<tr>
<td>Warp tracking ability: about average</td>
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</table>
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
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, it is nearly immune to shocks—resulting from striking or pounding the supporting surface (or even the turntable base itself). But if the support is not rigid—like the steel shelves on which we placed the unit—even a slow, gentle pressure on the supporting surface can rock the turntable on its soft mountings and cause mistracking or groove skipping. This is not a fault, nor is it unique to the T60—it is characteristic of any turntable suspension with a lightly damped or totally undamped infrasonic resonance frequency—but it is a possi-

**THE T60 IS A VERY SOLIDLY BUILT, SMOOTHLY OPERATING RECORD PLAYER. IF IT IS PLACED ON A RIGID SURFACE, IT IS NEARLY IMMUNE TO SHOCKS.**

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.
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

A truck you can live with.

GMC

GMC Truck & Coach
General Motors Corporation

GMC S-15 "4x4" PICKUP

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.


9 mg "tar," 0.6 mg nicotine avg. per cigarette, FTC Report Mar '81
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 televise 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

### 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

![Rear panel of RCA's first stereo TV](image)

devoted to turning 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 1.5,734 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.

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**Input**

**Fixed Pre-Emphasis**

**Variable Gain Element**

**Variable Pre-Emphasis**

**Low-Pass Filter**

**Clipper**

**Output**

expansion during reception is required with stereo TV if the received signal is to have high-quality audio. This "compression" or "companding" action is provided by circuitry originating from dbx.

More sophisticated than the dbx-II system used for home audio-tape noise reduction, the dbx stereo TV system operates in two stages: during transmission, one stage compresses the overall signal level and the other applies a variable pre-emphasis to the audio (see chart). The wideband amplitude compression reduces the dynamic range required in the transmission channels (the L - R difference signal and the SAP channel). The variable pre-emphasis system is a spectral compressor able to boost or cut high-frequency levels depending on the spectrum of the audio signals. A stereo TV receiver or tuner undoes all this compression with equivalent but opposite expansion.

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**The Coming of Stereo TV Will Have a Profound Effect on the Way We Use Our Audio and Video Equipment and on the Types of Components We'll Be Able to Buy.**

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**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 circuits in order to minimize sensitivity to interfering impulse noises while maintaining appropriate reaction times for music signals to prevent noise "pumping" and "breathing." A limiter is provided within the dbx TV encoder for preventing transmission-channel overload without introducing compressor/expander tracking errors. A sum-channel filter corrects for phase shifts added by the companding.

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STEREO REVIEW JULY 1984
Audio comes out on top in our laboratory tests of new VHS Hi-Fi video cassette recorders from Jensen and RCA

A special test report by Julian Hirsch

Audio philes 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 VCR’s 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)
- Selectable automatic level control (ALC) for normal-mode audio recording on longitudinal soundtracks
- Instant-recording mode (single-button selection of 30-minute recording periods for up to 4 hours)
- All usual VCR features, including fast forward and rewind, pause, high-speed search, single-frame viewing, digital-synthesis TV tuner including cable channels, etc.

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

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 auditorily equivalent. And even the measurable differences would probably not be heard without a direct A/B comparison.

Most of the differences we found could well stem from inevitable
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).
band, 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.

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.

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.

A 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.

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.

MOVIE CLASSICS: A BASIC LIBRARY OF SONIC SPECTACULARS

BY LOUIS MEREDITH

Belatedly, it seems to be dawning on everybody that half the fun of home video is aural. That being the case, here's a personal sampling of some of the best-sounding video movies you can get at the moment. I've selected them both for their demo value, as old-fashioned sonic spectacles to show off your equipment, and for their aesthetic value, where the sound significantly enhances your enjoyment of what you're watching. Most are available on both tape and disc. The sound is best in the LaserDisc versions.

SUPERMAN (THE MOVIE) (Warner Bros.). Another spectacle that loses something on the tube and a marvelous example of how sophisticated sound can restore your sense of wonder. Whether you're listening to the fustian John Williams score or a detonating A-bomb, the LaserDisc sound can convince you that you're back in the theater.

ALIEN (CBS/Fox). Sigourney Weaver's incomparable behind excepted, most of the visual impact of this outer-space spook show is lost on the small screen. The cacophonous stereo sound on my disc version did much to restore the shudders to director Ridley Scott's stylish Lovecraftian horrors.

APOCALYPSE NOW (Paramount). Notwithstanding Marlon Brando's peculiar performance as a beached (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.)

SWAN LAKE
(Video Arts International).
An extraordinary 1957 Bolshoi production of

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 Fadeychev 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 Vasilev) a Bach prelude. But consider these little bonues 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.

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 Balasa, conducted by Colin Davis.

4 AIDA
(Pioneer LaserDisc). The vastness of the 25,000-seat arena in Verona, Italy, is in itself impressive, but it is doubtful that in its 2,000-year history the site has seen a more spectacular production than this 1981 staging of Verdi's Aida. Conducted by Anton Guadagno, with sets and costumes by Vittoria Rossi and featuring singers Maria Chiara, Fiorenza Cossotto, Nicola Martinucci, and Giuseppe Scandola, this is grand opera at its grandest. The sound is astonishingly good when you consider the immense problems that must have faced the engineers in trying to capture it.

5 THE NUTCRACKER
(Pioneer LaserDisc). This American Ballet Theatre version of Tchaikovsky's Christmas perennial was produced, conceived, directed, and almost entirely choreographed by Mikhail Baryshnikov.

6 LA TRAVIATA
(MCA Home Video VHS and LaserDisc). Franco Zeffirelli's feature-film version of La Traviata takes Verdi's haunting opera out of the confines of the stage and lets it romp in magnificent outdoor settings and opulent interiors. Only the look is different from an ordinary opera production, for the score is faithfully adhered to by conductor James Levine and the Metropolitan Opera Orchestra and Chorus. Flora's ball is beautifully staged, and Teresa Stratas and Placido Domingo are splendid as Violetta and Alfredo. No opera video collection should be without this gem.

7 THE MIKADO
(Pioneer LaserDisc). The campy goings-on in Gilbert and Sullivan's The Mikado hammer home the American musical theater's debt to the famous nineteenth-century writing team. Pish-Tush. Pooh-Bah, Nanki-Poo—the names alone are irresistible, but this studio production, with William Conrad (star of TV's Cannon) in the title role, has a special charm and is excellently engineered. The soloists, London Symphony Orchestra, and Ambrosian Chorus are conducted by Alexander Faris.

8 THE SLEEPING BEAUTY
(Pioneer LaserDisc). This performance of the Tchaikovsky ballet by the Kirov Ballet was taped last year at Leningrad's Kirov Theater, but the production's lineage traces back to 1890, when the work was first performed on the same stage. Back then, the city was known as St. Petersburg, the hall was the Maryinsky Theater, and the resident corps was, of course, the Imperial Russian Ballet. Only the names have changed, and on these four LaserDisc sides the tradition continues with all the brilliance of old. Irina (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 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)
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 pressing 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.
WIDEY 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

Left, the complex crossover used in the dbx SFX-1.
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 radiation pattern right, and the rest will fall into place.

The derivation of the ideal radiation pattern was the first task in the design of the SFX-1 and the point where 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 lowest 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 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.

Figure 2: a typical speaker's pattern.
Davis also discovered that in order to maintain a "fused" image with music, the radiation pattern had to be held "across substantially the entire audio band." The frequency response, in other words, had to be flat regardless of the horizontal angle of radiation from the speaker. This was the hard part.
A typical front-firing speaker system (like most speakers on the market today) has a radiation pattern that looks something like that in Figure 2, which shows the radiation pattern in five frequency bands of one highly regarded front-firing three-way system. As the frequency changes, so does the radiation pattern, becoming narrower as the frequency rises. Although the frontal response is flat (all the curves meet on the front axis), the off-axis responses are definitely not. This behavior is typical of front-firing speakers, and Davis believes it is responsible for their characteristic "boxy" sound quality.
The problems in designing the dbx SFX-1, then, were how to create the desired radiation pattern, an unusual one to begin with, and how to maintain it over a wide range of frequencies using cost-effective, rugged, and proven dynamic drivers—which would ordinarily produce radiation patterns like those in Figure 2. The solution was to adopt a technique used in advanced radar and sonar systems: the phased array. A phased array is a multidriver system in which the frequency and phase response of each driver is manipulated so that the combined responses from all the drivers results in the desired radiation pattern. The drivers "interfere" with each other deliberately in a specific, controlled fashion.
In dbx's SFX-1, the fourteen drivers in each speaker are in a phased array. The complex signal conditioning necessary is performed by a very complicated crossover circuit. Nearly every driver must receive a signal that differs even from the other drivers covering the same frequency range.

The crossover circuit—and the acoustical analysis needed to specify the necessary crossover characteristics—could only have been designed with the aid of a computer, though in this case it was nothing more advanced than a bank of Apple home computers.
The outcome is the radiation pattern shown in Figure 3, measured from the finished SFX-1. It closely matches the ideal pattern, at least above 150 Hz (lower frequencies are emitted almost omnidirectionally but have little effect on the stereo image). It's nice to see...
Britain'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 the Los Angeles this month is Puccini's *La Bohème*, with the lead role to be sung by Domingo.

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 Britten 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 I & 2).

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

A multimedia performer, 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.

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.

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 *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.

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M el 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).

A merican 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

V an 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 Reaper") to film scores ("Popeye"). For the "Jump" album he adopted a musical-comedy sound. Martin Fydor Kipper's lyrics are hopping good fun, and the music is as hummable as anything coming out of Broadway this season. F.R.

T he name of Los Angeles-born soprano Arleen Augér 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, Augér 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.

T he 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.

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

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?
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 Grammies—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; Lassaia: Happy Ending; Be My Number Two; Heart of Ice. A&M SP 5000 $8.98, © CS 5000 $8.98; © CD 5000, no list price.

Claudio Abbado conducting the Chicago Symphony in the first recording CBS has done with this orchestra in a good many years.

Their is no razzle-dazzle treatment of the much-played and sometimes abused Second Concerto. Throughout the first movement in particular there is a feeling of warmth and intelligence at work on the part of both pianist and conductor. Both seem intent on bringing out the symphonic quality of the music without slighting its sentiment and brilliance. The hallmark of the finale is stated in the crispness of the quiet orchestral opening, and the celebrated horn solo later on emerges with unusual loveliness.

In the Paganini Rhapsody, Licad cuts loose with all the virtuosity at her command, but never at the expense of musicality. And Abbado, too, takes great care to achieve a perfect integration of balance, color, and textural detail throughout. The digitally mastered sonics are up to the highest CBS standard. This disc is a winner!

David Hall

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

Claudio Abbado and Cecile Licad: warmth, intelligence, and virtuosity
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. RCA AFI1-4998 $8.98. © AFK1-4998

LOU REED: New Sensations. Lou Reed (vocals, guitars); Peter Wood (keyboards), Fernando Saunders (bass), Fred Maher (drums); other musicians. RCA AFI1-4998 $8.98. © AFK1-4998

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 overemote 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

DISTINGUISHED CAST IN AN OUTSTANDING DIGITAL MEFISTOFELE

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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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The Fantasticks. Original Off-Broadway cast. POLYGRAM 821 943-2. "...fantastic." (November 1979)


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.
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.

**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.
XL-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.
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.

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 new 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 SW20), a 5½-inch two-way coaxial (Model 520), and a 4-inch single-cone full range (Model 410).

The physical and electrical operation of the CV series embody a host of novel features:

Within the compact housing surrounding the magnet structures of the coaxial models are individual, direct-coupled bridged output amplifiers for both the woofer and the tweeter. The woofer is driven by an 18-watt amplifier and an independent 12-watt unit drives the tweeter. In this way, each amplifier can be optimized for the specific frequency range and driver that it serves.

The result is a measureable reduction in intermodulation distortion and a more-than-noticeable increase in clarity. (The CV-SW1 subwoofer also has two amplifiers but they drive the dual windings of its voice coil. The CV-410 has a single built-in amplifier.)

The CV circuit is completely sealed in epoxy to ensure maximum long-term stability. The aluminum heatsink is kept well within safe operating temperatures even under the often hostile automotive environment by means of a unique (Patent Pending) and very efficient radiant cooling technique that also employs the woofer cone movement to supply additional air flow.

**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.

Audiovox

150 Marcus Blvd, Hauppauge. NY 11788 (516) 231-7750
CIRCLE NO. 6 ON READER SERVICE CARD
EHG Hi-Fi and HD-PRO—TDK upgrades its video tapes to meet the demands of a changing market

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 hardware manufacturers use TDK tapes as their reference standard and count on TDK for the development of new products. TDK also produces 75 percent of the rotary transformers used in video head drums, a fact that keeps TDK's research on the leading edge of video technology.

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. Designed to meet the demands of today's unerringly precise VCRs, TDK's EHG Hi-Fi delivers exceptionally picture quality and dynamic sound—even after hundreds of plays. Signal-to-noise ratio is up 4.5 dB in luminance and 5 dB in chrominance over TDK's current Standard tape. This means razor-sharp definition, extra-bright colors, and extra detailing and shading even in black and white. EHG Hi-Fi also offers cleaner, more natural sound, with improved frequency response and sensitivity up 1 dB over Standard TDK tape.

The second tape, HD-Pro, is without question the highest definition half-inch video tape on the market, boasting unequalled freedom from dropouts. And if you don't believe us, testing experts at Asahi Camera in Japan agreed, placing TDK well above its competition in this respect.

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 "SQ" 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 world wide 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 provide the advantages of digital capability in a less costly package, the intention 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—and cost—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. 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 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 DM220’s 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.

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 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.

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B&W
P.O. Box 653, Buffalo, New York 14240
CIRCLE NO. 47 ON READER SERVICE CARD
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 greys 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 subtonal 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 a complex arrangement of electromagentic coils mounted on the neck of the picture tube. Properly known as 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. When you see color fringes on edges or the wrong colors because the beams are off target, you’ll know that the deflection yoke isn’t all that it could be—and that you are not looking at a Proton monitor.

DETAIL.

When you see crisp sharp lines and hard clean edges, when individual strands of hair are visible, you know that a set is delivering fine detail. Two factors determine picture detail: (1) the size of the phosphorus dots on the picture tube face, and (2) the bandwidth of the monitor’s video section. Perhaps needless to say, we have paid particular attention to both areas. You should be aware that there are several different ways of specifying video frequency response and lines of resolution. As a result, it’s wiser to compare video pictures than video specifications.

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...
**THIS MONTH'S SUPER SPECIALS**

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**AUDIO RECEIVERS**
- AKAI AAR47 45 w Ch Digital: $219.95
- AKAI AAR42 50 w Ch Digital: $299.95
- AKAI AAR50 50 w Ch Digital: $279.95
- TECHNICS SA120 5 Ch Analog: $349.95
- TECHNICS SA130 5 Ch Analog: $379.95
- TECHNICS SA550 5 Ch Digital: $1099.95
- SANSUI 25000 5 Ch Digital: $799.95
- SANSUI 35000 5 Ch Digital: $799.95
- TECHNICS SL-BT105 Mini Transmitter: $119.95

**TURNTABLES**
- TECHNICS SL1200 Semi-Auto Turntable: $389.95
- TECHNICS SL1210 Semi-Auto Turntable: $389.95
- TECHNICS SL1310 Semi-Auto Turntable: $399.95

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**CARTRIDGES**
- SHURE V15 Type VS: $119.95
- SHURE V15 Type VM: $129.95
- SHURE V15 Type VMC: $159.95

**MICRO ACOUSTICS**
- SONY S5100M: $59.95
- SONY S5200M: $69.95
- SONY S5300M: $149.95

**AUDIO TECHNICA**
- 1120M: $119.95
- 1220M: $169.95

**TEAC**
- V909RX: $399.95

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**CASSETTE DECKS**
- TEAC V9000: $199.95
- TEAC V7000: $179.95
- TEAC V7500: $179.95

**RECORD WINDERS**
- AKAI: $49.95

**RECORD PLAYERS**
- TEAC PS812 Dolby: $99.95
- TEAC PS854M: $139.95
- TEAC PS878 A/B: $299.95

**SPEAKERS**
- TECHNICS SB30: $119.95
- TECHNICS SB712: $119.95
- JENSEN 1530: $199.95

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**COMPAKT DISC PLAYERS**
- CLARION 8550R: $179.95

**FREE SHIPPING**
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**RECORDING EQUIPMENT**
- PHONES/DIALERS

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**ANSWERING MACHINES**
- Panasonic KX-T1400: $99.95
- Panasonic KX-T1515: $119.95
- Panasonic KX-T2200: $169.95
- Demon Dialer: $179.95
- Volland: $199.95

**TAPES**
- Sony 3600: 120: $8.99
- Sony KX-120: 120: $7.99
- Sony KX-120: 120: $6.99
- Sony 3600: 90: $4.99
- Sony 3600: 60: $3.99

**MUSIC RECORDERS**
- Panasonic PV1200: $639.95
- Panasonic PV3200: $1450.95

**VIDEO EQUIPMENT**
- Sony HR2000: $1595.95
- Sony HR3000: $2595.95

**HOME COMPUTERS**
- ATARI 1040: $289.95
- Apple IIc: $279.95
- Commodore 1280: $249.95

**AUDIO TAPES**
- Sony HR2000: $1595.95
- Sony HR3000: $2595.95

**RECORDING MASTERS**
- Microcassette: $2.29

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**QUANTITY**

**MODEL NUMBER/DESCRIPTION**

**TOTAL**
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. ERATO/RCA © M 75 1133 three discs $32.94, © MCE 75 1133 three cassettes $32.94; © ECD 880373 three discs, 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’s whose rendition of “Ave: 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 episodic flavoring. The quintet in Act II is too fast and charmless, and certain later episodes (the “Bel officier” ensemble, for one) are a bit fussy.

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 in-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 the 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 com-passionate, 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.

Richard Freed

BEETHOVEN: Piano Concertos Nos. 1-5. Alfred Brendel (piano); Chicago Symphony Orchestra, James Levine cond. PHILIPS © 411 189-4 four discs $47.92, © 411 189-1 four discs $47.92, © 411 189-2 three cassettes $47.92; © 411 189-3 four discs $47.92.

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.
A superb tribute to Mozart's masterpiece and Glyndebourne! —If Disco Pressed in Europe/Direct Metal Mastering. DCUX-3953

Kiri Te Kanawa's soprano artistry in Annie Laurie, Comin' thro' the Rye, Greensleeves, many more. DS-38097

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Roistering performances of two satirical masterworks. Pressed in Europe/Direct Metal Mastering. DS-38095

Boito: Mefistofele (see Best of the Month, page 66)


Performance: Radiant. Recording: Excellent.

Brahms's two string quintets, both mellow, 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 Guarnieri 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 Lorenzengr (soprano), Iphigénie; Walton Groenroos (tenor), Oreste; Franco Bonisolli (tenor), Pylades; Dietrich Fischer-Dieskau (baritone), Thoas; Angelika Nowski (mezzo-soprano), Diane; others. Chorus and Orchestra of the Bavarian Radio, Lamberto Gardelli cond. ORFeo ♫ S 052833 three discs $4.19.


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

And this is an austere performance. Both Pilar Lorenzengr 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: Sonata 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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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); José Van Dam (baritone); BBC Symphony Orchestra; Members of the Ensemble InterContemporain, Pierre Boulez cond. CBS M 39023, © MT 39023, no list price.

Performance: Superb
Recording: Excellent

Rare is the Ravel album that can boast such riches as a Shéhérazade by Heather Harper, Jill Gomez's languid Mallarme Poèmes, Jessye Norman's barbaric Chansons madécasses, or José Van Dam's wry 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.

S.L.


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 sharp, dynamic shifts, or view them as 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-

tra, Mark Elder cond. ANGEL © DSBX-3957 two discs $26.98, © 4X2X-3957 two cassettes $20.98.

Performance: Fine
Recording: Very good

Compared with some truly bizarre efforts by certain stage directors who have invaded opera in the past decades, Jonathan Miller's much-heralded production of Rigoletto for the English National Opera appears relatively tame. Victor Hugo's basic plot is played out in New York's "Little Italy" around 1950. The libretto's Italian Renaissance characters remain Italians, but they have here been turned into a Mulberry Street mob.

Within Miller's concept, James Fenton's English translation must be judged a success. The language is natural, conversational, and occasionally enlivened with ingenious rhymes or (near-)rhymes. It is also singable, a few awkward bits of prosody notwithstanding, and the words are reasonably well fitted to Verdi's music. The performance is paced by Mark Elder with an expert hand in a traditional, unmannered fashion, a shade tamely in the first act but gathering momentum as the action progresses. Baritone John Rawnsley emerges as the recording's hero, as the Rigoletto should be. He reveals a smoothly produced lyric tone, full, well-centered, and even across the range. Tenor Arthur Davies also has his role well in hand, though his top notes are forced. The callow-youth image he projects is perfectly acceptable for medieval Mantua, but it requires more imagination than I possess to accept him as a modern-day capo.

Helen Field's Gilda is small-scaled, tremulous, but certainly adequate. The minor roles (Marullo, Borsa, Ceprano) are also filled no more than adequately, but there are notable contributions from Norman Bailey's solid Monterone, Jean Rigby's lusty Maddalena, and John Tomlinson's truly sinister Sparafucile (can his going rate of $80 per "hit" be realistic even in pre-inflationary 1950?).

G.J.
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, what you're left with is 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.

S.S.

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 affecting-ly 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 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 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.

Keeping up with the Smiths

T he 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, First, 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 affecting-ly 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

Explanation of symbols:

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on instead with what they do well—which is, let us not mince words, simply to grind out catchy, stylish, high-gloss, fluff, pure pop confections such as You Might Think and Hello Again. In fact, apart from their debut album, this is the friendliest-sounding record the Cars have ever made. To indulge in an automotive metaphor, it’s closer to a Chrysler than, say, a Lamborghini.

S.S.

GLORIOUS STRANGERS. Glorious Strangers (vocals and instrumentalists). Modern Life; Deception; Young and in Love; Move It Time; It's Hot; One Person/One Woman and You Others. Fun City GS-1 $6.98 (from Fun City Records, 340 East 22nd Street, New York, N.Y. 10010).

Performance: Avant-cute
Recording: Pretty good

This is an interesting little record but not at all what I expected. Wharton Tiers, whooss this show, was in the Theoretical Girls with Glenn Branca, and he’s been involved in a number of the more . . . er, rigorously avant-garde bands in the recent New York rock underground. This new project, however, verges on pop, though not of a type to give the Sheena Easonts of this world anything to lose sleep over. It’s an odd mixture of the slick and the primitive, with some extremely lush synth textures counterpointed by simplistic organ riffs, awkward drumming, and girl-next-door vocals by Carol Tiers. In its more melodic moments it could pass for the Shangri-Las if they’d been produced by Phillip Glass. Not exactly epochal stuff, but quirky and worth a listen.

S.S.

GUS HARDIN: Fallen Angel. Gus Hardin (vocals), vocal and instrumental accompaniment. Fallen Angel (Flyin’ High Tonight); Not Tonight I’ve Got a Heartache; I Pass; Are We Still in Love or Just Lonely; and six others. RCA CPL1-4937 $8.98, © CPK1-4937 $8.98.

Performance: Muzzled
Recording: A bit cluttered

As with her impressive debut mini-LP of last year, Gus Hardin’s first full-length album may not seem all that grabby at first, but after a few listenings it’s hard to get it off the turntable. Producer Rick Hall has once again taken her down to Muscle Shoals, Alabama, for that homogenized Southern funk sound, and it works to best advantage on the uptempo numbers, Hardin’s the First and I Pass. The latter sounds delightfully like a cross between an old Elvis tune and a Beatles number. Hall is also producing Terri Gibbs now, and at times here, especially with the use of the harmonica, it seems as if he’s merely rolling out his “Husky Female Vocalist” production formula No. 4. No matter how manufactured the arrangements get, however, Hardin’s rough-hewn voice cuts through, promising still greater things to come with just the right song and a lot more soulful production.

A.N.

JOE JACKSON: Body and Soul (see Best of the Month, page 63)

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 a professional model (that’s her on the cover of Conway Twitty’s “Lost in the Feeling”) and lived for a time in California, where she worked as a secretary to the pop group the Fifth Dimension. In other words, Naomi and daughter Wynonna have 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 O’Dell, Harlan Howard), and he worked out the arrangements to balance such traditional “instruments” as joys and washboards with the most contemporary of electric studio sounds. Thus, the Judds sound vaguely country (they pronounce “steel” as a two-syllable word), and their rural appeal is helped along nicely by songs with such back-fourty titles as John Deere Tractor. But there is also a decided-ly 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, I, 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 instrumentalists). 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 five 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 lubri-cate paean 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
This summer will see Midnight Oil's first American tour. For those who aren't lucky enough to catch what is arguably Australia's best rock band, the U.S. release of the triple-platinum album "10, 9, 8, 7, 6, 5, 4, 3, 2, 1" is as good as being there. It is, very simply, a remarkable record. Midnight Oil's reputation—such as it is—is that of a politically motivated heavy-metal band. Political it is; heavy it is not.

"10, 9, 8..." is as balanced and articulate as a string quartet, with meticulous arrangements of the band's impassioned music. Every chord from the twin guitars of Martin Rotsey and Jim Moginie, every beat, every sound effect makes a discrete, audible contribution. Nothing is wasted or redundant. The melody lines, sometimes carried on piano and synthesizer, but chiefly sustained by guitar and the vocals of Peter Garrett, tend to be long and unhurried but punctuated with slicing, distorted guitar effects. They have the quality of folk or street music electrified by barely contained anger.

Garrett, a frightening specter at six-and-a-half feet and completely bald, is the menacing force behind Midnight Oil's deadly serious message. One moment he declaims in somber tones, the next with the frenzy of a sane man in an asylum. While the album title is meant to suggest the countdown to nuclear Armageddon, the subjects range over big-power politics, 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 Hirrst, 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 instrumentals), vocal and instrumental accompaniment. 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 musicians 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 leaning at times toward a more electronic sound, as on Roctron, which features metallic 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.

TANIA MARIA

BRAZIL has yielded so many musical treasures from its rich blend of Portuguese, 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, Flora Purim, and Milton Nascimento, 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 series of excellent Concord recordings. Her fourth album, "Love Explosion," confirms her enormous talent.

In her varied roles as composer, singer, and pianist, Tania Maria spans such diverse musical horizons that her style might be called contemporary eclectic. Her music, brilliantly melodic and always accessible, sizzles, surges, and pulsates. Her piano style is solid, her voice lusty and full-throated. She intermingles hypnotic Brazilian rhythms and assertive jazz improvisations with sophisticated funk. And she is a masterly creator and interpreter of those bittersweet ballads so closely identified with Brazil.

But in singing and playing her way across much of the contemporary musical spectrum, Tania Maria fuses all these disparate ingredients into a richly compelling, highly personal whole. The music on "Love Explosion" is all her own, and it is wonderful. Phyl Garland

R.E.M: Reckoning. Peter Buck (guitar); Mike Mills (bass); Bill Berry (drums); Michael Stipe (vocals). Harborscoat; 7 Chinese Brothers; S. Central Rain; Pretty Persuasion; and six others. IRS SP-70044 $8.98, © CS-70044 $8.98.

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 critics' 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 rendered unintelligible by Michael Stipe'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 alien than it really is by the low-tech production. That "Reckoning" just seems to get better—if not more fathomable—with repeated listenings means R.E.M. can expect the same enthusiasm from listeners that it has won from critics. M.P.
AND THE SHIP SAILS ON. Original-soundtrack recording. Mara Zampieri, Nucci Condó, Giovanni Bavaglio, others (vocals); orchestra. MILAN A 228 $4.99, © A 228 $4.99 (from Musicrama Record and Tape Distributors, P.O. Box 1275, Long Island City, N.Y. 11101).

Performance: Fine
Recording: Good

Federico Fellini's best films have always possessed a dreamlike quality, none more so than his latest, And the Ship Sails On. This delightful mixture of fantasy, comedy, and music is set aboard a ship crowded with admirers and/or colleagues of a recently deceased diva and sailing through a cardboard sea just before the First World War. Most of the music derives from Rossini and Verdi, and it is carefully performed by the vocalists and orchestra in a tradition of Palm Court gentility. While this approach may not serve the musical interests of the composers, it does perfectly frame Fellini's ecstatic vision of the world of the grand salon, a world that vanished totally not even the good one.

RUMBLE FISH (Stewart Copeland). Original-soundtrack recording. Stewart Copeland (instrumentals); Stanard Ridgeway (vocals, harmonica, string synthesizer); instrumental accompaniment. A&M SP-6-4983 $7.98, © AAM-6-4983 $7.98.

Performance: Accomplished
Recording: Nice

I haven't seen Rumble Fish, which appears to be the latest installment in Francis Ford Coppola's plan to film the collected novels of S. E. Hinton, but be assured that its score is not exactly Alexander Nesky. The Police's Stewart Copeland, who tinkered it into shape, has a fusion background that he has only fitfully kept under wraps in the past. Here he doesn't so much re-create the style of Curved Air—the hippy jazz-rock band where he first learned the music of the spheres—as come up with a contemporary equivalent. It's all eclectic in the extreme and extremely well played (Copeland does nearly all the instrumental work, not just the drums), but basically it's the sound of a musician warming up. The tracks could be rhythm jams the Police abandoned before turning them into actual songs. High-class noodling—nothing more, nothing less.

TO BE OR NOT TO BE (John Morris - Mel Brooks). Original-soundtrack recording. Anne Bancroft, Mel Brooks, others (vocals, dialogue); orchestra. AN- TILLES 8 ASTA 2 $8.98, © 8 ASTA 2 $8.98.

Performance: Inimitable
Recording: Mostly good

What you think about To Be or Not to Be probably depends on your degree of affection for Mel Brooks and/or the old Ernst Lubitsch/ Jack Benny/Carole Lombard original that the movie is based on. Speaking as a Brooks fan, and as somebody too young to have experienced the Lubitsch Touch the first time around, I found the remake charming and in no way a violation of a (near) classic. This new soundtrack album is a hybrid; it includes all the musical numbers (including everybody's favorite, the Brooks/Anne Bancroft Polish version of Sweet Georgia Brown), along with healthy chunks of dialogue. It also includes, as a bonus, a shortened version of Mel's current rap single, which might be described as Grandmaster Flash meets Field Marshal Goering. Probably you won't play the album as often as either "Thriller" or Bruno Walter conducting Mahler's Ninth, but it's fun nonetheless.

THE VHS HI-FI SOUND QUALITY IS BETTER THAN THAT OF THE FINEST ANALOG TAPE RECORDER US ED 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 studio-quality audio recording. So far in high-fidelity VCR's, most of the fidelity is sonic. Let's hope the picture can catch up.

For more information on the Jensen AVS-6200, write to Jensen Sound Laboratories, Dept. SR, 4136 North United Parkway, Schiller Park, Ill, 60176. For more on the RCA VKT-550, write to RCA, Dept. SR, 600 North Shore Drive, Indianapolis, Ind. 46201.
COMPATIBILITY

(Continued from page 53)

components can theoretically deliver since some compromise is almost always necessary. Of course, there are some obvious caveats, such as being aware of any special positioning requirements a speaker may have before buying a pair. If the speakers are designed to sound best on free-standing pedestals, for example, don't place them on shelves against a wall.

TURNTABLE/ROOM

There is a potentially serious record-player compatibility problem that has nothing to do with the usual turntable specifications, such as rumble, flutter, or speed variation. It is never specified by turntable manufacturers or anyone else, probably because there is no established way to measure it or to determine its importance to a particular user. I am referring to a record player's susceptibility to external vibration originating from footsteps, jarring, or player's susceptibility to external vibration. Sometimes placing the turntable on isolating mounts can help, but the best treatment is prevention: keep the turntable well away from the speakers and other sources of vibrations. This may require some trial and error in the placement of the components.

THE BOTTOM LINE

These days most name-brand components will work well with each other without any extraordinary measures to ensure their compatibility. But you do need some basic understanding of what hi-fi components 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 trouble spots are likely to be, you can concentrate on them and stop worrying about the rest of the system. 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 another article!
A message about the dbx SOUNDFIELD ONE:

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.

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 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 +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 +2 dB from 180 to 23,000 Hz at a 45-degree angle inward from the front of the speaker. 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 SFX-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 the 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 reference to 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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no other word) than any other band in the world. It's nice to have them and the punk scene they exemplified documented so well. No stereo yet.

8 THE LAST WALTZ (Warner Bros.). The Band's retirement concert, with great guest performances by everybody from Van Morrison to Muddy Waters, shot with old-fashioned MGM elegance by Martin Scorsese. 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 delicious 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 Hits, from a band whose ideas have always been most cogently expressed in visual terms. The best of all the current rock video packages by a mile.

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

MUST-HAVE'S
THE GIRL CAN'T HELP IT starring Little Richard, Eddie Cochran, Gene Vincent, Fats Domino, and Jayne Mansfield.

Riot on Sunset Strip with Vincent, Fats Domino, and Aldo Ray as the cop.

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.

4 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

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**MUSIC VIDEOS: SONIC SPECTACULARS**

(Continued from page 48)

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**MUSIC VIDEOS:**

ROCK & ROLL (Continued from page 48)

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6 THIS IS ELVIS (Warner Bros.) The King, from white heat at nineteen on the Milton Berle Show to blubbery self-parody and grisly death. This is more than a rockumentary—its 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 time on white teen rock fans who is the Rude Boy of the title. But every time it cuts to the band the energy becomes close to riveting as you'd expect. A backstage semi-documentary, this (Columbia). A backstage semi-documentary, this (Columbia). A backstage semi-documentary, this (Columbia). A backstage semi-documentary, this...
remarably effective stereo soundtrack that probably hasn't been heard since the film's initial release. Best moment: when the steel shutters on Dr. Morbius's house slam shut in sequence and the sound moves from one speaker to the other.

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 most impressive stereo version offers some of the time, the special longer version is worth buying one of the loveliest ever.

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 (Continued from page 50)

Kolpakova and Sergei Berzhnoi dance the leading roles, and Viktor Fedotov conducts. Sound and light 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 Vasiliev 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 old 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 (AGLI-5210, © AGK1-5210). An outstanding mixture of familiar and unfamiliar titles is served up by Riccardo Chailly (London © LDR 71034, © LDR5 71034, © 400 049-2). Abbado's album is nearly as fetching (RCA ARL1-3634, © 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 34585) or Philippe Entremont on tape (CBS © MT 35851). Anyone who really wants the Ogden Nash verses should buy the original recording in which Noël Coward recites them with André Kostelanetz conducting (Oy- disse © 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. Entre- mont's older version with Ormandy (CBS MS 6778) is superior to his re-make with Plasson, 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 © LDR 71090, © LDR5 71090, © 410 201-2), but Munch's 1959 Boston recording, re-released in RCA's half-speed remastering, is still a contender for top honors (ARP1-4440, © ARE1-4440).

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, © PMC-7177). There are appealing recordings of the sextet version by the Ramor Quartet and friends (Turnabout TV 37012, © CT-7012) and from the Santa Fe Chamber Music Festival (Nonesuch 0-1-79028, © 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 Jo- chum's powerful, heartfelt Boston performance (DG 2530 318). Also exceptional are Böhm's live Vienna remake (DG 2531 373, © 3301 373), Klumper- er's (Angel RL-32038, © 4RL-32038), and the latest by Karajan (Angel SZ-37544, © 42S-37544, or in SE-3862).

SCHUBERT: Symphony No. 9, in C Major ("The Great"). The Munch/Bos- ton 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 Rögner's provocative, grand-scaled digital recording (Denon © OB- 7350/51-ND, © 38C37-7035). Kara- jan'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).
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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, somehow 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 set-up, 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 of these multimedia presentations. Courtesy of Kloss Video, Sony, Fosgate, SSI, and Warner Brothers, I was able to play Beta Hi-Fi movie tapes at home for several months last year. The experience rendered day-to-day reality intolerably drab for a while, but it did absolute wonders for my social life. Were it not for a while, but it did absolute wonders for my social life. Were it not that projection TV's don't work very well when the sun is out, I'd have had permanent boarders. So don't overlook video as you plan your home-entertainment system. Otherwise, you may find yourself becoming somebody else's permanent boarder.

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