

SPECIAL: EUROPEAN AUDIO

NEW ROCK FROM EUROPE

HOW TO GET STEREO TV

HOW TO CARE FOR **VIDEOCASSETTES**

LAB TESTS:

TANDBERG TPA-3016A

AMPLIFIER AND

TCA-3018A PREAMP

JAMO CBR 120 SPEAKERS

REVOX B215 TAPE DECK





WE'VE JUST EXTENDED OUR DYNAMIC RANGE,

and the distance between us and everybody else.

Introducing the new Sony UX series of tapes. At last, tapes now in a class with today's improved



cassette recording technology and music sources. Now, whether you record on Sony UX or the

incomparable Sony UX-PRO, you'll' be using tapes with finer and more evenly dispersed magnetic particles, along with improved coercive force to hold those particles even better than before.

For an example of what that means to you, take UX-S: its priced equivalently to comparable cassettes, yet delivers sound comparable to their high-end Type II tapes.

And when you take
UX-ES, you enter a realm that belongs entirely

to Sony. With a gauss measurement of 2,000, UX-ES comes in with dramatically higher specs

than any music tape.

But our new UX-PRO goes UX-ES one better by including enhancements even in the cassette housing. We developed a 3-plate, high-precision shell. And we created a unique ceramic tape guide with an amazing ability to absorb vibrations. It

to absorb vibrations. It virtually eliminates modulation noise. The result gives you the finest magnetic medium in the quietest cassette housing Sony has ever made.

Now you have four new Sony UX Type II tapes to choose from. And four ways to experience the thrill of leaving the competition far behind.







Taken on face value alone, this is the most remarkable car stereo in the world.



500Hz

1kH

TUNING

250Hz







DOWN

Introducing the phenomenal Kenwood KRC-999 cassette tuner. If the face plate isn't enough to make your jaw drop, wait 'til you hear the way the 999 sounds. And performs.

It's the most advanced car stereo ever made.

Period.

"Sure," you say, "I've heard that before." But how many car stereos have you heard that are driven by a 16K ROM computer?

A computer that lets you customize the sound to suit your car's environment.

And pre-set electronic volume levels.

And automatically seek out

a track anywhere on a side.

And scan the first five seconds of every cut.

And take stations with the strongest signal and automatically program them into memory.

Heard enough?

How about the lowest signal to noise ratio available. Metal tape frequency response of $20 \sim 22.5 \text{k} \ (\pm 3 \text{dB})$. A 7-band graphic equalizer that instantly converts to a spectrum analyzer.

Or an automatic azimuthadjusting hyperboliccontour tape head. And three drive motors.

Yes. The beauty of the KRC-999 is more

than skin deep. It represents the culmination of 25 years of superior audio technology from Kenwood. Consider it our anniversary present to the world

For the Kenwood dealer nearest you, call 1-800-CAR SOUND.

KENWOOD STEREO FOR YOUR CAR



of music.



Enter the World of Digital Technology Radio Shack's Command Performance Receiver

The Real stic® STA-780 receiver puts precision control and cynamic audio power at your fingertips. The digital-synthesized tuner features a search mode that lets you scan up and down the FM and AM bands. The system stops at each station and locks it on-channel, automatically skipping over weaker stations. It also provides you with a feather-touch control bar for manual tuning and a computerized memory to store six FM and six AM stations for instant recall. Exact station frequencies are shown on the digital fluorescent display. The STA-780 bossts a full array of 27 controls including tape moritor, loudness and subsonic filter. And 21 LED function indicators keep you in complete command. The amplifier delivers the power to get the most from today's digital audio equipment. 45 watts per channel, minimum rms into 8 ohms from 20-20,000 Hz, with no more than

0.08% T-ID. You can connect a compact-disc player, TV-sound source, tape deck, turntable and two pairs of speaker systems. All this for just \$349.95. Come in for a test-listen.

Radio Shaek

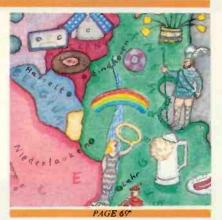
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High achievement in both analog and digital music reproduction is represented by the European-made components on our cover: the Thorens Phantasie turntable with Ortofon MC Super cartridge and the Magnavox CDB850 Compact Disc player from Philips. Table courtesy of Zona.

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Hear What You've Been Missing

Introducing DPD™ from Proton

If you're running that terrific new CD player off an amplifier or receiver that's three to five years old, you're missing out on a great deal of clean, uncompromising sound. Most amps of that vintage just can't create the extra headroom that's necessary for accurate digital reproduction. Every time the music hits a peak, your amp will be gasping for breath. And you'll definitely hear about it. Unless you have a Proton 40 Series amplifier or receiver with our exclusive, patented DPD circuitry.

Reserve power in an instant

DPD stands for Dynamic Power on Demand™. Designed for the increased demands of today's digital audio discs and hi-fi video sound, it utilizes a sophisticated, dual power supply which acts as a power

Proton's DPD™ Amp Bustains power 20 times 20 times 40 tim

reserve. During musical peaks, it delivers up to four times the amplifier's rated power for an amazing six dB of headroom. And DPD handles these boosts much more smoothly.

Plus, DPD sustains that dynamic power up to 400 milliseconds. More

than enough time for you to hear all the crisp, clean transient response you've been missing. From the pluck of a cello. To the crash of a cymbal. As faithfully as if they were being performed live.

Best of all, DPD gives you all of this extra power without your having to pay the extra price for a much larger amplifier.

So if you want totally uncompromising digital sound, you can't afford to compromise with your system. That's why you need Proton with DPD. With anything else, you'll be missing out.

For the Proton Audio/Video Dealer nearest you, call (800) 772-0172 In California, (800) 428-1006



Proton's acclaimed 40 Series Audio Components top to bottom: D940 Stereo Receiver with DPD™, 440 Stereo Tuner, D540 Stereo Amplifier with DPD™, 740 Stereo Cassette Deck and the 830R Compact Disc Player.

PROTON
Clearly the best.

737 West Artesia Blvd., Compton, Calif. 90220

by Christie Barter and Michael Smolen

TAXING TAPE RECORDERS

A U.S. Senate subcommittee has passed S 1739, a bill to put a royalty tax on all audio tape recorders. If the full Senate approves the bill, manufacturers' prices could be increased by up to 25 percent. The proceeds are to be given to record companies.

Subcommittee members who voted for the tax are Senators Charles Mathias (Maryland), Edward Kennedy (Massachusetts), Arlen Specter (Pennsylvania), Orrin Hatch (Utah), Patrick Leahy (Vermont), and Alan Simpson (Wyoming). If you oppose the tax, you should make your views known immediately to the committee members and-more important-to your own senators. You can get their names, addresses, and telephone numbers by calling the Audio Recording Rights Coalition: 1-800-282-TAPE.



THE CAT'S MEOW

Musical cat lovers who were disappointed at the dogs' victory in this year's Chicago Symphony Radiothon should be pleased to know that the prizes in the 1986 Meow Off, sponsored by Meow Mix cat food, will include a concert date for the winning cat with full orchestra at Alice Tully Hall at Lincoln Center in New York this fall. That engagement and a cash prize of \$25,000 will go to the cat judged to have the most musical meow. Rules for entering appear on the back of Meow Mix boxes. Entries must be received by July 31. Six regional winners will be announced in August.

ANALOG TO CD

London Records puts the label ADRM on its Compact Discs that have been derived from analog masters by the company's analogto-digital remastering process.

This process includes digital reediting by electronic means, which results in a master tape with superior sonic quality. The master tape can then be used to produce either a CD or an LP.

The latest ADRM Compact Disc releases range from an album of symphonic music by Franck and Schumann conducted by Wilhelm Furtwängler and recorded in 1951 to Strauss's Alpine Symphony conducted by Sir Georg Solti in a 1979 recording. A series of ADRM LP's is scheduled for this fall.

TECH NOTES

International Jensen, a division of Beatrice and the parent company of Jensen, Advent, Phase Linear, and Discwasher, is reported to be no longer up for sale. . . Sanyo Electric is merging with the related company Tokyo Sanyo, which does most of the manufacturing for Fisher. The new company will have combined capital stock said to be roughly equal to that of electronics leader Matsushita. . . . Sandy Gross, vice president of Polk Audio, has announced that in addition to opening a new production facility in Baltimore, Maryland, the company will soon be going public. . . Altec Lansing Consumer Products, recently acquired by Sparkomatic, has issued a new line of speakers for home and car. . . . In the wake of the 8mm/VHS-C format war, the 8mm Video Council has been formed to promote the 8mm videocassette format. Charter members include Aiwa, Canon, Embassy Home Entertainment, Kodak, Kyocera, Paramount Home Video, Sony, and Warner Home Entertainment. . . Shape Optimedia, a division of Shape, Inc., the largest independent manufacturer of audio cassettes in the U.S., is moving into CD production and plans to have the capacity for 20 million discs per year by the end of 1987.

CROWNING ACHIEVEMENTS

Bib Audio Video Products, a British accessories manufacturer. has celebrated the sale of its millionth VE-40 video head cleaner. The company has been named one of the winners of the 1986 Queen's Award for Export

Achievement in England. A new product from the company is the Bib Twoshot, a disposable head cleaner for audio tape decks.

HOLLYWOOD NOTES

MCA Records has released a half-dozen popular MGM film soundtracks that have been absent from the LP catalog for a good while. Among them are The Wizard of Oz, Singin' in the Rain, Easter Parade, and Gigi. . . . The Eastman Kodak company has begun distributing a number of Embassy Home Entertainment video titles on 8mm cassettes, including A Chorus Line, The Cotton Club. and This Is Spinal Tap.

NEW TECHNOLOGY AND OLD

Among the new products on view at Summer CES in Chicago was one that uses old technolgy in a new way. It is "The Tempest," a Compact Disc player that relies on tubes (!) rather than transistors. Developed by California Audio Labs of El Toro, California, it is scheduled to be available in July. Price: \$1.895.

In contrast, Finial Technology of Sunnyvale, California, is using brand-new technology for an old purpose. Finial showed a prototype of its high-end turntable. which uses lasers instead of a mechanical stylus to play vinyl LP records. The company expects to begin manufacturing the turntable by the end of the summer. Price: \$2,500.



Matthew Polk's Awesome Sounding SDA-SRS & SDA-SRS 2



Matthew Polk, the loudspeaker genius, with his Audio Video Grand Prix winning SDA-SRS and latest technological triumph: the extraordinary SDA-SRS 2, honored with the 1986 CES Design & Engineering Award.



In 1986, it still is.

If you wanted good sound in the early days of hi-fi, you cut a hole in your wall and mounted the woofer inside. Or you built a Flared Horn the size of a refrigerator. Or bigger.

In 1954, a man named Edgar Villchur found a better way. In building the world's lowest-distortion low-frequency speaker, he replaced crude mechanical suspensions and giant cabinets with a cushion of air in a small, tightly sealed box. Called "Acoustic Suspension," the new loudspeaker reduced distortion by a factor of 10. And it was the first high fidelity speaker you could fit on a bookshelf.

To build his Acoustic Suspension speakers, Villchur founded a new company: Acoustic Research. Overnight, AR products became the most revered, most sought-after, most im tated speakers in history. In fact, over 70 different speaker manufacturers are using AR's Acoustic Suspension design today.

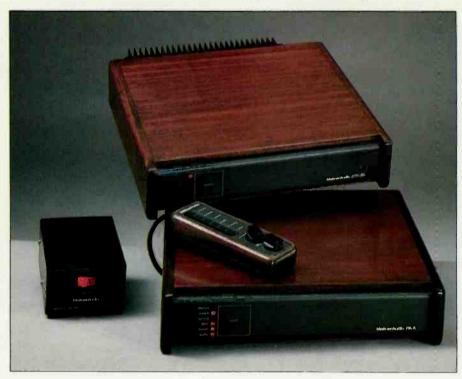
Since 1954, AR has substantially improved the original Acoustic Suspension speaker. By inventing the dome tweeter, introducing magnetic fluid cooling, building 3/4" high-density enclosures, eliminating catinet diffraction, and solving the problem of speaker/room interface.

AR's new BXi Series Loudspeakers for 1986 are the most highly refined speakers on today's market. And they should be. It took us 32 years to make them.

ACOUSTIC RESEARCH

We speak from experience.

CIRCLE NO. 18 ON READER SERVICE CARD



Meitner Audio

The wired remote control of the Meitner Audio PA-6 preamplifiershown with its separate power supply (left) and the STR-50 power amplifierswitches inputs from a turntable, tuner, auxiliary source, and tape deck. Muting, phase, volume, and balance can also be adjusted with the remote. To eliminate the intermodulation distortion of potentiometers and switches, the preamplifier uses a voltage-controlled amplifier for volume and balance. Users can select from three interchangeable phono-preamp sections: for movingcoil cartridges, for medium-resistance and moderate-inductance cartridges, or for moving-magnet cartridges. Price: \$1,650 in mahogany finish.

The STR-50 stereo power amplifier is rated for 50 watts per channel into 8 ohms. The amplifier has a Floating Charge Current Power Supply that is said to provide a deeper, wider soundstage and extended bass response. Price: \$1,250. Imported by Assemblage, Dept. SR, P.O. Box 815, Branford, CT

Circle 120 on reader service card

Yamaha

Yamaha's DSP-1 Digital Sound Field Processor can create a number of acoustic environments and then vary them to suit the tastes of home listeners. The new processor maintains the wide dynamic range and high signal-to-noise ratio characteristic of the Compact Disc format. The DSP-1 utilizes data (stored in read-only memory) gained from the sound-field analysis of highly regarded acoustic environments to re-create or synthesize the original sound field of anything from a jazz club to a cathedral. Other features include decoding circuitry for Dolby Surround soundtracks, with a voice-stabilizing center channel,



digital logic decoding, and a subwoofer output. Price: \$849, including a fullfunction remote control. Yamaha,

Dept. SR, 6600 Orangethorpe Ave., Buena Park, CA 90620. Circle 121 on reader service card

Sony

Sony's new audio cassettes have improved tape formulations, smoother tape handling, and wider windows in the cassette shell compared with the company's previous tapes. For more even distribution in the new binder formulations, the magnetic particles have been made finer and more uniform in size. The cassette shells are precision molded to absorb vibration. The wider windows make it easier to check tape motion and the tape left on each hub.

The two Type I tapes, for use with normal bias and equalization, are HF, with Super Crystal Gamma particles in high-polymer binder, and HF-S, which has even more uniform particles



for extended frequency response. There are four grades of high-bias Type II tape: UX, UX-S, UX-ES, and UX-Pro. UX-Pro has a ceramic tape guide to reduce modulation noise. The Type IV tape, Metal-ES, has a "super rigidity" shell and parallel spring pad for less modulation noise. Prices for C-90 length cassettes: HF, \$3.15; HF-S, \$4.25; UX, \$5.50; UX-S, \$6.95; UX-ES, \$7.95; UX-Pro, \$9.95; Metal-ES, \$11.95. Sony, Dept. SR, Sony Dr., Park Ridge, NJ 07656.

Circle 122 on reader service card

FOR LIFE'S GREAT PERFORMANCES.



The most beautiful music in the world begins with three simple words: To. Without And.

These three simple commands make the new AKAI CD-A70 the most easily programmed CD player you can buy. At any price.

AKAI calls it Natural Logic

AKAI calls it Natural Logic Operation. And here's how it works.

To hear, for example, tracks 1 thru 9, while skipping 3 and 5, you simply enter the following: 1 76 9 Without 3 And 5.

It's fast, simple and foolproof. And the full-function wireless remote control lets you manage the CD-A70's talents from a more comfy command center. Like your couch.

Best of all, the performance

is flawless. Thanks to an advanced 3-beam laser pick-up. 16-track memory. A Random Play System. Digital filter. Subcode terminal.

Plus an insulated floating mechanism and special cabinet to eliminate resonance.

The AKAI CD-A70.
Nobody makes great performances easier to enjoy.

Visit your AKAI dealer soon for an audition. Or write to: AKAI America, P.O. Box 6010, Compton, CA 90224-6010.

CIRCLE NO. 46 ON READER SERVICE CARD

The Pioneer* SD-P40 is not a projection television. It is a projection *monitor*. The first of its kind.

And in one masterstroke, all—not some, but *all*—of the compromises associated with projection television have been eliminated.

In fact, the SD-P40 is not merely far

For the first time, a true skin tone is achieved in the presence of a vivid green. At last, color compromise is eliminated.

The exceptional performance of the Pioneer SD-P40 is the result of several major technological advances developed by Pioneer engineers over the last 3 years.

PIONEER INTRODUCES THE WORLD'S FIRST PROJECTION MONITOR.

superior to *any* other conventional projection system, it is also superior to all but a few direct-view monitors.

450 LINES. AND THAT'S THE BEGINNING.

The horizontal resolution on the SD-P40 is more than 450 lines.

The brightness is more than 300 footlamberts. It is actually brighter than any direct-view system.

The contrast has a dynamic range more than twice that of conventional projection systems.

THE END OF BIG-SCREEN COMPROMISE.

Ambient light, one of the great problems in projection video, is no problem at all. In fact, there is less deterioration in contrast due to ambient light than in direct-view systems.

Focus, so much a problem in conventional projection systems, is sharp to the edges of the screen. Further, the picture is equally bright regardless of what angle you are viewing it from.

Blacks so often grow on con-

Blacks, so often grey on conventional systems, are rich while holding detail.

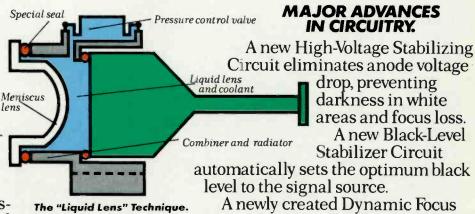
The fuzziness you're so used to seeing around white lettering and objects at high brightness, known as "blooming," is eliminated.

Color values are exceptionally accurate.

AN UNPARALLELED LENS. A REVOLUTIONARY LENS SYSTEM.

The lens itself is the largest projection lens ever developed for private use—with a maximum bore of 160 mm.

Even more significant is Pioneer's development of the world's first liquid-cooled *and* liquid lens system. Far superior to conventional liquid cooling, the *direct coupled* "liquid lens" is clearly the most accurate, efficient projection lens system ever devised.



Silicone rubber

Conventional

A newly created Dynamic Focus

Circuit guarantees sharp focus
to the edges of the screen.

And new High-Focus CRTs utilize not one but three electron lenses. These, combined with a newly developed Linear Tracking Focus System, result in a focal performance superior to conventional CRTs.

THE HEART OF A SOPHISTICATED AUDIO/VIDEO SYSTEM.

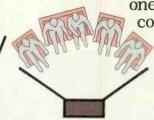
Inputs are provided for a LaserVision player

and two videocassette recorders, in addition to 139 cablecapable channels with 10-key direct access. There's an MTS decoder for stereo/SAP broadcasts, and a simulated-stereo processor. There's a built-in high-powered 12W + 12W Conventional

amplifier, with two built-in 65/16-inch speakers. There's a monitor output, and a TV output. There's even a variable audio output that lets you control volume through your hi-fi system by remote control.

seating

In fact, the entire system is controlled by



Our seating Finally, you can sit anywhere.

one 54-function System Remote control (which will also control

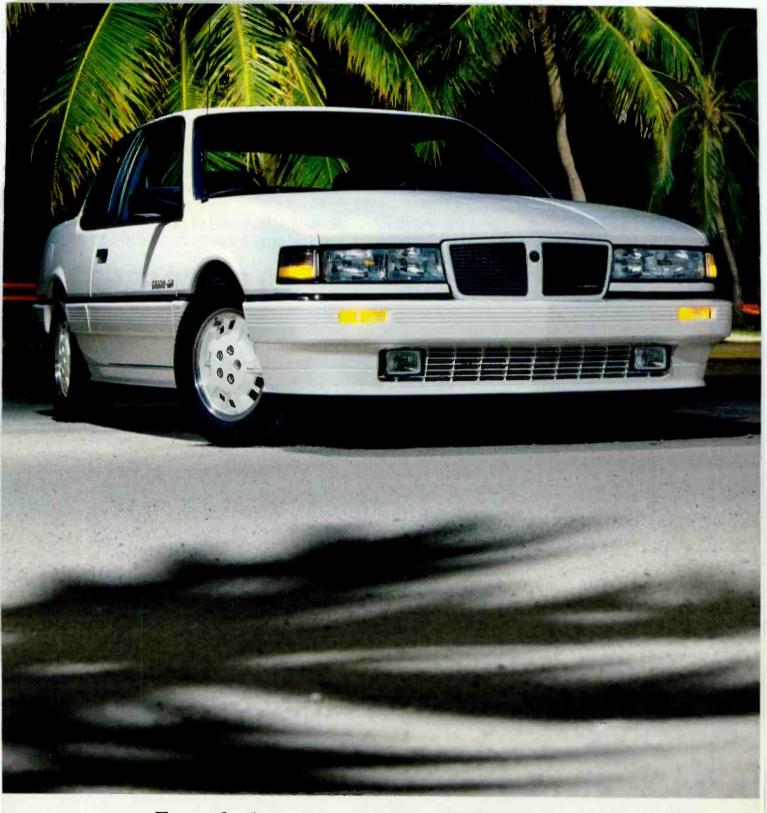
Pioneer LaserDisc[™] and VCRs bearing the SR symbol).

We could go on and on. Suffice it to say, all you have to do is see the Pioneer SD-P40 once, and you will suddenly understand the difference

between the world of projection televisions and the only projection monitor in the world.







Exceeds the minimum daily adult requirement for driving excitement.

Introducing Grand Am SE. Aerodynamic. Monochromatic. With a 3.0 liter multi-port fuel injected V6 and a rally tuned suspension that knows what to do with a road. Drive one often for fast relief from boredom.

PONTIAC GRAND AM WE BUILD EXCITEMENT





"The Genius of Matthew Polk Creates The Second Awesome Sounding Signature Edition SDA!"

Polk Audio's Extraordinary New SDA-SRS 2 is Here!

ow the genius of Matthew Polk brings you the awesome sonic performance of the SDA-SRS in a smaller, more moderately priced, but no less extraordinary loudspeaker, the SDA-SRS 2.

"Spectacular...it is quite an experience" Stereo R

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

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

"Exceptional performance no matter how you look at it"

Stereo Revieu

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

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

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

Julian Hirsch of Stereo Review summed it up well in his rave review of the SDA-SRS: "The composite frequency response was exceptional

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

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

"Literally a new dimension in sound" Stereo Review

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

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

Like the SDA-SRS, the SRS 2 incorporates: 1.) time compensated, phase-coherent multiple driver vertical line-source topology for greater clarity, increased coherency, lower distortion, higher power handling, increased dynamic range and more accurate imaging. 2.) a monocoque cabinet with elaborate bracing and MDF baffle for lower cabinet read-out and lower coloration. 3.) progressive variation of the high frequency high-pass circuitry for point-source operation and wide vertical dispersion. 4.) the use of small active drivers in a full complement sub-bass drive configuration coupled to a large 15" sub-bass radiator for extraordinarily tight, quick and three-dimensional mid and upper bass detail combined with low and sub-bass capabilities which are exceptional. The speakers are beautifully finished in oiled oak and walnut.

Other superb sounding Polk speakers from \$85. ea.

No matter what your budget is, there is a superb sounding Polk speaker perfect for you. Polk's incredible sounding/affordably priced Monitor Series loudspeakers start as low as \$85 ea. The breathtaking sonic benefits of Polk's revolutionary True Stereo SDA technology are available in all Polk's SDA loudspeakers which begin as low as \$395. each.

"Our advice is not to buy speakers until you've heard the Polks" Musician Magazine

The experts agree: Polk speakers sound better! Hear them for yourself. Use the reader service card for more information and visit your nearest Polk dealer today. Your ears will thank you.



1915 Annapolis Road, Baltimore, MD 21230



With Remy Thorens (right), whose company has entered its second century

Imported from Europe

RODUCTS from Europe have always had a certain cachet in the American market. The art works, antiques, fine wines, perfumes, and beautifully crafted contemporary products that European countries export have a certain aura of luxury and undeniable snob appeal.

This aura pervaded a recent ad for Programme Homme, a line of men's products from Lancôme, Paris, that were claimed to provide "state of the art skin care." One was Mousse à Raser Extraordinaire (translated in smaller type as Extraordinary Shaving Creme). The ad was appealing, but the products struck me as 95 percent luxurious packaging containing a little useful oil and a lot of hope. I'm sticking to ordinary shaving cream.

Many European audio products are beautiful objects to behold. Bang & Olufsen is justly proud of its many design awards from museums, and Canton goes to great lengths to put cabinetmaker finishes on its speakers, but these are not simply luxurious packages. Although the Thorens turntable on the cover of this issue is a beautiful object, it is backed up by a century of Thorens's experience and technological achievements.

Not all European products, of course, win design awards for their looks. A number of turntables from Northern European countries lack the sheer beauty of the B&O models and the Thorens Phantasie, but score very well on performance nonetheless. England, in particular, produces some loudspeakers that are rather clumsy looking but are highly esteemed by American audiophiles for the beauty of their sound.

Whatever you may think of the looks of European products, the survey of European audio technology by Peter Mitchell and Brad Meyer on page 68 should convince you that European countries are still in the forefront of audio research and development. See page 92 for news of imported European pop music.

In audio products beauty is not only skin deep. The double-blind tests we have conducted prove to me that the way we feel about a product strongly influences the way we perceive its sound. Trust and confidence (and hope) seem to enhance performance. And it's not surprising that there are many Americans who give extra trust to European products since it is from Europe that the majority of us imported our ancestors.

Stereo Review

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LOUISE GOOCH BOUNDAS Managing Editor

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WILLIAM BURTON Technical Editor

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If you can't afford it, spare yourself the heartache of listening to it.

We are all aware that money aside, it is an easy matter to upscale our quality of life, but difficult to lower it. In this regard, ignorance is bliss and strict abstinence is sometimes better than a taste of something finer that we can't have. So it is with Concord high-fidelity, high performance car audio. One listen, one taste, will significantly alter your demands for mobile high-fidelity. Uncompromising performance; the Concord story begins and ends with it. Concord's performance engineering over the years has resulted in a list of mesmerizing characteristics that, as you become aware of them, will change your perception of car stereo. For instance: A sound critics claim is the best they've ever heard in a car stereo—home high-fidelity sound.

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Radical Designs And Innovations By Magnat

While some manufacturers have been content with decades-old technology, Magnat ™ engineers have consistently developed radical new designs in their pursuit of the perfect loudspeaker.

1974 Magnat designs exclusive computerwound ribbon-wire woofer voice coils for greatly improved transient response and dynamic range.

1976 Magnat introduces their first speaker where all drivers use computer-wound ribbon-wire.

1979 Magnat develops revolutionary plasma high-frequency driver, which produces sound by modulating a small, controlled cloud of ionized air.



1982 Magnat's Plasma speakers win "Hi Fi Preiz," Germany's most prestigious audio award, and "Decibel d'honneur," France's highest award.



1983 Magnat develops a patented softmetal dome tweeter that is far more rigid than soft plastic or textile domes, but doesn't suffer from the high-

frequency resonances of other metal domes.

1984 Magnat designs Magnasphere ™ omnidirectional drivers. These ball-shaped, bafflefree transducers emanate sound in all directions. Magnasphere speakers receive a record three "Decibel d'honneurs".



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|ETTERS

American Audio

The June issue is outstanding indeed! I quickly flipped through all the pages, getting a load of the strikingly beautiful, and sometimes sensual, visual character of the magazine. No doubt about it, this is the good new STEREO REVIEW.

Reading the contents confirmed the magazine's evolution in the direction it has traced since the Fifties: the positive enjoyment of music and audio. The issue's celebration of American audio is fitting and proper, in a manner free of undue aspects of nationalism.

CARLOS E. BAUZA San Juan, PR

Despite criticisms from some factions of the underground press, an issue of STEREO REVIEW such as June 1986 still gives by far the greatest quantity of interesting reading per dollar of any audio magazine. Please keep giving us articles like the special report on "The State of the Nation's Audio."

RALPH GONZALEZ Philadelphia, PA

I was interested to read in the June issue that the Carver receiver is made in Lynnwood, Washington. On the back of my receiver, Mr. Carver spelled it with a "J," as in "Made in Japan."

WILLIAM M. DAVIS Dunwoody, GA

Although subassembly of the Carver receiver is done in Japan, final assembly and quality-control testing is done in Lynnwood, where Carver Corp. is located and where the designs for Carver products are developed. The "Made in Japan" sticker, however, is required by FTC regulations.

Car Stereo in the Box

Daniel Sweeney did a commendable job of surveying the trends in car stereo in his May article, "What's New in Car Stereo?" His comments about the various adaptors available for use of CD players in cars inspired me to create my own "adaptor," which would not sacrifice the sonic quality either of my Nakamichi TD 700 cassette tuner or of my newly purchased Sony CDX-R7. I purchased two Bensi boxes for them. which allow the units to be interchanged fairly easily and protect both from theft. Now I can listen to the best in both digital and analog recordings in my car.

NED FISCHER Winnetka. IL

Maxine Sullivan

I enjoyed June's long-overdue article on one of the great jazz vocalists, "Maxine Sullivan: An American Classic" by Chris Albertson. My only complaint is that the selective discography is too selective. Sullivan's finest recordings were done in Sweden from 1981 to 1984 on the Kenneth label with the Swedish Jazz All-Stars. Called "Maxine Sullivan: The Queen," Volumes 1, 2, and 3 have been imported into the U.S. by Zim Records and are sold through J&R Music World (23 Park Row, New York, NY 10038). Volumes 4 and 5 are still to be released. A must for every fan of Maxine's.

M. EISENBERG Brooklyn, NY

Fire Hazard

Larry Klein's advice in June's "Hot Wiring" item ("Audio Q. and A.," page 22) is dangerous at best. Any combustible item, such as neoprene insulating foam, placed within 18 inches of a radiating-type heater is a potential fire hazard. A better solution for running wires near a radiator is to use a noncombustible conduit such as those specified in the National Fire Protection Association Standards Nos. 13 or 24. As an audiophile and a firefighter, I feel compelled to correct Mr. Klein's misleading suggestion.

JOHN M. ARENZ Santa Rosa, CA

Mr. Klein did not specify neoprene foam, but we are happy to draw our readers' attention to this potential, but avoidable, hazard.

Sound Coverage

I would like to thank John Milewski for his June letter pointing out that your coverage of video recorders is getting out of hand. Your defense to this was that you "treat video from an audiophile's point of view." If that's the case, shouldn't you also run around the country testing the sonic qualities of new types of houses and apartments? The sonic differences between any two houses are probably greater than between any two audio components.

STEVE NESHAN Fort Lee, NJ

Audio Tape Measure

The May letter from Australia regarding the test equipment appearing in the photographs of products reviewed in your magazine was delightful. I was surprised, however, to find that the idea did not come from your test laboratory but from the production staff. Including the testing tape in the photos shows true inspiration.

I am enclosing an ad from a producer of testing equipment that both your production staff and your reviewing team should appreciate. For only \$17.95, you can get a Stanley Tools Powerwinder tape player. It looks like a tape measure but is actually a stereo cassette player. Included, of course, are "great-sounding headphones." Who said test equipment can't be both great looking and great sounding?

T. A. NOUSAINE Chicago, IL

Classist Epithet

I object to Alanna Nash's use of the word "Cracker" in her May review of the Elvis Presley video recording, "One Night with You." It is not an acceptable descriptive term. It is a derogatory classist epithet as unacceptable as any analogous racist term.

BONNIE SHAPIRO Fort Lee, NJ

Don't Stop the Music

I'd like to thank you folks for broadening my musical horizons. As a subscriber to STEREO REVIEW for more than a decade, I find the music reviews becoming more important to me than the hardware reviews—even though I'm in the electronics business. I am glad to see you've halted the trend toward cutting your music coverage in favor of the hardware. Other magazines are so into hardware that they lose sight of the whole point of the hardware: they can't see the forest for the trees, as it were.

RONALD LA CLAUSTRA Brooklyn, NY

Defining "Audiophile"

Recently, a friend and I were sitting in my apartment watching a Leave It to Beaver rerun or something similar. Glancing down at my coffee table, he saw an issue of STEREO REVIEW, which he picked up and proceeded to read. After a few pages he noticed that the word "audiophile" was used frequently, and he asked me what it meant. I wasn't quite sure myself, but the definition I gave him was: "An audiophile is a person who spends a great deal of his life and a great deal of money searching for the ultimate in audio equipment and sound quality, till finally one day he turns into an audio signal himself and slowly fades away, never to be amplified again."

How do *you* define "audiophile"? ROB LOUVIAK Columbus, OH

The American Heritage Dictionary of the English Language says: "a high-fidelity audio hobbyist." That's good enough for openers.

—Ed.

Germany's Number One Brand Of Speakers Is Now Available In The U.S.

For years the people of the United States have appreciated the quality of West German products. Automobiles by Audi, BMW, Mercedes and Porsche. Cameras by Leica. Home appliances by Krups.

But until recently, if you wanted to own the most popular highperformance loudspeakers from Germany—you had to go there.

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The four series of Magnat™ loudspeakers are now available through a small, carefully selected network of dealers in the United States:

The Monitor Series. Beautifully crafted, monitor-quality bookshelf speakers priced affordably from \$149 to \$229 each.*

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The Magnasphere ™ Series. The Magnaspheres use revolutionary ball-shaped, baffle-free transducers that emanate sound omnidirectionally. Their sound is so uncannily three-dimensional, they've won a record three "Decibel d'honneurs," France's most prestigious audio award. Priced from \$795 to \$1,245 each.*

If you're in the market for truly outstanding loudspeakers, visit your nearest dealer and audition Magnat. You'll hear why—in a country known for its quality products—Magnat outsells



In 1954, our Acoustic Suspension was the most significant innovation in loudspeakers.



Meridian

Meridian's M30 (shown), M20, and M100 active speaker systems have built-in power amplifiers, allowing them to be driven directly from a preamplifier or Compact Disc player. The source signals go through crossover networks that send the appropriate frequencies to separate power amplifiers for each driver. The speakers feature automatic music turn-on from a standby condition, switchable balanced/unbalanced inputs, and a range of response modifications to compensate for room acoustics. Maximum output is rated as a sound-pressure level of 106 dB for the M30, 109 dB for the M20, and 113 dB for the M100. All three speakers are rated to respond up to 20,000 Hz ± 3 dB. The M30's response goes down to 38 Hz ±3 dB, the M20's to 35 Hz, and the M100's to 33 Hz.

The M30 is finished in black and is priced at \$1,500 per pair (floor stands shown are \$185 extra). The M20 is \$2,000 per pair in walnut or black, \$2,200 in rosewood. The M100 is \$5,500 per pair in walnut or black, \$5,800 in rosewood. Imported by Madrigal, Dept. SR, P.O. Box 781, Middletown, CT 06457.

Circle 123 on reader service card



Rotel

The RCD850 Compact Disc player from Rotel uses a three-beam laser pickup. One beam picks up the signal data, and the two secondary beams provide tracking data. Nine tracks can be programmed for playback. Access functions include skip forward, skip back, fast forward, fast reverse, pause, and repeat. The display shows track number, elapsed time, or remaining time. Price: \$499. Rotel Audio of America, Dept. SR, Box 653, Buffalo, NY 14240.

Circle 124 on reader service card



Jensen

The Concert Series CS4000 AM/FM car stereo cassette radio from Jensen features electronic seek tuning, which automatically advances to the next strong station, a two-color digital clock/frequency LED readout, and phase-locked-loop circuitry. Four FM and

four AM stations can be programmed into memory presets. The tape section has autoreverse, locking fast forward, and a tape-direction indicator. The CS4000 also includes balance, fader, and tone controls. Price: \$179.95. Jensen, Dept. SR, 4136 N. United Parkway, Schiller Park, IL 60176.

Circle 125 on reader service card

Thiel

Thiel's CS1 floor-standing speaker has a 7-inch ported polypropylene



woofer and a 1-inch soft-plastic dome tweeter. It is designed to be both time and phase coherent. The drivers and the port are mounted on a sloping baffle so that their combined acoustic output reaches listeners at the same time. A synthesized first-order acoustic crossover (with electronics matched to the mechanical characteristics of the drivers) produces gradual slopes of 6 dB per octave to avoid the phase distortion caused by steep-slope filters.

The sculpted grille board is said to reduce diffraction from cabinet edges. To achieve low distortion and high resolution of low-level signals, the woofer basket is made of cast magnesium and the network capacitors are polypropylene. Frequency response is rated as 52 to 20,000 Hz ± 2 dB. Recommended power input is 40 to 150 watts. Price: \$950 to \$980 per pair in teak; other finishes by special order. Thiel Audio Products, Dept. SR, 1042 Nandino Blvd., Lexington, KY 40511.

Circle 126 on reader service card



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∆UDIO Q. AND A.

by Larry Klein



CD Car Stereo

With the emergence of the Compact Disc, some people will obviously dub CD's onto cassette for use in their car. In this connection, some home CD players incorporate dynamic-compression circuits that are said to produce better car stereo sound. Is this a legitimate bit of technology?

STEVE ALBERTSEN Omaha, NB

Absolutely. The normal back-ground noise in a moving vehicle is loud enough to mask soft passages on classical CD's, and if the player's volume is turned up high enough to make the soft passages audible, subsequent louder passages can be too loud. In some car CD players, playback compression, which makes the soft passages louder and the loud passages softer, can alleviate the problem.

Incidentally, because I know how good well-recorded cassettes can sound played through a high-quality car stereo system, I regard car CD players as an answer to a question nobody asked about a problem nobody had. Although I love CD's for home use, I still prefer cassettes in the car for several reasons: 1) I can store 180 minutes of personally selected dubbed music on two C-90's in just about the same space that one Compact Disc occupies. 2) When my car tapes are ripped off I lose dubbed copies, not original "masters." 3) Unless the car CD player has a switchable compression circuit, the too-loud/toosoft problem discussed above is likely to be annoying, if not a driving hazard. 4) Although CD's can survive far rougher use and storage conditions than LP's, I suspect that in a car they are no more damage resistant than cassettes. And

with dubbed cassettes. I always have the original as a back-up. 5) Much of the material I want to play in my car will never be available on CD-dubs of children's records, spoken-word tapes, taped live broadcasts, and so forth.

Tape Storage

I understand that stray magnetic fields can erase the programs on my tapes. Is it safe to store my audio cassettes and videotapes on a shelf directly beneath my TV monitor?

RUSS LINDEMANN Lake Wales, FL

That would depend on the construction of your TV set. If its internal power transformer radiates a strong a.c. magnetic flux field and happens to be directly over your tape-storage area, it may work as a giant bulk tape eraser. Unless you have some way of measuring the strength of your set's radiated magnetic field and know that there's no problem, I would suggest that you keep your tapes at least a couple of feet away from the bottom of the TV.

Speakers and Dust

I would like to install a couple of speaker systems in my woodworking shop, and I'm concerned about the effect of wood dust on their operation. Do I have anything to fear?

E. CLAUDE COOK Mullens, WV

Fear not. The floating wood dust created by power woodworking tools is fine enough that even if it did get into your speaker systems, I don't see how it could impair their performance. In all modern speaker drivers, the close-tolerance moving elements in the voice-coil gap are sealed away from intruding foreign substances. And although many cones have a sticky damping coating around their edges to which the wood dust will probably adhere, the fine particles won't obstruct movement, add mass, or interfere with the drivers' damping.

Let Me Count the Ways...

I have been arguing with my friends about whether a speaker system with a woofer, a midrange, a tweeter, and a passive radiator should be called a three-way or a four-way system. What is your opinion?

> SALVATORE LUNA Lindenhurst, NY

Keep in mind that, at best, a definition is only a history of how a word has been used, rather than a revelation of an objective, absolute truth. In

ANYTHING ELSE IS JUST UN-PROFESSIONAL



From Live Aid to Lincoln Center, top ten artists to top studio producers, JBL has been the #1 choice in professional loudspeakers for more than 40 years. Now the JBL "T" and "TL" series promise to make the star of stage, screen and studio, the star of car audio, too.

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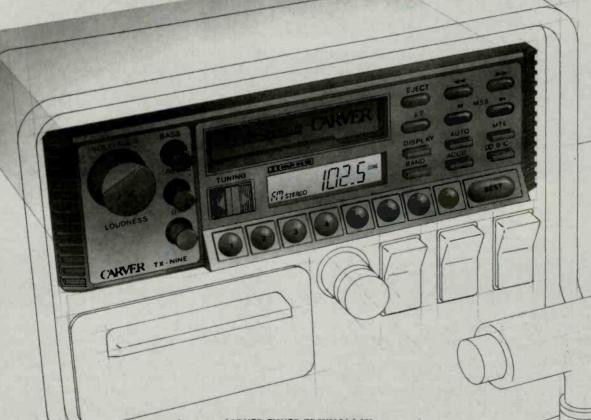
High polymer laminated and mineral filled polypropylene low frequency transducers, in the "T" and "TL" respectively, deliver smooth, uncolored, powerful bass response. They're remarkably resistant to the automobile's acoustically hostile environment. You'll get that smooth JBL response on the bumpiest roads, too. Cast aluminum mountings and diecast frames resist twisting and buckling, even when mounted on uneven surfaces. Cones and voice coils are tightly aligned for consistently accurate musical reproduction and high power handling. The JBL "T" and "TL" series automotive loudspeakers. Once you've heard the professionals, you won't want anything else.

For more information and your nearest dealer call toll free 1-800-633-2252 Ext. 150 or write JBL, 240 Crossways Park West, Woodbury, New York 11797.



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INTRODUCING THE ONLY AM/FM TUNER/ CASSETTE DECKS CAPABLE OF CUTTING MULTIPATH INTERFERENCE UP TO 92.9%! FROM CARVER, NATURALLY.

The new TX-Seven and TX-Nine autoreverse AM/FM tuner/cassette audiophile decks represent yet another example of Carver's ability to solve previously insoluble audio problems and deliver you more musical enjoyment.

CARVER TUNER TECHNOLOGY TAKES TO THE ROAD.

Each deck employs the same Asymmetrical Charge-Coupled FM Detection circuitry as Carver's revolutionary TX-11a home tuner, along with an ingenious automatic computer logic-controlled antenna switching system that further vanquishes multipath distortion.

In point of fact, no other autosound tuner/cassette decks in the world — regardless of price — even begin to approach the TX-Seven and TX-Nine's ability to maintain a hiss-free,

glitch-free, interference free FM listening environment in your car.

Both also possess a multitude of other useful, state-of-the-art features which will recommend them to the most discriminating autosound audiophile.

COLLIDING WITH MULTIPATH DISTORTION.

By its very definition as a moving reception point, a car's FM tuner constantly falls prey to signal reflections from hills, skyscrapers, bridges and even other vehicles. These extra phase modulating signals trick conventional tuners into producing audible sounds we call multipath.

Startling outbursts of clicks, pops, "picket fencing" and other rude and indescrib-

able sounds.

The trouble is, by its very nature, multipath distortion cannot be cured by conventional circuit "improvements." In fact, the better an autosound tuner is, the more faithfully it is deceived into converting phase modulation into ghastly-sounding interruptions in your favorite station.

COMPUTER LOGIC-CONTROLLED DIVERSITY ANTENNA SWITCHING DRIVES AROUND MULTIPATH.

One way to get temporary relief from interference at home is to move the antenna around slightly. That is in effect what the Carver TX-Seven and TX-Nine do with sophisticated circuitry in your car. Instead of physically moving one antenna, they turn your rear defroster into a second separate antenna, 180 degrees out of phase with the first. When multipath occurs, a special smart circuit automatically switches (at the speed of light) to the other antenna, automatically correcting phase and eliminating the multipath before you ever hear it. In serious cases, the circuit actually uses both antenna inputs at once, deriving a signal through sum and difference principles.

ASYMMETRICAL CHARGE-COUPLED FM DETECTION CIRCUITRY BRINGS IT ON HOME.

What little multipath distortion gets through the TX-Seven and TX-Nine's unique smart antenna system runs headlong into the remarkable tuner innovation *High Fidelity Magazine* described as "distinguished (by) its ability to pull clean, noise-free sound out of weak or multipath-ridden signals."

It specially treats the critical, multipathprone left-minus-right (L-R) signal with a Charge-Coupled circuit that detects "dirty mirror image" signals and cancels them before they can reach your ears. Then the Leading Edge Detector circuit processes the final 5% of the L-R and interleaves it with the tuner's receiver matrix.

Alone, without antenna diversity switching, the TX-Seven and TX-Nine's Asymmetrical Charge-Coupled FM Detection Circuit

delivers a net noise and distortion reduction of 92.9%: Together, they set a new standard for clear, clean FM autosound reproduction.

THE MULTIPATH MARATHON: REAL WORLD CONFIRMATION IN THE MISTS OF THE NORTHWEST.

Bob Carver is both a theorist and a practical inventor. Circuits that work on paper get exhaustively tested in the field before release.

So he assigned a hapless engineer to map out the ultimate multipath-ridden route for confirmation of the TX-Seven and TX-Nine's special circuitry. With mountains, hills, huge evergreen trees, skyscrapers, large steel bridges, good robust traffic jams and a few assorted six-story-tall Boeing hangars, it didn't take long to map out a 6-mile course that could regularly deliver at least 287 separate multipath occurrences.

Engaging the Asymmetrical Charge-Coupled FM Detection circuit and automatic antenna switching reduced occurrences to an average of *two* during the same 6-mile course while listening to the same stations!

Although results may vary in your locale, the same 90+% reduction in multipath has been confirmed in other widely diverse portions of the U.S.: The TX-Seven and TX-Nine work, and work well.

OTHER REMARKABLE TUNING FEATURES, TOO.

First, the TX-Seven and TX-Nine also receive Long Wave and Short Wave stations. And of course, both tuner/cassette decks have plenty of random presets...you can tune any fifteen AM, FM, SW or LW stations quickly for instant recall. Plus auto-scan and manual tuning.

But they also have a system that makes setting up all fifteen presets virtually instantaneous. Just press the button marked BEST and the tuner's logic circuitry will automatically select the fifteen cleanest, strongest signals and lock them in on the presets!

And that's *in addition* to your fifteen individual random presets.

As with all Carver products, the TX-Seven and TX-Nine do not sacrifice ease of use for useless, complicated frills. Instead, they answer every possible need without resorting to elf-sized buttons or glitzy flashing light displays.

Their metal-compatible, Dolby* NR, auto-reverse cassette sections rival any in the world. Both the TX-Seven and TX-Nine have separate bass, treble, balance and loudness

and four-way fader controls and a full-function LCD display with night illumination.

All operations are signaled with a gentle "beep" that keeps your eyes on the road, not on the compact, ergonomically-styled deck.

There's even a security code system that renders the TX-Seven or TX-Nine inoperable to anyone but you (and a window sticker to impart this discouraging information to others).

Or, if you prefer, use the quick removal system that slips out your TX-Seven or TX-Nine in seconds for storage in trunk or house.

THE BEGINNING OF THE PERFECT AUTOSOUND LISTENING ENVIRONMENT.

Out of the hundreds of tuner/cassette models currently available, only the TX-Seven and TX-Nine deliver home-stereo quality FM in your car. They achieve it with unique technology. And they are built to outlast your car, no matter what kind of climate you live in.

Coupled with a clean amplifier, such as The Carver M-240 Car Amplifier and state-of-the-art speakers, your ability to transform your car into a concert hall is almost unlimited.

We urge you to audition the TX-Seven and TX-Nine at your Carver dealer soon. They can put you in the driver's seat of a unique, interference-free musical experience.





THE TX-SEVEN AND TX-NINE

TUNER: ♦ Asymmetrical Charge-Coupled FM Stereo Detector ♦ Automatic Computer-Controlled Diversity Antenna Switching ♦ AM, FM, Long Wave and Short Wave Bands • 15 Random Presets ♦ BEST Circuit for Auto-Selection of 15 Strongest Stations (in addition to 15 individual presets) ♦ Preset Frequency Auto-search ♦ Auto-scan Tuning ♦ Manual Tuning ♦ LCD Frequency Read-out. CASSETTE: ♦ Auto-reverse ♦ Programmable Music Search (TX-Nine only) ♦ Computer Logic Activated Controls ♦ Dolby B NR ♦ Dolby C NR (TX-Nine only) ♦ Metal Tape Bias Selector. GENERAL: ♦ Security Code System ♦ Audible Confirmation of All Functions ♦ Separate Bass. Treble, Balance and Loudness Controls ♦ Full-function LCD Read-out w/Night Illumination ♦ CD Line Level Input (TX-Nine only), ♦ Quisick Release Removal System ♦ Year Warranty.

SPECIFICATIONS: ♦ Tuner S/N, ₹ 6dB ♦ 50dB Quieting Sensitivity, ♦ S/N-65dB with Dolby B NR, ₹ 70dB with Dolby C NR ♦ Tape Frequency Response 20 Hz-15 kHz

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CARVER

Corporation, PO Box 1237, Lynnwood, WA 98046

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other words, there are no "shoulds" involved, just agreed-upon usage. In describing the number of "ways" in a speaker system, the usage depends only on the number of electrical divisions of frequency in the system, not the number of drivers. For example, there are several three-way systems with more than three drivers.

Remember that the crossover design can't be relied upon as the distinguishing element. Although most two-way systems use multiple-element crossovers, a few use nothing more than a single capacitor in series with the tweeter. And, in fact, the electrical divisions of frequency need not even depend on a crossover. The piezoelectric tweeters found in many systems do not require an external crossover because of their high impedance at low frequencies. A piezoelectric tweeter or supertweeter does, however, add a "way" to a speak-

Over the years, quite a few speakers have used mechanical crossovers. During the late Fifties and early Sixties, several 8- and 12-inch drivers were designed with a compliance ring installed an inch or so up from the voice coil.

Above some high frequency, the inner section would decouple and act as a tweeter while the entire cone continued to serve as a woofer. The Walsh fullrange driver is another more recent example of a single cone that used a mechanical crossover. And some inexpensive full-range speakers sold for car systems have small "whizzer" cones attached near the main cone's voice coil. In any case, current usage does not allow mechanical crossovers to be equated with electrical crossovers. A speaker with a whizzer cone is not considered a two-way driver because it does not have an electrical crossover.

To answer your question specifically: a passive radiator is known technically as a "vent substitute," which means it functions as a special kind of port in a bass-reflex cabinet design. It does not add another "way" to a speaker system any more than any port would.

Shrill New Speakers

After ten years, I recently decided to upgrade my speaker systems and have been listening to a number of wellregarded models in the \$800 to \$1,200 per pair range at a local dealer. I've come to the conclusion that there must be a new standard for hi-fi sound since they all sound shrill to me-even ones that Julian Hirsch has referred to in test reports as having flat frequency responses. The bright sound causes voices to sound fuzzy. Has the standard for accuracy changed among the speaker manufacturers?

> FRED CHILTON Las Cruces, NM

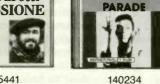
No, the standard for accuracy hasn't changed, nor have speakers become that much hotter in the past ten years. I suspect that what you are hearing is somehow the fault of the dealer's demonstration room, a fault that apparently has not produced any complaints previous to yours. Assuming that the dealer is not deliberately using demo material with boosted highs, it could be that the demo room is inadequately damped, or even that some special high-capacity audiophile speaker cables have caused a capacitance-sensitive amplifier to become marginally unstable and sizzly. My best suggestion is that you try another dealer.



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by Julian Hirsch



Optimistic Specifications: Tuners and Turntables

AST month we discussed some of the specifications applicable to amplifiers and the problems of interpreting advertised performance ratings that may not conform to accepted measurement standards. Of course, amplifiers are not the only components of an audio system. A very similar situation exists with FM tuners and turntables, and it is aggravated by the fact that many of the specs are technical terms whose meanings are not intuitively obvious to most people.

Take FM tuner sensitivity, for example. Laymen often have a vague or incorrect conception of this widely used (and widely misunderstood) term. It means much more than "how many stations the tuner can receive," or even "how weak a signal it can receive," although it has elements of both. FM tuner sensitivity is defined by two totally different ratings, and, unfortunately, the more often emphasized of the two is the least meaningful. Socalled usable sensitivity is the level

of a 100-percent modulated FM signal that produces an audio output containing 3.2 percent (-30 dB) harmonic distortion plus noise. Such a signal is not, by any stretch of the imagination, "usable," and I prefer to think of it as the unusable sensitivity! To the extent that the distortion (if it is less than 10 percent or so) exceeds the noise, the signal may be "listenable"-but it will hardly be suitable for the enjoyment of its musical content.

The alternative spec is 50-dB quieting sensitivity, which is also measured with a 100-percent modulated signal. It is the input level at which, when the modulation is removed, the tuner output (now consisting only of noise) drops by 50 dB. While this still does not represent the sort of noise-free FM reception most of us would wish to listen to, it can provide a reasonably satisfactory audio program.

A much higher input level is needed to produce a noise floor of -65 or -70 dB, which is more comparable to the noise in the program itself. Some of the better tuners require an 85-dBf input to reach their minimum noise level, which can be -85 dB or so in mono and 80 dB in stereo. When you read tuner specs, look for the stereo 50dB quieting sensitivity—the mono spec will be about 20 dB better but is less important for most listeners.

You will also notice that sensitivity is, or should be, expressed in dBf-decibels referred to 1 femtowatt. Usually, as in our test reports, the equivalent value in microvolts

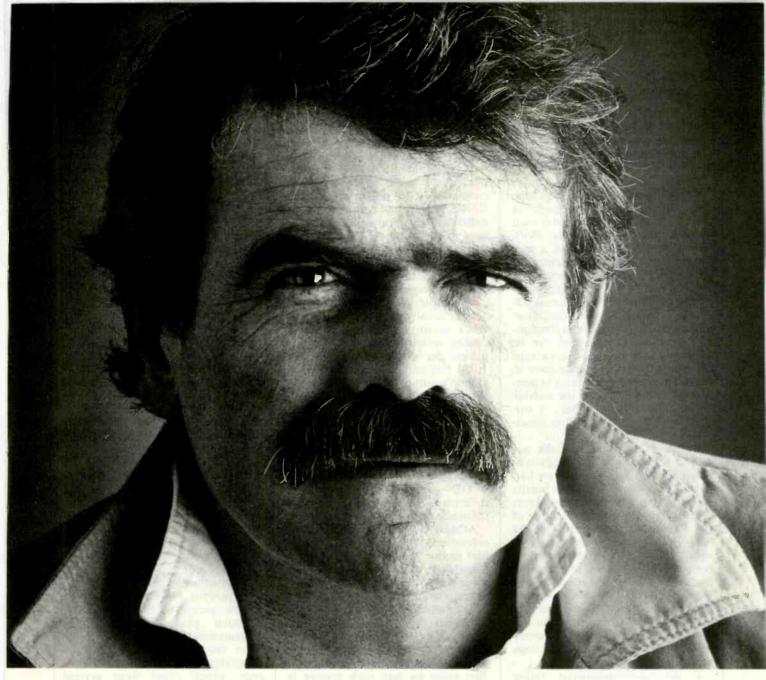
is also stated, but it is secondary to the dBf figure and is provided only to bridge the gap in understanding and acceptance of the current rating system (it has been in effect for eleven years, but these things take time).

It is worth mentioning that lowlevel radio-frequency measurements are not as easy to duplicate as audio measurements. Depending on the specific test instruments used and the individual technique of the operator, it is possible to obtain different results for most tuner measurements. I have found that most (but not all) FM tuners tend to show a poorer-that is, numerically higher-usable sensitivity in the laboratory than is claimed by their manufacturers. In view of the uncertainty just mentioned, I generally do not get too concerned about such discrepancies, particularly since, as I have pointed out, this is really a very unimportant specification. Because of the higher r.f. levels involved, the 50-dB quieting sensitivity is easier to measure accurately and repeatably, and I have no problems with it. The lower the number. the better, but differences of a few decibels between tuners are really not very important unless you are in an extreme fringe-area reception location. Then it is another matter.

In our tests of FM tuners or receivers, we frequently find that the measured usable sensitivity falls short of the manufacturer's ratings because of a frequency error in the tuner's synthesizer circuits. When the current EIA tuner standard was written about twelve years ago, analog tuning was universally employed. The signal generator (simulating a broadcast station) was set to the desired frequency, and the tuner was adjusted for a correct tuning indication on its meter or other readout. Even a slight tuning shift, such as 20 kHz at a frequency of 100 MHz, can have a significant effect on the measured distortion as well as on the usable sensitivity. To allow for such slight errors, the standard permits the tuner frequency to be adjusted for minimum distortion at a low signal level to provide the best (lowest) usable-sensitivity reading. It must be left at that setting, however, for all subsequent measurements. At the higher levels used to measure 50-dB quieting sensitivi-

Tested This Month

Tandberg TPA-3016A Power Amplifier and TCA-3018A Preamp Revox B215 Cassette Deck Jamo CBR 120 Speaker Recoton V624 F.R.E.D. III TV Stereo Decoder Harman Kardon HD 500 Compact Disc Player Hitachi DA-P100 Compact Disc Player



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loudness of the original performance; quiet portions are more realistic too. And you should know that dynamic range provides the *emotional* qualities of music. Which brings us to the purpose of this message.

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P.O. BOX 688 • HOPE, ARKANSAS USA 71801 CIRCLE NO. 2 ON READER SERVICE CARD ty, the limiting action of the tuner's circuits swamps the effect of a slight tuning error.

Today, virtually all FM tuners have synthesizer circuits that tune only to the specific frequencies (usually at 100-kHz intervals) used by FM broadcast stations. With only a couple of exceptions, a user cannot trim the tuner frequency for minimum distortion or noise. Its value is normally determined solely by the frequency of an internal reference quartz-crystal oscillator. Since neither the broadcast frequency nor the tuner frequency can be adjusted by the user, he must accept the effects of any frequency error in the tuner. Although the error is rarely large enough to affect the audible performance of the tuner, it can have a distinct effect on its measured performance.

Before Hirsch-Houck Labs acquired a Panasonic frequency-synthesis FM signal generator, we had to tune our generator for best results when testing a frequency-synthesis tuner. Now, since the frequency of the Panasonic instrument can be read directly, within an error of about 1 kHz at 100 MHz, we set both it and the tuner to the same frequency and let the results speak for themselves. As a check, however, we also adjust the generator frequency to see if the distortion decreases. If it does, the frequency error is noted but our initial settings are retained.

If the usable-sensitivity rating were important, minor errors in frequency—which exist in the vast majority of tuners and receivers we test-might indeed be serious, but in the real world it matters little. The reader should be aware that if, say, we measure a 17-dBf usable sensitivity on a tuner rated at 11 dBf, it does not necessarily mean that the manufacturer is exaggerating or that our measurements are wrong. Most likely, the tuner's reference oscillator frequency has not been adjusted with sufficient care, or perhaps the crystal's stability is not quite what it should be!

Another component whose measured performance rarely agrees with published specifications is the turntable. Turntable measurements are complicated by the fact that both a record and a pickup (tonearm and cartridge) are necessary for the measurements, as well as an equalized preamplifier to process the output of the cartridge before it is measured. The properties of the record, pickup, and preamplifier are difficult, if not impossible, to separate from those of the turntable itself, and although there are some standards governing turntable measurements, there are none for the associated components.

A rumble measurement, for example, involves calibrating the system's sensitivity for a specific recorded velocity (such as 3.54 centimeters per second, or 10 cm/s at 1,000 Hz) and then measuring the system's output while playing a "silent groove" recording. The playback frequency response is weighted to reduce the effect of noise at middle or high frequencies. Unfortunately, the reference levels and weighting curves called for by different standards—EIA, ARLL, JIS, or DIN-are not the same, and the differences can have a considerable influence on the results.

At least as important as these considerations is the matter of the "silent groove" test disc itself. To my knowledge, there is no such thing as a truly silent disc. I certainly have never seen or heard of one. A number of rumble-test discs have bands identified as "silent," but a moment's listening to them at a moderate level will show that this is a euphemism for "unmodulated." The noise on any such groove is almost always audible to the ear. and certainly evident to the test

We regularly use a lacquer disc that has been cut with two bands of unmodulated grooves, near the outside and inside of the disc. In general, one of these bands (not always the same one, though) will produce a lower rumble reading than the other. They are quieter than any of the similar bands on commercial test records but are still a long way from being "silent" in the sense that would apply to a CD. The problem of groove rumble is exacerbated because all tonearms and cartridges resonate at a low frequency (5 to 15 Hz, as a rule), and if this resonance is not well damped, the groove rumble near that frequency will be accentuated. Of the many turntables

we have tested over the years, I doubt that more than a handful have produced rumble readings close to those on their spec sheets. Fortunately, it is easy to tell for yourself if rumble is a problem (which it rarely is, these days). If you can't hear anything wrong, don't worry about it!

Flutter and its close relative, wow, are measured with a disc that has been recorded with a steady 3,000or 3,150-Hz tone. The playback output is analyzed by a flutter meter, which is a form of FM receiver tuned to the recorded frequency and displaying the percentage of frequency modulation on a meter scale. In this case, the problem is not with the measurement setup or instrumentation, but again with the test record. Even if the master recording was made perfectly, almost every vinyl pressing is both eccentric and warped to some degree. The flaw may not be visible, or audible on program material, but even a microscopic physical deviation from ideal flatness or a perfectly concentric spindle hole will introduce some wow or flutter in the playback from a perfect turntable.

I would not expect any turntable to yield a flutter reading of less than 0.06 percent JIS-weighted rms or ±0.08 percent CCIR- or DINweighted peak. Occasionally a measurement will fall slightly below these readings, but they are the approximate limits of my test records, which come from several sources (including standard DIN releases). Nevertheless, you will sometimes see flutter (usually on a direct-drive turntable) specified as low as 0.02 percent or less. If you read the footnote to the rating, you will usually find that it was based on a measurement of the error signal in the servocontrol loop of the turntable and did not even involve a record or pickup. Such a measurement is technically correct but has little to do with a turntable's performance in playing records.

Speaking of unrealistic specs, tuners and turntables are not the only offenders. Frequency-response and distortion measurements for loudspeakers are, at times, also subject to some fairly dubious measurement techniques. That, however, is a topic for another column,



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TANDBERG TPA-3016A POWER AMPLIFIER AND TCA-3018A PREAMPLIFIER

Julian Hirsch, Hirsch-Houck Laboratories

ANDBERG'S new power amplifier, the 3016A, is a noholds-barred design aimed at the demanding (and affluent) audiophile. Its unconventional circuitry and choice of internal components strongly suggest a perfectionist attitude on the part of its designers.

The 3016A is a large, heavy, and powerful amplifier. It is rated to deliver 220 watts per channel into 8-ohm loads from 20 to 20,000 Hz with no more than 0.05 percent total harmonic or intermodulation distortion. It is also rated for 400 watts per channel into 4 ohms. Its rated A-weighted noise level is -94 dB referred to 1 watt (into 8 ohms), and its rated frequency response is +0, -0.1 dB from 20 to 20,000 Hz and down only 0.2 dB at 1.5 MHz.

The special qualities of the Tandberg 3016A are not visible externally. It consists of two entirely separate mono amplifiers, with separate power supplies and transformers, that share only the line cord, power switch, and cooling fan. Each output stage employs eight MOSFET transistors, without any currentprotection or limiting circuits. According to Tandberg, the dualmono amplifier can deliver up to 100 amperes into a 0.5-ohm load during a 3.5-millisecond burst, and it carries a pulse-power rating of 2,500 watts into 0.5 ohm. The massive current capacity of the amplifier is supported by a total of 120,000 microfarads of power-supply filter capacitance.

The output transistors mounted on heavy, finned heat

sinks along the sides of the amplifier. Sensors on the heat sinks gradually turn on the electronically controlled fan as the temperature begins to exceed 70° C (it does not come on at all in normal operation). The capacitors in the signal path use polypropylene as a dielectric material, which is thought by many to give better sound than other dielectric capacitor materials. Selected metal-film resistors are used exclusively, as are discrete transistors there are no integrated circuits. Other construction features not often found in home amplifiers include heavy circuit boards with copper ground-plane layers on both sides, to minimize common ground paths and the resulting noise and distortion, and gold-plated input and output sockets.

Probably the most unusual circuit feature of the 3016A is its "feedforward" design. Most amplifiers use negative feedback to reduce their inherent distortion and noise and to lower their output impedance for better speaker damping. In recent years there has been much controversy concerning the alleged undesirable effects of negative feedback,

LABORATORY MEASUREMENTS

☐ TPA-3016A Power Amplifier

1,000-Hz continuous output power at clipping: 300 watts into 8 ohms; 485 watts into 4 ohms; 665 watts into 2 ohms

Clipping headroom (relative to rated output): 1.35 dB (8 ohms); 0.84 dB (4 ohms)

Dynamic power output: 324 watts into 8 ohms; 578 watts into 4 ohms; 990 watts into 2 ohms; 1.250 watts into 1 ohm

Dynamic headroom: 1.68 dB (8 ohms); 1.59 dB (4 ohms)

Harmonic distortion (THD + noise at 1,000 Hz into 8 ohms): 1 watt, 0.0035%; 220 watts, 0.0195%

Slew factor: 13 Sensitivity (for a 1-watt output):100 millivolts

A-weighted noise (referred to a 1-watt output): -93 dB

☐ TCA-3018A Control Amplifier

Frequency response (through high-level input, EIA-standard load): 10 Hz to 100 kHz ±0 dB;

-0.5 dB at 5 Hz; -3 dB at 450 kHz

Voltage output at clipping: 12.5 to 13 volts from 20 to 20,000 Hz

Harmonic distortion (THD + noise at 1,000 Hz into 8 ohms): 0.027% at 0.1 volt; 0.0062% at 1 volt; 0.016% at 3 volts; 0.0245% at 5 volts

Sensitivity (for a 0.5-volt output): high-level input, 78 mV; MM phono, 1.1 mV; MC phono, 0.066 mV

A-weighted noise (referred to a 0.5-volt output): high-level, -90 dB; MM phono, -80 dB; MC phono, -76.5 dB

Input-overload level: MM phono, 210 to 277 mV, depending on frequency; high-level, unmeasurable (see text)

Phono-input impedance (MM): 47,000 ohms and 140 picofarads RIAA phono-equalization error:

± 0.15 dB from 20 to 20,000 Hz

Headphone output at clipping
(1,000 Hz): 17.5 volts into an
open circuit; 9.4 volts into 200
ohms; 0.73 volt into 8 ohms

especially in the large amounts commonly used in high-fidelity amplifiers. Negative feedback has been claimed to produce various forms of transient intermodulation distortion, although the audible significance of such distortion in real-world home music reproduction is open to question. In any event, many amplifier designers now use much less negative feedback and resort to other means of reducing conventional distortions to acceptable levels.

One such approach is Tandberg's "feedforward" design. Instead of returning a portion of the output signal to the input stage, comparing it with the input signal, and amplifying the difference between them (the distortion) to cancel out most of the output distortion—the negativefeedback approach—it is possible to use a low-power, highly linear (Class A) amplifier to drive the speaker load at low power levels, gradually augmenting its output as needed for higher signal levels with the higher current available from Class B output transistors. Such a feedforward amplifier is inherently free of crossover distortion (a lowlevel phenomenon common to Class B amplifiers), so that there is virtually no need for critical bias stabilization and matching of the output transistors. The linearity and gain of the amplifier are essentially determined by a bridge of passive components, effectively removing output-transistor nonlinearity from its transfer function.

The Tandberg 3016A uses no overall negative feedback in its signal path. The amplifier is directcoupled throughout except for a blocking capacitor at the input (which can be bypassed if your preamplifier has no d.c. component in its output), and its d.c. stability is maintained by a thermal feedback system that monitors the transistor temperatures and corrects the operating conditions of the affected stages to maintain a zero average d.c. output voltage. In normal feedback amplifiers, this is sometimes maintained by a d.c. feedback loop but Tandberg's engineers apparently felt that the longer time constant of the thermal loop accomplishes the desired result with no possibility of audible side effects. Although this circuit can be viewed as a form of negative feedback (at low infrasonic frequencies), it is not in the signal path and thus does not violate Tandberg's principle of avoiding

overall negative feedback in the 3016A.

The only front-panel features of the Tandberg 3016A are a large, rocker-type power switch with a small red LED pilot light and four LED's on the upper section of the panel that light to show peak-clipping and the operation of the thermal protection system (marked TERM OVERLOAD), presumably the activation of the rear-mounted fan. Separate warning lights are provided for each channel.

The Tandberg 3018A control amplifier (preamplifier) is a companion to the 3016A power amplifier, which it matches in styling and all-black finish. The 3018A shares many design features with its companion, including the exclusive use of polypropylene capacitors, metal-film resistors, and discrete active devices (transistors instead of integrated circuits).

Like the power amplifier, the control amplifier uses no negative feedback, depending on close component tolerances and a special circuit topology to maintain the intended performance. The same design approach is carried over into its RIAA phono equalization, which is accomplished by means of passive components used with separate "blocks" of gain instead of the common practice of building the equalization network into a negative-feedback loop of the phono preamplifier. A toroidal power transformer is used because of its very low external magnetic field.

The 3018A is a "minimalist" control amplifier, with no tone controls or similar features. Its basic frontpanel operating controls consist of a single large volume knob, with a concentric balance lever, and two small knob-operated switches that independently select the program source to be heard and the source being supplied to the two sets of tape-recording output jacks on the rear apron. Also on the front panel are a pushbutton power switch with LED indicator, a headphone jack with a small volume knob (the headphone output is completely independent of the main volume-control setting), and a SUBSONIC FILTER button with indicator light. Although the fact is not specifically mentioned in the instruction manu-

331488-391482. Bach Brandenburg Concertos, 1 to 6 (complete) — Kapp. cond. (Counts as 2— Digital—CBS Masterworks) 343251, Bach: Goldberg Variations—Glenn Gould (Digital—CBS Masterworks)

330647. Bach: Unaccom-panied Cello Sultes 1, 2 -performed by Yo-Yo Ma (Digital-CBS Masterworks)

336578-396572, Bach: Flute Sonatas—Rampal, flute: Pinnock, harpsi-chord, etc. (Counts as 2— Digital—CBS Masterworks)

338178. A Bach Celebration. Christopher Parken-ing plays music from Bach cantatas (Digital—Angel)

326983. Bach: Organ Masterpieces—Toccata & Fugue in D MInor, etc. A. Newman (Sine Qua Non)

342329. Bartok: Miraculous Mandarin (complete ballet); Music For Strings, Percus-sion & Celesta—Dorati, Detroit Sym. (Digital—London)

338004-398008. Beethoven Plano Sonatas — Moonlight, Appassionata, Tempest, 3 more. A. Brendel (Counts as 2—Vox Cum Laude)

335075. Beethoven: Overtures—Coriolan, etc. Tennstedt, London etc. Tennsteat, Londo Phil. (Digital—Angel)

321570. Beethoven: Symphony No. 5; Schubert: Symph. No. 8 (Unflnished) —Maazel, Vienna Philhar. (Digital—CBS Masterworks)

252874. Beethoven: Symphony No. 9 (Choral) —Ormandy and the Phila-delphia Orch. (Columbia)

341982-391987. Beethoven: Sonatas for Plano & Violin. Vol. I—Eugene Istomin & Isaac Stern (Counts as 2— Digital—CBS Masterworks)

335547. Berlioz: Symphonie Fantastique— Barenboim, Berlin Phil (Digital—CBS Masterworks) 263293. Bolling: Suite For Flute and Jazz Plano—

Rampal, Bolling (Columbia) 343145. Bolling: Original Ragtime—the composer at piano (CBS)

334243. Brahms: Piano Concerto No. 1—Welssen-berg, Mutl, Philadelphia Orch. (Digital—Angel)

332668, Brahms: Symphony No. 1—Tennstedt cond. (Digital—Angel) 341107. Brahms: Double Concerto—Menuhin, violin; Torteller, cello; Berglund, cond. (Digital—Angel)

339374. Chopin: Plano Concerto No. 2: Schumann: Plano Concerto-Andras Schiff; Doratl, Amsterdam Concertge-bouw (Digital—London)

343152-393157. Chopin: Nocturnes—Abbey Simon at the piano (Counts as 2 —Vox Cum Laude)

335679, Debussy: La Mer; Nocturnes-Andre Previn cond. London Symphony (Digital—Angel)

340182. Glass, Philip: Mishima—music for the film (Digital—Nonesuch)

323543. Handel: Royal Fireworks Music; Oboe Concertos—Munchinger cond. (Digital-London)

341214. Haydn: Symphony No. 100 (Millitary), No. 104 (London)—Hogwood, cond. (Digital—L'Oiseau-Lyre) 321190. Liszt: Hungarlan Rhapsodies 1 & 4; more

Boskovsky cand. (Angel) 334508. Mahler: Symphony No. 1 (Titan)-Muti cond. Philadelphia Orch. (Digital—Angel)

338723. Mozart: Requiem —Hogwood cond. soloists, chorus, Acad. of Ancient Music (*Digital-L'Oi*seau-Lyre)

332114. Mussorgsky: Pictures At An Exhibition; Borodin: Polovisian Dances —Ashkenazy, Philharmonia Orch. (Digital—London)

338228. Offenbach: Galte Parisienne; Gounod:
"Faust" Ballet Music —
Dutolt, Orch. symphonique
Montreal (Digital—London)

339663. Pachelbel: Kanon
—also Bach, Albinonl, etc.
Munchinger, Stuttgart
Chamber (Digital—London)

341735. Rimsky-Korsakov: Scheherazade—Charles Dutoit, Montreal Symphony Orch. (Digital-London)

341677, Schubert: Symphonies 2 & 8 (Unfinished) Daniel Barenboim and the Berlin Philharmonic (Digital—CBS Masterworks)

339358. Schubert: Trout Quintet—Andras Schiff, plana: Alois Posch; Hagen Quartet (Digital—London)

341610. Strauss, Richard: Der Rosenkavaller Sulte Die Frau Ohne Schatten Dorati, Detroit Symphony Orch. (Digital-London)

343715. Vivaldi: Four Seasons—Maazel, members Orch. National de France (Digital—CBS Masterworks)

323147. Wagner: Orchestral Music from "The Ring"— Sir Georg Soltl, Chicago Sym. (*Digital*—London)

338814. Webber: Requiem -with Domlingo, Brightman, Winchester Cathedral Choir, Maazel, English Chamber

Orch. (Digital—Angel) 334839. Maria Callas-Rossini & Donizetti Arlas. From William Tell; L'Elisir D'Amore; etc. (Angel)

334276. Canadian Brass & Berlin Phil. Brass Brass in Berlin. Bach,
Pachelbel, Gabriell, etc.
(Digital—CBS Masterworks)

341602. Jose Carreras— French Opera Arlas. Arias from Le Cid, Faust, Carmen. etc. (Digital—Angel)

337279. Placido Domingo —Save Your Nights For Me. Love Came For Me Marla: etc. (CBS)

246843. Vladimir Horowitz

-New Recordings Of
Chopin. (Columbia)

339408. Hubert Laws/Chick Corea/Quincy Jones. Blan-chard: New Earth Sonata; etc. (CBS Masterworks)

343624. Wynton Marsalís Plays Trumpet Concertos. Haydn, Hummel, L. Mozart (Digital—CBS Masterworks)

331959-391953. Mormon Tabernacie Choir—Great Choruses of Bach and Handel. (Counts as 2 CBS Masterworks)

327551. Luciano Pavarotti -Mamma. Popular Italian songs (Digital-London)

329524. Peaches & Cream-Dances & Marches by John Philip Sousa—E. Kunzel, Cincinnati Pops Orchestra (Digital—Vox Cum Laude)

Of Spring—Dutolt cond. Orchestre symphonique de Montreal (Digital—London) 339242. Puccini Heroines. Eva Marton, Renata Scotto, Katia Ricciarelli, others (CBS Masterworks) 336461, Tchaikovsky: Violin Concerto; Serenade

333112. Andreas Vollen-weider—White Winds. —Pinchas Zukerman; Zubln Mehta, Israel Philharmonic (Digital—CBS Masterworks) The Inventive harpist's latest (Digital—CBS)

340562. Waverly Consort

Renalssance Favorites.

Morley, Gibbons, Byrd, etc.

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334763. John Williams— Bach, Handel, Marcello Concertos arr. for guitar (Digital—CBS Masterworks)

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phony No. 9 (New World)
—Solfi, Chicago Symph,
Orch. (Digital—London) 333526-393520, Dvorak Slavonic Dances; etc. Dorati, Royal Phil. (Counts as 2—Digital—London) 339226. Gershwin: Rhapsody in Blue; Second Rhapsody; etc.—M. Tilson Thomas, Los Angeles Phil. (Digital—CBS Masterworks) 331314. Gershwin: An American in Paris—plus Grainger's Fantasy on Porgy & Bess—Labeque Sisters (Digital—Angel)

Symphony No. 2 (Resur-rection)—Lorin Maazel, Vienna Phll. (Counts as 2– Digital—CBS Masterworks) 318824. Mendelssohn: Symphony No. 4 (Italian); Schumann: Symphony No. 4—Tennstedt, Berlin Phil. (Digital—Angel) 339366. Mozart: Fine Kleine Nachtmusik; more. Hogwood, Acad. Ancient Music (*Digital-L'Oiseau-Lyre*) 328740. Mozart: Piano Concerto 24; Rondos— Perahla, Eng. Chamber Or. (Digital—CBS Masterworks)

341297. Prokoflev: Symphony No. 1 (Classical); Love For Three Oranges Sutte—Lorin Maazel, cond. (Digital—CBS Masterworks) 334565. Rachmaninoff: Symphony No. 2 (complete version)—Simon Rattle and Los Angeles Philharmonic (Digital—Angel)

318451. Ravel: Bolero; Pavane: Daphnis Et Chloe (Suite No. 2)—Andre Previn, London Symphony (Angel) 340190. Reich: The Desert Music —M. Tilson Thomas, members Brooklyn Philhar-monic (Digital—Nonesuch)

334680. Tchaikovsky: Balief Sultes—Swan Lake, Sleeping Beauty—Muti, Phila. Orch. (Digital—Angel) 342154. Tchalkovsky: Romeo & Juliet; Francesca da Rimini—R. Chailly and the Cleveland Orchestra (Digital—London)

338244, Stravinsky: Rite

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The program inputs are identified as AUX, DD (for digital disc), TAPE 1, TAPE 2, TUNER, and PHONO. As in the 3016A, the signal input and output jacks in the rear of the unit are gold-plated. There are separate inputs for moving-magnet (MM) and moving coil (MC) cartridges, selected by a toggle switch between them. A second three-position toggle switch near the MM input selects the capacitance, shunting the standard 47,000-ohm input resistance in parallel with 150, 330, or the normal "0" picofarads to suit the requirements of the cartridge. In addition, the d.c. blocking capacitor at the output can be short-circuited if desired when the 3018A is used with a power amplifier, such as the Tandberg 3016A, whose input already has a series capacitor.

The technical specifications of the Tandberg 3018A are extremely detailed and follow the requirements of the IHF A-202 standard (now incorporated in EIA RS-490). The rated frequency response is unusually flat: +0, -0.1 dB from 1.6 to 250,000 Hz through the high-level inputs and ± 0.2 dB from 20 to 20,000 Hz through the phono inputs. The exceptionally low noise and distortion ratings are equally noteworthy, as is the input-overload rating of greater than 20 volts for high-level inputs and 290 millivolts for the MM phono input.

The Tandberg 3016A power amplifier measures 17½ inches wide, 8¾ inches high, and 13¾ inches deep, and it weighs 62 pounds. The 3018A control amplifier's dimensions are 17½ x 3½ x 13¾ inches, and it weighs 12½ pounds. Optional black Lucite or rosewood end pieces, or rack-mounting adaptors, are available for both units. Prices: TPA-3016A, \$3,295; TCA-3018A, \$1,695. Tandberg, Dept. SR, Labriola Court, Armonk, NY 10504.

Lab Tests

The Tandberg 3016A is a hot amplifier in several ways. Not only did the standard one-hour preconditioning make its top surface uncomfortable to the touch, but we also found that it became warmer than most amplifiers we have used even when idling or during normal sys-

tem operation. On the other hand, at no time were we able to make the cooling fan come on, indicating that the critical temperatures within the unit never reached 70° C. The practical implications of this are all positive: unlike most fan-cooled amplifiers, the 3016A will not intrude on your listening pleasure with an annoyingly loud fan.

In its performance, the 3016A was one of the most nearly ideal amplifiers we have seen. Specifically, its distortion level, though always negligible, decreased as the power was reduced. Many amplifers have *more* distortion at a few watts output than at full power due to crossover effects, which are absent from the

The Tandberg 3016A and 3018A were as impressive to listen to as to measure. We have never heard better sound in our own listening room, and we were also impressed with the headphone output level.

3016A because of its feedforward design.

With loads from 2 to 8 ohms, the 3016A's 1,000-Hz distortion was typically 0.002 to 0.005 percent under 100 watts output, reaching about 0.02 percent at rated power. At 22 watts, the distortion was less than 0.002 percent from 20 to 500 Hz, rising smoothly to 0.014 percent at 20,000 Hz. At the rated 220 watts, it was a constant 0.018 percent from 20 to 7,000 Hz and reached 0.027 percent at 20,000 Hz. The slew factor was 13.

An input of 0.1 volt produced a reference 1-watt output, and the Aweighted noise was 93 dB below that level. The amplifier's output clipped at 300 watts per channel into 8 ohms, 485 watts into 4 ohms, and 665 watts into 2 ohms. Because each channel has its own power supply, these readings apply equally to single-channel and dual-channel operation. The clipping headroom for 8- and 4-ohm operation was 1.35 and 0.84 dB, respectively. Our dynamic power measurements showed the clipping level to be 324

watts into 8 ohms, 578 watts into 4 ohms, and an impressive 990 watts into 2 ohms. The respective 8- and 4-ohm dynamic headroom measurements were 1.68 and 1.59 dB. We were unable to verify the manufacturer's claim of a 90- to 100-ampere short-term current output into a 0.5-ohm load. The lowest load impedance we could provide for this test was 1 ohm, into which the amplifier delivered about 35 amperes rms (1,250 watts) during short tone bursts.

At no time in our use or testing of the amplifier were we able to light up the clipping indicators—even hard clipping into 2 ohms did not turn them on. Tandberg informs us that at the time our test unit (a very early production sample) was manufactured, there had not been a final decision made at the factory concerning the proper setting of the clipping-level adjustment. In current production models, this will be set so that a small amount of waveform clipping will activate the indicators.

In testing the 3018A preamplifier, our measurements were made with it driving an EIA-standard load of 10,000 ohms in parallel with a 1,000-picofarad capacitance. The output-voltage waveform clipped at 12.5 to 13 volts from 20 to 20,000 response The frequency through a high-level input was perfectly flat from 10 to 100,000 Hz, falling to -0.5 dB at 5 Hz and -3dB at 450 kHz. (Removing the EIA load extended the high-frequency response to 2.82 MHz at the -3-dB point.) The input sensitivity, for a 0.5-volt output, was 78 millivolts (mV) through a high-level input, 1.1 mV through the MM phono input, and 0.066 mV through the MC phono input. The respective Aweighted noise levels, referred to 0.5 volt, measured -90, -80, and 76.5 dB.

The MM phono input overloaded at inputs between 210 and 277 mV, depending on frequency. We were unable to measure the high-level input-overload limit (rated at 20 volts), but up to the 10-volt maximum output of our signal source there were no signs of clipping in the output waveform. The MM phono-input impedance was 47,000 ohms in parallel with 140 pF, and



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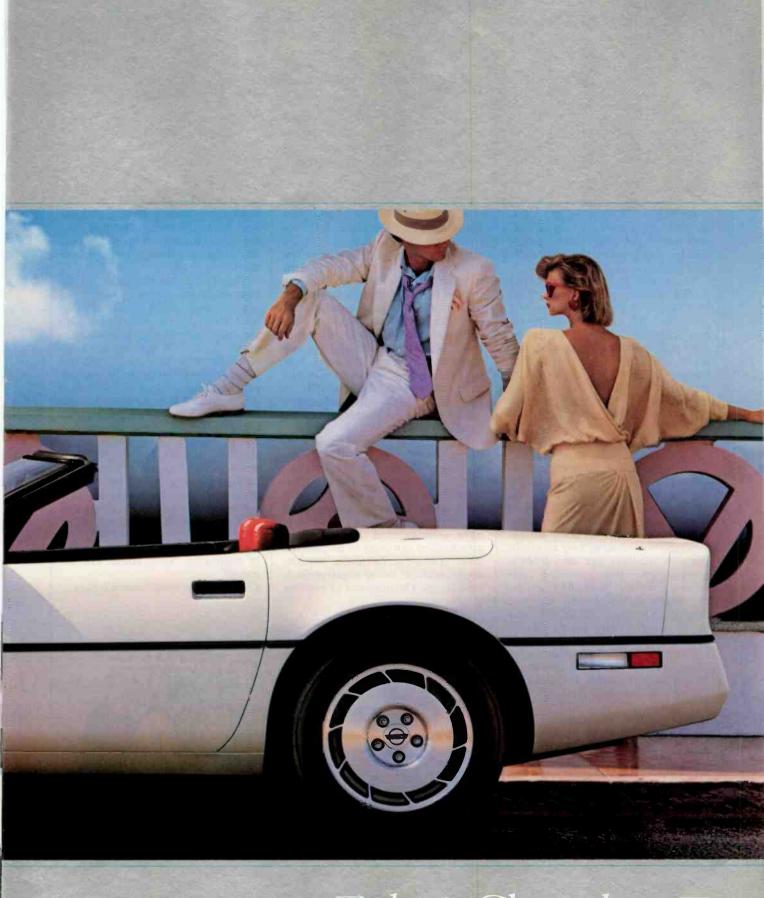


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the capacitance added by the rearapron switch was approximately as rated. The output distortion (THD + N) was slightly larger at 0.1 volt output than at higher levels, reflecting the greater contribution to the measurement of the small amount of noise present in the amplifier output. At 1,000 Hz, the distortion was 0.027 percent at 0.1 volt, 0.0062 percent at 1 volt, 0.016 percent at 3 volts, and 0.0245 percent at 5 volts. It consisted almost entirely of second harmonics and random noise, and the levels were not significantly different at 20 and 20,000 Hz.

The 1,000-Hz headphone output at the clipping point varied from 17.5 volts into an open circuit to 9.4 volts into 200 ohms and 0.73 volt into 8 ohms. The maximum power (440 milliwatts) was developed with a 200-ohm load, which is typical of many of the better stereo headphones. The 3018A's headphone volume should be more than sufficient with headphones of any impedance.

The RIAA phono equalization was extraordinarily accurate, and we had to plot it on a ten-timesexpanded scale to measure its deviation from the ideal characteristic. It was flat within 0.15 dB overall from 20 to 20,000 Hz, a reading comparable to the accuracy of our measurement system and certainly the best we have yet seen from a preamplifier. We extended our measurement of the phono response to establish its limits: it had dropped a mere 0.2 dB at 5 Hz and began to roll off slightly above 30,000 Hz. The SUBSONIC FILTER reduced the response by less than 1 dB at 50 Hz, 2.5 at 20 Hz, and about 12 dB at 5 Hz, with a 12-dB-peroctave slope below 5 Hz.

Comments

The combination of the Tandberg 3016A and 3018A was as impressive to listen to as it was to measure. We certainly could not fault the sound of the two units with speakers and sources of comparable quality. We have never heard better sound in our own listening room. We were also impressed with the output level from the 3018A's headphone jack, which would have been consistent with driving phones from a power amplifier (this is not too surprising

in view of the healthy fraction of a watt delivered by the separate headphone amplifier).

Our only "lukewarm" reaction to these superb components concerned installation requirements. They are so closely matched in appearance and size that stacking them seems to be a logical procedure, but there is a catch. Unlike many preamplifiers that run stone cold, the 3018A gets hotter than many power amplifiers or integrated amplifiers. And the 3016A also runs surprisingly warm to the touch. Neither poses any problem in itself, but when we stacked the two (in the open, though against the manufacturer's recommendations). they became distinctly hot in a short period of normal (low-level) operation. While the temperature rise might not cause any problems, heat is the enemy of all electronic circuits, so it would be advisable to find some well-ventilated place where the power amplifier can be located by itself.

Tandberg has taken an unconventional approach to amplifier design in these two products, which are clearly aimed at the high-end enthusiast. By any objective criteria, both these components are outstanding performers. Tandberg's engineers have demonstrated decisively that an amplifier can meet or surpass the most critical performance requirements without using negative-feedback loops. The question of whether

the 3016A and 3018A sound "better" than other amplifiers is one that each listener must answer for

Although the 3016A's ratings are not significantly different from those of some other very fine amplifiers, its actual measured performance far exceeded Tandberg's claims. It was totally silent, both mechanically (acoustically) and electrically, and it is hard to imagine any home listening situation that would even come close to probing its limits or causing its protective fan to come on.

The 3016A has the ability to deliver many hundreds of watts into almost any conceivable speaker load. Even the Apogee speaker, with its 1-ohm impedance, is unlikely to make the 3016A breathe hard, let alone collapse as many other fine amplifiers do. Along with this output capability comes a noise level 93 dB below 1 watt, or 116 dB below rated power. These numbers define a dynamic range exceeding that of a CD by a comfortable margin. From this we can infer that the 3016A is unlikely to be found wanting when handling any program source and driving any speaker in any home.

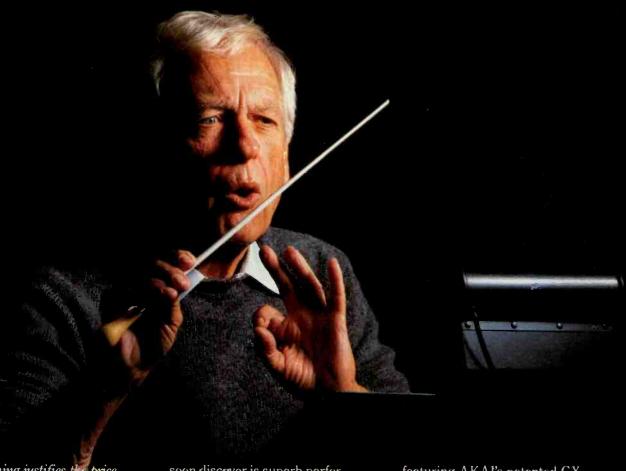
We find it reassuring to know that products like the Tandberg TPA-3016A and TCA-3018A exist, and our experience with them was totally enjoyable. Who could ask for more?

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REVOX B215 CASSETTE DECK

Craig Stark, Hirsch-Houck Laboratories

HE same emphasis on massively solid construction, meticulous engineering, and fine craftsmanship that has made Studer the pre-eminent manufacturer of professional tape decks is evident in the company's Revox B215 consumer cassette deck. A three-head, four-motor deck with Dolby B and Dolby C noise reduction, Dolby HX Pro headroom extension, and microprocessor-controlled tape transport and electronics, the B215 is designed to meet the most critical audiophile's sonic demands. At the same time, the deck does not require the user to be a technophile in order to realize its audio potential.

The tape transport of the B215 is built on a heavy, die-cast aluminum chassis. To minimize wow-and-flutter, two quartz-crystal-controlled, direct-drive Hall-effect d.c. motors are used for the closed-loop, dual-capstan drive. A second pair of direct-drive motors is used for reel spooling. After the user presses a button to select the tape length, a

microprocessor coupled to an optical tachometer measures the relative rate of rotation of the reel motors and calculates the elapsed time on a side, which is continuously updated on a four-digit, liquid-crystal display. During winding, an optical sensor is used to detect the difference between the tape and the translucent leader at its ends, and electrical rather than mechanical braking stops rotation so that the tape is never yanked at the hub connection when the end of the side is reached.

The record and playback heads are separate units joined in a common casing, which allows immediate comparisons between the source and the recording. The three-head design also enabled Revox to optimize the respective head gaps, using a narrow-gap head for playback (ensuring against high-frequency losses) and a wide-gap head for recording (maximizing signal-tonoise ratio).

The B215 does not have a conventional tape-head well and door.

Instead, cassettes are pressed into place against a slightly recessed plate on the deck's front. This allows full visibility for the label and tape pack as well as easy access to the heads and capstan rollers for routine cleaning. A detachable dust cover is provided for periods when the deck will not be in use.

While the deck automatically switches its bias and equalization settings to match the tape type (ferric, CrO₂, metal), the user can manually override the settings. In addition to providing selectable Dolby B or Dolby C noise reduction, the

The Revox B215 is designed to meet the most critical audiophile's demands, but at the same time, it does not require the user to be a technophile in order to realize its audio potential.

Revox B215 employs the Dolby HX Pro headroom-extension system whenever the deck is in the recording mode.

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340323. Sade-Promise. # Smash. (Portrait) 263293. Bolling: Suite For Flute & Jazz Piano—Rampol, Bolling (Columbia)

339226. Gershwin: Rhapsody In Blue; Second Rhapsody; etc M. Tilson Thomos, Los Angeles Phil. (Digital-CBS Masterworks

338616. Miomi Vice-Music From The Television Series. G. Frey # You Belong To The City, many more. (MCA) 341297. Prakofiev:

Symphony No. 1 lassical); Love For Three Oranges Suite—Lorin Moazel cond. (Digital—CBS Masterworks)

323261. Lionel Richie-Can't Slow Down. All Night Long; Stuck On You; Hello; etc. (Motown) 335547. Berlioz:

Symphonie Fantastique. Barenboim, Berlin Phil. (Digital-CBS Masterworks) 331264. Bryan Adams— Reckless. #1 hit: Heaven; Run To You; etc. [A&M]

339903. The Cars-Greatest Hits. Tonight She Comes; more. (Elektra) 341263. Enoch Light & The Light Brigade—Big Bands Of The Thirtles. Begin The Beguine; more. (Project 3)

322008. Linda Ronstadt & The Nelson Riddle - What's New. (Asylum)

341073. Steely Dan— A Decade of Steely **Da**n. Reeling In The Years; He Nineteen; more. (MCA) 320499. The Police-

Synchronicity, Winner of 3 Grammy Awardsl (A&M) 343160. Beethaven: Symphony No. 9 (Choral). Bruno Walter, Columbia Sym. (CBS

Masterworks 337279. Plocido Domingo-Save Your Nights For Me. Love sonas. (CBS) 318089 Michael Jackson

Thriller. Billy Jeon; TI Girl Is Mine: etc. [Epic] 342105. Bongles-Different Light. Mani-Monday: more

322024. Huey Lewis & The News—Sports. Bad Is Bad; etc. (Chrysalis)

314443 Neil Diamond's 12 Greatest Hits, Vol. 2. You Don't Bring Me Flowers (with Barbra Streisand); erc. (Columbia).

343624. Wynton Marsalis Plays Trumpet Concertos. Haydn, Hummel, L. Mozart. (Digital -CBS Masterworks)

308049-398040. Creedence Clearwater Revival Featuring John Fogerty/Chronic Greatest hits, (Counts as 2-Fantasy)

219477. Simon & Garfunkel's Greatest Hits. El Condor Pasa; Bridge Over Troubled Waters: etc. (Columbia)

333112. Andreas Vollenweider-White Winds. The inventive harpist's latest (Digital CBS) 331645. Madonna-Like

A Virgin. #1 album & hits Moterial Girl; Angel. (Sire) 328435. Prince And The Revolution—Purple Rain. # hit: When Doves Cry.

(Warner Bros.) 316604. Tchaikovsky: 1812 Overture; Marche Slave; Beethoven:

Wellington's Victory. Lorin Maazel, Vienna Phil. (Digital-CBS Masterworks) 342097. Barbra Streisand—The Broadwoy Album.

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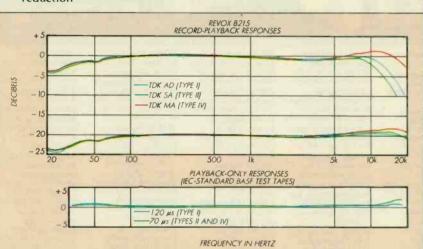
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FEATURES

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- memories

 Dolby HX Pro
 headroom-extension
- □ Dolby B and Dolby C noise reduction

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- Selectable fade in/out
 Serial-port computer-control interface and optional infrared remote control
- ☐ Switchable FM-multiplex filter☐ Selectable control by external
- timer



LABORATORY MEASUREMENTS

Fast-forward time (C-60): 51 seconds

Rewind time (C-60): 52 seconds

Speed error: +0.27% Dolby tracking error: Dolby B, +0.5, -0.5 dB; Dolby C, +2.0,

-0 dB Wow-and-flutter: 0.024% wrms,

0.040% DIN peak-weighted Line input for indicated 0 dB: 48 mV

Line input for overload 0 dB: 2.85 volts

Line output at indicated 0 dB: 0.80 volt

Meter indication at IEC-standard 0 dB: +0 dB

☐ Tape: TDK AD (Type I, ferric)
IEC 0-dB distortion: 1.1%
Meter indication at 3% thirdharmonic distortion: +3.0 dB

 Signal-to-noise ratios (in decibels):

 Unwtd.
 A-wtd.
 CCIR

 NR off
 49.7
 54.6
 52.5

 Dolby B
 57.0
 63.5
 56.6

 Dolby C
 59.0
 68.7
 71.6

☐ Tape: TDK \$A (Type II, chrome-equivalent)
IEC 0-dB distortion: 0.95%

Meter indication at 3% thirdharmonic distortion: +3.6 dB Signal-to-noise ratios (in decibels):

NR off 53.7 58.5 56.2 Dolby B 58.9 67.0 66.3 Dolby C 61.0 72.7 75.3

☐ Tape: BASF CR-M II (Type II, CrO₂)

IEC 0-dB distortion: 1.1% Meter indication at 3% thirdharmonic distortion: +4.1 dB

 Signal-to-noise ratios (in decibels):

 Unwtd.
 A-wtd.
 CCIR

 NR off
 54.9
 60.1
 58.3

 Dolby B
 60.8
 68.3
 68.4

 Dolby C
 62.4
 73.6
 77.1

☐ Tape: TDK MA (Type IV, metal)

IEC 0-dB distortion: 0.73% Meter indication at 3% thirdharmonic distortion: +6.4 dB Signal-to-noise ratios (in decibels):

 Unwid.
 A-wid.
 CCIR

 NR off
 56.0
 60.7
 58.2

 Dolby B
 62.2
 69.6
 68.5

 Dolby C
 64.0
 74.8
 77.3

tape type vary slightly in their characteristics, the Revox B215 also incorporates a sophisticated, microprocessor-controlled alignment procedure. The user presses a button to begin the procedure, which takes about 20 seconds. The deck records and analyzes a brief series of inaudible tones, using the results to optimize recording bias, playback equalization, and sensitivity for the selected tape. Following these internal adjustments, the tape is rewound to the beginning. The B215 provides nonvolatile storage of the optimized settings for two brands of ferric, three of CrO2-type, and one of metal

Since different brands (or even batches) of the same tape type vary slightly in their characteristics, the Revox B215 incorporates a microprocessor-controlled alignment procedure.

tape, so the procedure need not be repeated unless you change to a new brand.

Levels are indicated on a pair of twenty-four-segment-per-channel, peak-reading liquid-crystal displays, calibrated from -30 to +8 dB. The calibrations in the -6- to +8-dB range were in increments of 1 dB, facilitating very accurate level setting. When Type I or Type II tape is being used, the indicators are frequency-equalized to help avoid treble saturation.

Record levels can be set manually with a pair of up/down pushbuttons or automatically by pressing a SET LEVEL button during the loudest portions of the program source. Headphone playback volume can be adjusted (independently of the line output level) with a similar pair of up/down pushbuttons. A FADE-IN/OUT pushbutton is provided to create smooth musical entries and exits. Two points on the tape can be selected for programming applications such as repeat play of a specific selection.

No internal provision is made for microphone recording. A defeatable FM stereo multiplex filter is provided, as are connections for remote

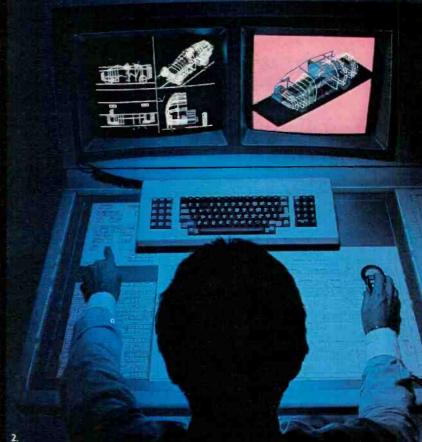
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Designing General Motors to become the first 21st century corporation means going back to the drawing board and looking at ourselves in the light of a new age: the Computer Age.

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control by a computer (using its serial port) or an optional wireless remote control that interfaces with other Revox components. For timer-controlled operation a SAVE STATUS button stores parameters such as record level, Dolby system, tape type, and mode.

The Revox B215 measures 1734 inches wide, 13 inches deep, and 6 inches high, and it weighs a little over 20 pounds. Price: \$1,400. Revox Division, Studer Revox America, Inc., Dept. SR, 1425 Elm Hill Pike, Nashville, TN 37210.

Lab Tests

The playback frequency response of the Revox B215 with both ferric and chrome-type IEC-standard calibrated BASF alignment tapes measured within +1.5, -0.5 dB all the way from 31.5 to 18,000 Hz. The very slight rise at the extreme treble end shown in the graph on page 42 is characteristic of the IEC tapes, but it is normally visible only with decks that fully and properly compensate for head-gap effects.

Overall record-playback frequency response—measured with our calibrated center-line samples of TDK AD (ferric), SA (CrO₂-equivalent), and MA (metal)—was equally impressive. At the bass end there was (as specified) a 3-dB rolloff at 30 Hz. At the normal -20-dB level,

The S/N and wow-and-flutter measurements were among the best we have ever made, Dolby tracking errors were absolutely minimal, and the fast-wind speeds were the fastest we can recall measuring.

high-frequency response from all three tapes was within +1.5, -1.0 dB all the way to our 20,000-Hz measurement limit. Even more impressive was the response at the 0-dB level (which corresponded exactly to the IEC standard of 250 nWb/m). The Dolby HX Pro system maintained a treble response about 6 dB better than is obtainable from fixed-bias recording. Thanks to the automatic optimizing system, fre-

quency response using the Revoxrecommended BASF CR-M II tape was identical to that of TDK SA.

Our signal-to-noise-ratio measurements were among the best we have made (see box). We found that BASF CR-M II gave approximately a 2-dB improvement in S/N, but we have also shown the TDK SA numbers to maintain comparability with our other recent test reports.

The wow-and-flutter measurements were also among the best we have made-so close to the limits of our instrumentation that any slight differences between the Revox B215 and the one or two other decks that have measured this low are probainsignificant. Dolby-system tracking errors were absolutely minimal, absolute tape-speed error was slight, and input/output levels were entirely normal. The fast-wind speeds were the fastest we can recall measuring. Our one minor complaint is that the input-overload capacity of the B215, 2.85 volts, is lower than that of most other highquality decks. But unless a CD player with an unusually high output is used as a source, this limitation should have no practical effect on recordings.

Comments

measurements certainly place the Revox B215 among the two or three cassette decks that could with good reason be called the finest in the world. Our listening tests did nothing to contradict such an assessment. Its clarity, full frequency response, and effortlessly clean recording and reproduction make it a legitimate rival with our reference deck. In instantaneous comparisons we could spot very, very slight differences. The Revox seemed to have, if anything, a slight advantage in high-level treble response. Our reference deck had, if anything, a slight advantage in hiss level and modulation noise.

The differences were so subtle, however, that we certainly could not always hear them, and on that basis we have to conclude that we would be more than happy with either deck. When you're this close to perfection in audio reproduction, you don't have to pick *the* winner to be a winner.

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JAMO CBR 120 SPEAKER SYSTEM

Julian Hirsch, Hirsch-Houck Laboratories

HE CBR 120, part of a new line of "Digital Monitor" speakers manufactured in Denmark by Jamo, is distinguished by an unusual physical shape and style. The CBR stands for Center Bass Reflex, an appropriate description of Jamo's unusual woofer design. The woofer is in effect mounted at the end of a rigid tube of the same diameter as the woofer's basket rim. The other end of the tube is open to the inside of the speaker cabinet. A second tube, extending inward from the moldedplastic speakerboard, surrounds the inner tube. The woofer and its attached tube are suspended from the speakerboard on four rubber mounts designed to minimize vibration transmitted to the cabinet from the woofer. The space between the two tubes forms the ducted port of the bass-reflex enclosure, with the

woofer being concentric with the port. Jamo engineers feel that this design improves the performance and sound of the speaker.

The CBR 120 has an 8-inch woofer, crossing over at 820 Hz to a 4inch midrange cone driver. The second crossover, at 4,900 Hz, is to a 1-inch dome tweeter. The three drivers are vertically aligned on the speakerboard, which slopes backward at an angle of 4 to 5 degrees. A level control on the front of the speaker, accessible when the grille is removed, can reduce the tweeter's output by as much as 13 dB. The tweeter is also protected against excessive drive levels by an internal circuit that lights a red LED below it when an overload occurs.

The CBR 120's specifications include an 8-ohm impedance, a sensitivity of 91.2 dB (measured at 1 meter with a 1-watt input), and a

recommended maximum amplifier power rating of 120 watts (180 watts of music program). The enclosure measures 271/2 inches high, 133/4 inches wide, and 1134 inches deep at the base, and it is available in walnut, "anthracite" (black), or white finishes. Each speaker weighs 371/2 pounds. Price: \$400 each. Jamo Hi-Fi USA, Dept. SR, 425 Huehl Rd., Northbrook, IL 60062.

Lab Tests

The averaged room response of the Jamo CBR 120 speakers was quite uniform from 1,500 to 20,000 Hz, but there was a dip in the 350to 1,000-Hz range and an increased output in the upper bass, from 100 to 200 Hz. The close-miked woofer response reached its maximum between 150 and 180 Hz, with the output falling off at higher and lower frequencies. The acoustic crossover between the woofer and its port was at 50 Hz. The combined output of the woofer and port fell rapidly below 60 or 70 Hz.

Because the woofer's response curve and the system's roomresponse curve overlapped for several octaves, we had no difficulty splicing them to form a composite frequency-response curve. composite curve's most obvious features were the midbass rise and the lower-midrange response dip immediately above it. The overall response was ±6 dB from 63 to 20,000 Hz, but the variation from 1,000 to 20,000 Hz was only ± 2.5 dB. The minimum impedance of the CBR 120 was 6 ohms at 170 and 2,300 Hz, with three maximum readings between 23 and 32 ohms at 31, 83, and 700 Hz. The speaker's typical impedance was close to the rated 8 ohms.

The horizontal dispersion of the speaker was good, with no more than 3 dB separating the on-axis and the 30 degrees off-axis response up to 10,000 Hz (although the difference increased rapidly above that frequency). The system's sensitivity was 88.5 dB, somewhat less than the rated value but fairly typical of systems of its size.

When we drove the speaker with a constant 3.37 volts (equivalent to a 90-dB sound-pressure level in the midrange), the output distortion was less than 1 percent from 100 to

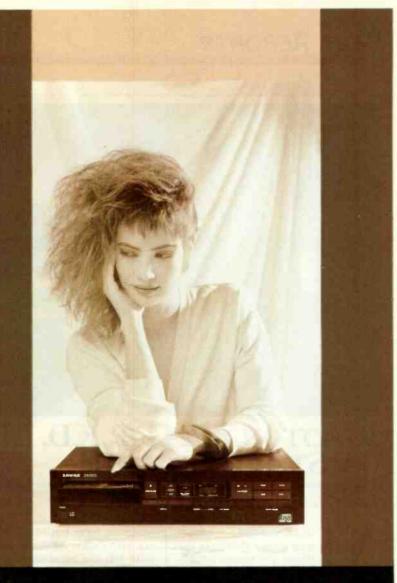
65 Hz, rising to 5.8 percent at 50 Hz and 9 percent at 35 Hz. High-power pulse tests showed that the CBR 120 could easily cope with any input level it is likely to receive. At 100 Hz, the woofer reached its linear limits at 105 watts (into 12 ohms). At 1,000 Hz, the midrange cone could take 850 watts into its 18-ohm impedance, and at 10,000 Hz the dome tweeter absorbed 1,560 watts (into 7 ohms) without excessive distortion or damage.

Comments

For our listening tests we placed the Jamo CBR 120's about 2 feet from the rear wall and several feet from any side wall. Our initial impression was of a rather prominent bass combined with a crisp and sometimes "edgy" top end. The measured response was fairly consistent with what we had heard from the speakers. After the tests, we experimented with the tweeter level control and found that a -7-dB setting removed the irritating treble quality and made the speakers much more listenable. There was little we could do about the prominent bass, which fortunately was not unpleasant or even particularly obvious except on male voices, to which it imparted the chestiness that is common to so many loudspeakers.

These speakers give an impression of delivering a deeper bass than they actually do, probably because of the shape of the woofer's response curve. The upper middles and highs are genuine, however, and sound fine. In our room, the tweeter level control was the key to making the system live up to its promises. (Some early production models of the CBR 120 were front heavy, but Jamo has rectified the problem by supplying special stands that stabilize the speakers.)

The Jamo CBR 120 is an attractively styled, compact speaker system with the ability to handle large power peaks (and to protect itself against tweeter burnout). Like any speaker, its sound is quite dependent on its acoustic surroundings, but judicious use of its tweeter level control, as well as some experimentation with placement, should pay rich rewards in enjoyable listening. Circle 142 on reader service card



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RECOTON V624 F.R.E.D. III TV Stereo Decoder

Julian Hirsch, Hirsch-Houck Laboratories

ULTICHANNEL television sound (MTS) is the stereo TV sound broadcasting system authorized by the FCC for use in the United States. Actually, stereo sound is only a part of the capability of MTS, though it is the one of most concern to the typical viewer. In addition to its stereo audio channels (like stereo FM radio broadcasts. they are heard in mono through most existing TV sets), MTS provides for a secondary audio program (SAP) and a narrow-band-width "professional" channel suitable for voice or data transmission. A typical application for the SAP channel is to carry a simultaneous transmission of the main program in another language (the system has been used in that way for a number of years in Japan).

MTS is only about a year old in this country, though for much of that time only a few stations were equipped to broadcast it and there were almost no stereo programs to be broadcast, to say nothing of a general lack of stereo TV's to receive them. Many recent TV sets.

however, have built-in MTS decoders with line-level stereo audio outputs that can be connected to a separate audio system. Some TV sets have built-in amplifiers and speakers to play the stereo program, although the resulting stereo effect is usually very limited.

For almost a year, too, a number of VCR's have included MTS decoders, and after-market accessory decoders have been announced by several manufacturers. One of the first of these accessory decoders was the Recoton V622, which the company calls "F.R.E.D." (for Friendly Recoton Entertainment Decoder). That original model has now been joined by F.R.E.D. II (V623) and F.R.E.D. III (V624), which are similar in function but differ in their operating features and circuit details. All three units have line-level audio outputs for driving an external stereo amplifier. In addition, F.R.E.D. III has a small built-in audio amplifier.

The Recoton decoders were designed by Larry Schotz, the creator of some of the most advanced FM tuners ever offered to the hi-fi con-

sumer. He took advantage of the presence of a constant audio carrier frequency within any TV set, regardless of the channel to which it is tuned, to design a simple yet high-performance MTS decoder that can be connected to many TV sets without entering their cabinets. The F.R.E.D. decoders obtain their input signals through a small, flat probe, attached to the decoder with a cable, that picks up the 4.5-MHz audio-carrier leakage present in and around all TV sets.

The Recoton V624 is actually a single-channel FM stereo receiver tuned to the intermediate frequency (i.f.) of the audio section of a TV set. This frequency is derived from the fixed relationship between the transmitted TV video and audio carriers. Regardless of the TV channel's broadcast frequency, the frequency-modulated audio portion of the progam is extracted by amplifying the 4.5-MHz difference frequency between the video and audio carriers and then demodulating it. In the MTS broadcast system, the main audio carrier carries the sum signal (L + R), heard as a normal program through conventional TV sets, and a subcarrier carries the difference signal (L - R). The two signals are combined in a matrix to form the left and right stereo channels. In addition, the MTS system includes a form of dbx noise reduction and high-frequency pre-empha-



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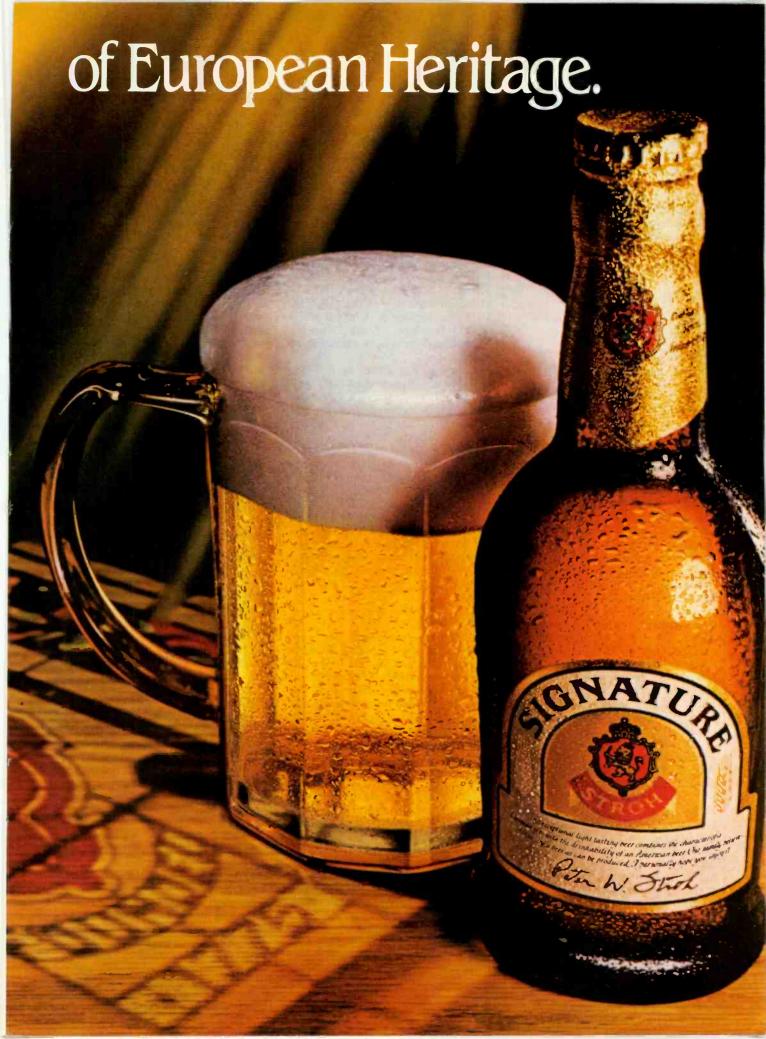
Europe, and over a century here in America.

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Peter W. Strok

Stained Glass Window, Stroh Brewery, 1914. © 1986, The Stroh Brewery Company, Lehigh Valley, Pa.



sis/de-emphasis to improve the audio signal-to-noise ratio.

The coupling probe of the Recoton V624 (like those of the other F.R.E.D. units) picks up enough of the stray i.f. signal leaking from a TV set to be demodulated by its highly sensitive internal receiver circuits. To install the decoder, its outputs are connected to an audio

The Recoton decoders were designed by Larry Schotz, the creator of some of the most advanced FM tuners ever offered. Each of the decoders has line-level audio outputs for an external anplifier.

system. When the decoder, the audio system, and the TV set are all turned on, a hiss similar to FM interstation noise is heard from the speakers. The probe is then placed against the outside of the TV cabinet and slowly moved around it until the TV sound is heard from the speakers. It is usually necessary to probe the entire bottom and back of the cabinet to locate the position that gives maximum signal strength (minimum noise level). The probe is then attached to the TV set at that point by means of its adhesive backing. Once a F.R.E.D. probe has been installed, the TV set's volume control can be left at its minimum setting, since the external stereo amplifier and speakers will play any program's audio, whether it is broadcast in mono or stereo.

All MTS functions are handled automatically by F.R.E.D. III (V624). When a sufficiently strong signal is supplied to it, the word SIG-NAL lights up in its display window. If the signal carries a mono audio program, internal synthesizer circuits convert it to a pseudo-stereo mode through phase-shifting and comb-filter techniques. mode SYNTH appears in the display. If the stereo pilot carrier is present, the unit automatically shifts to stereo decoding and displays the word

Besides the pushbutton power switch, the only operating controls on the front panel of F.R.E.D. III are its amplifier controls-four vertical sliders for volume, balance, bass, and treble. The rear apron contains the spring-loaded speakerterminal clips, audio line outputs, and jacks for the probe connector and an MPX input, with a slide switch to select the desired source. The MPX jack is designed to accept the demodulated multiplex signal from a suitably equipped stereo TV set or VCR, which allows the i.f.amplifying portion of the F.R.E.D. III to be bypassed. A small knob adjusts the level of the incoming MPX signal for proper operation of the decoder.

Although not all cable-TV systems are able to pass the MTS signal in its entirety, many do. For use with suitable cable systems, the Recoton V624 has input and output jacks for coaxial F-connectors, allowing it to be inserted in the cable signal path. It provides an output to the TV on either Channel 3 or Channel 4, as selected by a switch on the rear apron.

The Recoton V624, finished in black, measures 133/8 inches wide. 7½ inches deep, and 3 inches high. It weighs about 7¾ pounds. Price: \$199.95. Recoton, Dept. SR, 46-23 Crane St., Long Island City, NY

Lab Tests

Our bench measurements were made with our signal generator's output, at 4.5 MHz, connected directly to the probe jack of the V624. An output of only about 3 microvolts was needed to light the decoder's SIGNAL and STEREO lights. We made our tests with a generator output of about 300 microvolts, which produced full noise quieting. The theoretical upper frequency-response limit of the MTS system is about 15,000 Hz, since the transmitted pilot carrier at 15,734 Hz must be removed by a filter in the decoder. Although the F.R.E.D. I and F.R.E.D. II use analog filters for this purpose, the F.R.E.D. III features digital filtering. Its frequency response (at the standard modulation level of -17 dB, or 14 percent) was flat within ± 1 dB from 20 to 10,000 Hz and down 6 dB at 12,000 Hz. Channel separation was better than 30 dB from 100 to 500 Hz and at least 20 dB from 20 to 10,000 Hz.

The 300-Hz stereo harmonic distortion at 100 percent modulation was 0.32 percent with L = R(mono) modulation, dropping to 0.1 percent with L - R (stereo) modulation and 0.16 percent with either left- or right-channel modulation. The A-weighted stereo noise level (referred to 100 percent modulation at 300 Hz) was -65.3 dB. The SYNTH circuit uses comb filters to separate the mono signal into two channels that have large amplitude and phase differences. It created a strong enhancement of the apparent width of the sound stage accompanied by a "phasey" sound quality.

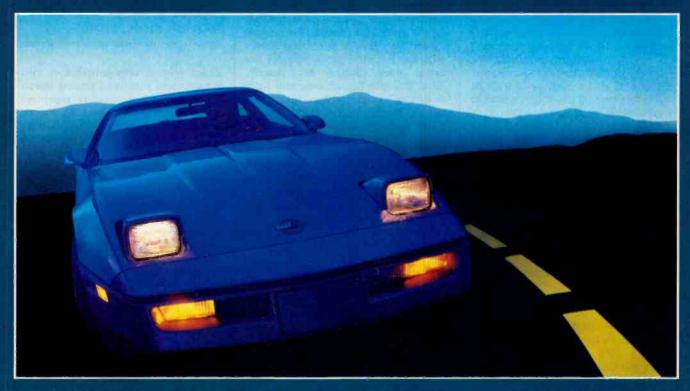
We also made response and crosstalk measurements of the V624 with the modulator signal connected directly to its MPX jack instead of going though the signal generator. The decoder appeared to work identically with either signal source. The installation instructions state, however, that the MPX output of 1985 and later-model RCA television sets is not compatible with the V624 and

Although we have no basis for comparison with similar products, the V624 was a very satisfactory performer in all respects. In most cases only the program material will limit the ultimate sound quality.

that the probe must be used with these sets.

The audio amplifier of the V624. while hardly up to the standards of even a budget-priced home hi-fi amplifier, is a considerable improvment over the amplifiers found in most TV sets. At 1,000 Hz, the amplifier's output clipped at 6.3 watts per channel into 8-ohm loads and at 8.7 watts into 4 ohms. Its harmonic distortion (THD + N) was between 0.41 and 0.69 percent for power levels from 0.1 to 6 watts into 8 ohms, and typically just over 1 percent for power outputs up to 8 watts into 4 ohms. The tone controls had little effect on the midrange (between 300 and 3,000 Hz) but had a very large range in the bass (as much as 22 dB of boost at 30 Hz) and a more reasonable ± 10 -

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Harman Kardon's drive for sonic excellence has elevated the standards of high fidelity for over 30 years. Our striving for the ideal is often con-

sidered "too much" by our competitors. Now the pleasure of "too much performance" is brought to the automotive environment.

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Our competitors must feel that High instantaneous Current Capability, Low Negative Feedback and discrete componentry constitute

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dB range at 10,000 Hz. Care should be used in applying bass boost, however, since the amplifier does not have enough power to support a maximum boost at any but the lowest listening levels.

Comments

The Recoton V624 we tested was a prototype, although it was electrically equivalent to production models in all important respects. We have been informed by the manufacturer that production units will also have line inputs for an external stereo audio source, selectable by a switch. Although we have no basis for comparison with similar products, the V624 proved to be a very satisfactory performer in every respect. It is likely that in most cases the program material, rather than the decoder, will limit the ultimate sound quality.

Although a few broadcast programs today have true stereo soundtracks, the vast majority of what appear to be MTS transmissions (judging by the indicator lights on the V624) are actually either mono or synthesized stereo. Often it is not even that-one of the two MTSequipped stations in the New York area (a PBS outlet) transmits an MTS pilot carrier continuously but apparently does not carry any stereo programs (real or synthesized) except for an occasional simulcast. The other is an NBC station, and most of its daytime programs (as well as commercials) are in synthesized stereo, which can be surprisingly effective in providing a sense of space and ambience.

To those readers who do not consider the available programming a sufficient incentive for converting to MTS, we would like to point out that the generally higher quality of the sound that the inexpensive Recoton V624 produces from the most mundane (or worse) TV broadcasts can probably justify its addition to a home entertainment system. You can convince yourself of this by listening for a while through the V624 and even a pair of budget-priced speakers, and then turning up the volume of the TV set while turning off the stereo amplifier. You won't want to go back to the abysmal sound from most TV sets when you have heard what is already available on most programs-even the commercials!

Although the V624 does not have SAP decoding capability, that is likely to be a minor consideration for most people. A more serious problem is the fact that its probe will not pick up a strong enough signal from some TV sets. Interestingly, the older and cheaper the set, the more likely it is to operate properly with the Recoton probe (simply because older, cheaper sets usually have thin plastic cabinets and little shielding surrounding their circuits). We used the V624 with a small portable color set with good results. With a newer RCA 25-inch set in a wooden cabinet, however, the probe could not pick up a usable signal from any point on the cabinet's exterior. Recoton is aware of this problem and in such cases will supply an insulated internal TV probe at no charge. The internal probe, however, should be installed only by qualified TV technicians or servicemen.

The Recoton V624 (and its sib-

MTS programming aside, the generally higher quality of sound the inexpensive Recoton V624 produces from the most mundane TV broadcasts can justify its addition to a home entertainment system.

lings) offers a very satisfactory and inexpensive means of getting stereo TV sound from existing receivers not equipped with internal decoders. Furthermore, its stereo-synthesis circuits can improve even mono broadcasts. Whatever the program source, passing it through F.R.E.D. and listening to it through reasonably good speakers (and, even better, a more powerful external hi-fi amplifier) will usually make a dramatic improvement in the quality of TV sound. You probably never suspected how little of the transmitted signal you have been hearing! Circle 143 on reader service card



"... And the owner's manual, sir? Do you wish the hardcover issue for \$59.95, or the paperback for \$11.95 . . . ?'



A classic truck? Well, sure.

The pickup is a classic of sorts, with over five decades of service to mankind to its credit. But the GMC S-15 4X4 Pickup is a classic departure from trucks as they are commonly perceived.

Its rakish looks and sophisticated comforts allow this GMC truck to do virtually anything a car can do. And its insta-Trac four-wheel drive, double-wall cargo box and optional V-6 engine allow our pickup to do a lot of things a car could never do.

The GMC S-15 4X4 Pickup. If you're into fine cars, it's time you discovered fine trucks. Buckle yourself into one soon at your nearby GMC Truck dealer. And please help preserve America's natural beauty whenever you're out four-wheeling.







HARMAN KARDON HD500 COMPACT DISC PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

ARMAN KARDON'S HD 500 Compact Disc player appears disarmingly simple and basic compared with some of the more elaborate units currently on the market. It is tastefully styled to match other HK audio components, with a satin-finish pale-gold main control panel. A contrasting black strip contains the front-loading motorized disc drawer, three small control buttons, and a display window.

Two of the pushbuttons on the black strip are used to store track selections in the player's memory and to clear the memory. During play, the third button toggles the display between the current track/ index numbers and the elapsed time (in minutes and seconds) within the current track. When the player is turned on and a disc is loaded into its drawer, the display first shows the total playing time of the disc, then the total number of tracks. To the left of the numerical display, illuminated words show when a disc has been loaded, whether it is play-

ing, and the status of the memory and repeat functions.

Flat keys control the basic functions of track stepping and fast scanning (with sound audible) in either direction. A single touch on one of the track keys moves the laser pickup to the start of the next track or back to the start of the current track. When a scanning key is pressed, the playing point advances or recedes at a moderate rate for a few seconds, then speeds up to a rate several times as fast. The REPEAT button causes the player to repeat the entire disc or any programmed sequence until it is pressed again. The A-B button provides a programmable phrase-repeat function.

large (double-width) key marked PLAY/PAUSE toggles between the play and pause modes. Somewhat unconventionally, the HD500 does not have a dedicated (or identified) stop key. The PLAY/ PAUSE key must be held in for at least 2 seconds to stop the playing of a disc.

The front panel also contains a

stereo headphone jack, a small knob to adjust the playing level (for both the headphones and line output), and the pushbutton power switch. The output phono jacks are on the rear apron.

Like some other deluxe CD players, the Harman Kardon HD500 comes with a wireless infrared remote control. The simplicity of the front-panel controls makes the remote equally easy to use, in sharp contrast with some remotes we have seen that are designed to control other system components also, thereby increasing the likelihood of mistakes.

The Harman Kardon HD500 measures 171/2 inches wide, 131/4 inches deep, and 4 inches high, and it weighs 12¾ pounds. Price: \$600. Harman Kardon, Dept. SR, 240 Crossways Park West, Woodbury, NY 11797.

Lab Tests

The frequency response of the HD500 was almost perfectly flat, varying less than 0.1 dB overall from 20 to 8,000 Hz. There was a very small high-frequency rise, to a maximum of +0.3 to +0.4 dB at 18,500 Hz, and a return to the reference level at 20,000 Hz. The levels of the two channels were identical.

The square-wave response of the player showed that it uses digital

low-pass filtering to remove ultrasonic components from the output of its D/A (digital-to-analog) converter. The maximum output from a 0-dB recorded level was 2.34 volts into an EIA-standard load.

The interchannel phase shift, which was only a few degrees in the 100- to 1,000-Hz range, rose at higher frequencies to 40 degrees at 20,000 Hz. The fact that the phase shift doubled with each octave increase in frequency above 5,000 Hz indicates a time difference of about 5.5 microseconds between channels. suggesting that the player uses twotimes oversampling but a single D/A converter multiplexing between channels. The manual states, however, that the HD500 uses a 44.1-kHz sampling rate.

When we measured the phase shift on an oscilloscope, we noticed an appreciable amount of ultrasonic frequency content superimposed on audio tones between 10,000 and 20,000 Hz. Spectrum analysis showed that these ultrasonic components resulted from beats between the signal frequency and the 44.1-kHz sampling frequency. In the worst case, at 20,000 Hz, the spurious 24,100-Hz component was at a -20-dB level. Evidently the low-pass filters were not able to remove these inaudible components sufficiently from the D/A converter's output.

The playback distortion at 1,000 Hz was slightly higher than we have measured from other CD players. It decreased from 0.032 percent at 0 dB to 0.008 percent at -20 dB, and it was not affected by the setting of the output-level control. The listening volume with medium-impedance headphones was excellent. The noise level was very low, -97.7 dB unweighted and -101 dB with Aweighting. The channel separation was 82.5 dB at 100 Hz, narrowing steadily at higher frequencies until it reached 56.5 dB at 20,000 Hz.

The laser pickup slewed from Track 1 to Track 15 of the Philips TS4 test disc in 5 seconds, not as fast as some players we have tested but certainly fast enough for any normal use. The transition from Track 17 to Track 18 of that disc, which are not separated by any silent interval, was made flawlessly. The player's resistance to physical

FEATURES

- ☐ Front-loading with motorized disc drawer
- Three-beam laser pickup
- Switchable display Usable with external timer ☐ Skip to start of current or next
- track ☐ Audible fast scan in either direction
- ☐ Programming of up to fifteen tracks in any order
- ☐ Repeat programmed sequence, entire disc, or defined phrase
- Headphone jack Front panel output-level control Wireless remote control duplicating all normal control

LABORATORY MEASUREMENTS

Maximum output level: 2.34 volts Total harmonic distortion at ,000 Hz: 0.032% at 0 dB; 0.025% at -6 dB; 0.02% at -10 dB; 0.008% at -20 dB

Frequency response: 20 to 20,000 Hz +0.4, -0 dB

Signal-to-noise ratio: 101 dB (A-weighted)

Cueing time: 5 seconds Channel separation: 77 dB at 1,000 Hz; 56.5 dB at 20,000 Hz Impact resistance: sides, B; top, B

Cueing accuracy: A

functions

Defect tracking: played all defects on Philips TS4A test disc without audible error

shock was reasonably good but not exceptional. Tapping its top with the fingers usually had no effect on the playback, but a light slap with the palm often caused the player to mistrack.

Comments

It is an interesting commentary on the state of the audio art that the near-perfect electrical performance of most CD players makes even the smallest departure from that degree of refinement seem like a flaw. We refer specifically to the measured distortion—and, to a lesser degree, the channel separation—of the Harman Kardon HD500. After all, no analog program source has distortion as low as ten times the 0.032 percent that we measured from the HD500 at 0 dB. Yet the fact that the distortion of many other CD players is a fraction of that figure, and that HK's own specification is 0.01 percent, may make it seem that the HD500 is less than it should be. Similarly, the best analog sources are likely to have 40 to 50 dB less separation at any frequency than we measured from the HD500.

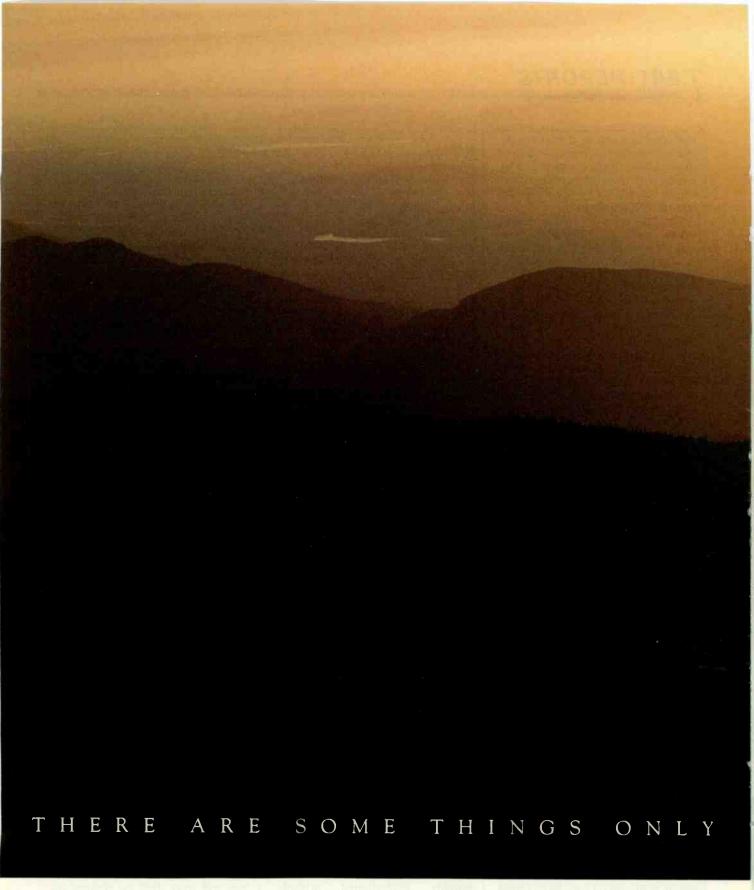
Quibbling about this sort of discrepancy seems to us like an unreaperfectionist attitude. There was nothing in the audible performance of the HD500 less than equal to the best CD players we have heard. It is likely that those people who condemn digital sound per se will object to the sound of the

HD500, but they would do that even if it were literally perfect. Anyone who normally enjoys listening to CD's will surely be pleased by what comes out of the HD500.

The HD500 is an uncommonly easy-to-use, logically designed product, and a handsome one to boot. It was a pleasure to be able to operate it without squinting at a host of small, crowded buttons or keys. It has all the controls it needs, and the others will not be missed. Except for its unusual method of stopping play, the HD500 can be used with a high probability of success before reading the instruction manual.

The audible performance of the Harman Kardon HD500 was equal to the best CD players we have heard, and it is uncommonly easy to use and handsome to boot.

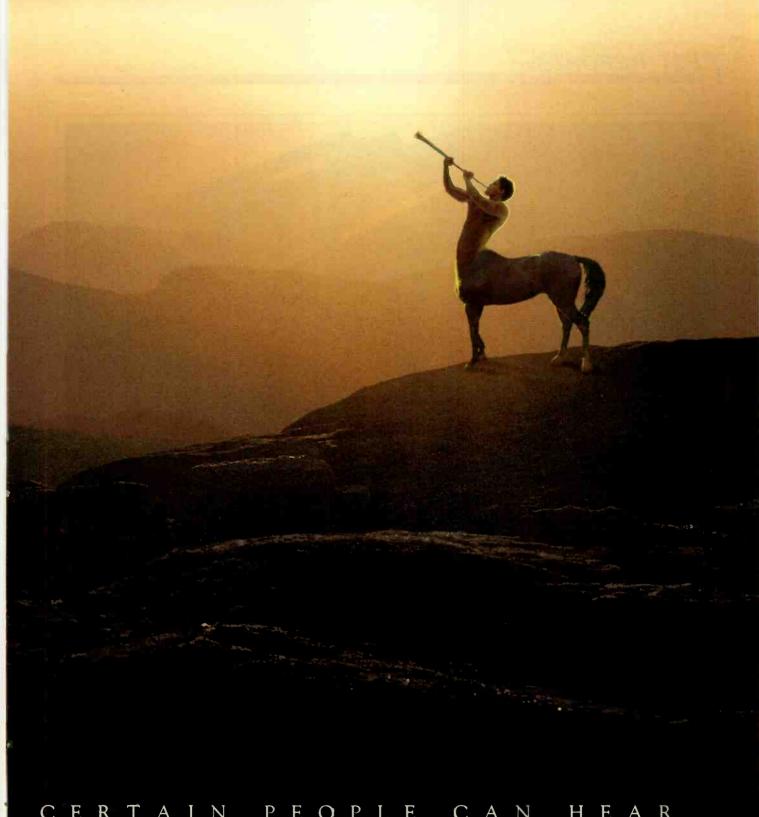
We also note with approval the inclusion of a playback-level control, which seems at last to be an expected feature of a good CD player. Finally, the remote control was not only able to operate the player reliably over distances of 20 feet or more, but it would even function when its infrared beam was bounced off a wall instead of being aimed directly at the HD500. Circle 144 on reader service card



A centaur's horn cries hauntingly. A siren's song whispers untold promises. For listeners with discerning ears, those rare and magical sounds can be a reality. A reality evoked by a speaker possessing a higher fidelity. Altec Lansing.®

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CIRCLE NO. 17 ON READER SERVICE CARD



НІТАСНІ DA-P100 COMPACT DISC PLAYER

Julian Hirsch, Hirsch-Houck Laboratories

HE Hitachi DA-P100 portable CD player is designed to operate from a.c. power, internal batteries, or (with an optional adaptor) a 12-volt automobile battery. Slightly larger than the smallest portable CD players, since its batteries and a.c. power supply are within its case, the DA-P100 is still a mere handful, measuring less than 71/2 inches wide, 63/8 inches deep, and 1% inches high. Without batteries, it weighs about 2 pounds, 10 ounces.

The DA-P100 has an LCD display window that shows the current track number, the playing time on that track, and the machine's operating status (play, pause, repeat, scan, and battery condition). Pushbuttons control the PLAY/PAUSE functions (on alternate operations), STOP, TRACK SKIP in either direction, and FAST SEARCH in either direction (with the program audible at a reduced level).

Smaller buttons activate the repeat function (for the current track or the entire disc) and S&P (Scan and Play), which plays the first 10 seconds of each track before proceeding to the next one. A LOCK button prevents the top-loading disc area from opening accidentally.

The front edge of the player contains a sliding power switch, a stereo headphone jack for a 1/8-inch miniature plug, and two slider controls that affect only the headphone output. One of these controls adjusts headphone volume and the other is marked TONE, with LOW and HIGH at the extremes and an index mark at the center of its range. The back edge of the player has a socket for the detachable a.c. power cord, a

d.c. power input for use with an external 12-volt adaptor, and a lineout jack for a 1/8-inch mini plug. The DA-P100 comes with a slender cable that plugs into this line-out jack and terminates in conventional phono plugs for connection to a system amplifier. A removable cover on the bottom of the unit gives access to the battery compartment.

The major performance specifications of the Hitachi DA-P100 are much like those of other CD players, including a -90-dB noise level (A-weighted), 0.008 percent distortion, 85-dB channel separation at 1,000 Hz, and a 1.8-volt output. The frequency response is rated as 20 to 20,000 Hz +1, -3 dB. According to the manufacturer, a set of six fresh alkaline AA cells should give about 21/2 hours of operation. Price: \$399.95. Hitachi, Dept. SR, 401 W. Artesia Blvd., Compton, CA 90220.

Lab Tests

With the audio output of the Hitachi DA-P100 terminated in an EIA standard load of 10,000 ohms in parallel with 1,000 picofarads.

Introducing The One Remote That Does The Work Of Four.



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Things are getting out of control. Separate remotes for your TV, VCR, stereo, CD or cable converter can be more control than you can handle.

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AUDIO CONTROL PHASE COUPLED ACTIVATOR



by William Burton

udio Control's Phase Coupled Activator (\$259) is designed to restore bass frequencies lost from music in the course of recording, processing, manufacturing, and playback. To do this, it analyzes the low-frequency signals, decides which notes are harmonics of missing fundamentals, and then creates frequencies one octave lower than these harmonics. Similar devices are called subharmonic synthesizers because they synthesize subharmonics from existing bass frequencies.

The PCA is not designed to make a harpsichord sound like a pipe organ or turn Mozart into Iron Maiden. It is designed to restore low frequencies that are often sacrificed because of the limitations of vinyl or for other reasons. Audio Control claims the PCA will "significantly improve the sound of your system and every source you play into it (with the exception of certain heavy-metal records which are beyond help)."

Obviously, if your system can't reproduce really low frequencies, a subharmonic synthesizer will have little effect. But if your speakers can reach into the subterranean depths of sound or if you have a subwoofer extending the frequency response, a subharmonic synthesizer can re-

create lows that will shake your walls. The circuits may be fooled, however, into synthesizing false notes that never were and shouldn't be; a human voice sounds quite odd when it is doubled with frequencies an octave lower than the voice itself.

The front panel of the PCA has a power switch, a DETECTION RATIO knob that adjusts the effects of the

On one song that I had always heard as a duet between acoustic and electric guitars, the Audio Control PCA revealed a delightful bass-guitar counterpoint that had been lurking in the background.

unit, a bypass button labeled DIGITAL RESTORATION, a source/tape button (replacing the one on the amplifier or receiver), a switch for video-audio input, and crossover controls (subwoofer in/out and subwoofer output level). The detection-ratio control changes the sensitivity of the PCA (to signals from which it creates fundamentals) and the in-

tensity of the fundamentals that it creates. With small speakers and bass-shy sources, turn the knob up; with subwoofers and sources with adequate bass, turn it down.

If you add a subwoofer to your system to reproduce the lows created by the PCA, you will not need an extra crossover because one is built into the PCA. Its crossover frequency is set at 90 Hz, but your dealer can reset it to any frequency between 20 and 20,000 Hz to suit your speakers. The crossover slope is 18 dB per octave. Two inputs are provided, one for audio sources and one for video.

As a former bass guitarist who enjoys loud low-frequency sound, I want the bass I hear in concert reproduced in my living room, and I thought my system already had pretty good bass. Low frequencies are handled by an M&K subwoofer with a built-in 100-watt amplifier, a crossover, and a 12-inch driver. Rated to go down to 24 Hz (within 3 dB), the subwoofer reproduces the lows in the music, and the midrange gains clarity and transparency because the woofers in my B&W DM110 satellites do not have to reproduce those low frequencies.

Adding the Phase Coupled Activator to this system produced some interesting results, almost all of

which I liked. With music that has electric guitar and bass, synthesizers, and so forth, I found the effects of the PCA always pleasing, even with the detection-ratio control and the subwoofer level cranked to the max. Since signal processing has probably already been applied in such recordings, there is no reason for you not to modify the sound according to your own tastes if they differ from those of the producer or engineer.

With acoustic music, extreme settings can create an unnatural heaviness that I sometimes found unpleasant. Reducing the detection ratio or bass boost removed the false bass. With acoustic guitar—as on the beautiful "Private Parts and Pieces" albums by former Genesis member Anthony Phillips-I never encountered undue heaviness. Only the touches of synthesizer, electric bass, or percussion were emphasized by the PCA. On one song that I had always heard as a duet between acoustic and electric guitars, the PCA revealed a delightful bass-guitar counterpoint that had been lurking in the background.

The instruction manual cautions against using any loudness compensation with the PCA, and tone controls should be set flat. I found that following these instructions usually prevented excessive bass response—an occasional problem I was rather glad to have instead of a shortage of low frequencies.

The manual advises that the best results are produced with sources that have had the bass frequencies rolled off. Since this applies to most sources (Compact Discs less than others), you can leave the PCA switched in all the time unless you hear excessive bass.

Choosing source material likely to be lacking in bass, I listened to an LP of Artie Shaw recordings from the Big Band era. The PCA brought out the string bass, making it clearer, more forward, and focused in the center right of the soundstage. Songs that seemed flat and dull with the PCA switched out sounded natural with its added effect. Vocals were fine, with no boominess.

On the Delos CD of Beethoven's Sixth Symphony, the PCA added authoritative growl and bite to the string section's low frequencies, but the effect could be a bit boomy. "Rickie Lee Jones," an exceptionally well-recorded LP, gained impact and punch with open and extended bass. On the CD "Out of This

World," with John Williams conducting the Boston Pops, Strauss's Also sprach Zarathustra seemed richer with the PCA in. The digital drum strokes did cause my left satellite to resonate against the subwoofer beneath it unless I cut the detection ratio or the subwoofer level to a more reasonable setting.

When I ran signals through the PCA from Denon's test CD, a sweep from 20 to 20,000 Hz caused no spurious doubling of the lower frequencies. Neither a 100-Hz sine wave nor a 100-Hz square wave

I compared the effect of the PCA with cranking up the bass control on my receiver. Both added punch, but the bass control made the sound boomy—male voices became horribly unnatural—while the PCA added clarity.

fooled the circuits, although the test signals did fry the power supply in my subwoofer. While the PCA is capable of synthesizing prodigious amounts of bass energy, Audio Control informed me that they had had no complaints that the unit was blowing fuses, destroying drivers, or otherwise damaging speakers. And the M&K subwoofer failed only under the most extreme level of sonic abuse.

I compared the effect of the PCA with cranking up the bass control on my receiver. Both added impact and punch, but the bass control on the receiver made the sound boomy—all male voices became horribly unnatural—while the PCA added clarity and definition to the bass. In using the PCA, I found that it was only rarely fooled by male voices. On one occasion when the voice of a male announcer on FM was accompanied by low thumps from the subwoofer, switching out the PCA removed the thumps.

Despite my appetite for bass, the combination of the PCA with my subwoofer could produce bass that was excessive, even by my standards. In every case, simply turning down the subwoofer level or adjusting the detection-ratio knob on the PCA solved the problem.

It is generally claimed that the source of low frequencies cannot be localized. I found, however, that the PCA tightened up the source of bass notes, positioning them across the width of the soundstage.

All told, I decided that Audio Control's Phase Coupled Activator is a worthy addition to my system. In the vast majority of cases, its signal processing adds to the illusion that the music is real, not reproduced. The PCA gives subwoofers something to do, and I like what it makes them do.

For more information and the address of your nearest dealer, write to Audio Control, Dept. SR, 6520 212th St. SW, Lynnwood, WA 98046.



"... Yes, Mr. Gwertzman, they're booked for Alice Tully Hall on the 21st, but we've got a little problem. Can you change the advertising copy? They no longer call themselves the Boston String Quartet. They've changed their name to Gut Reaction.... That's right, Mr. Gwertzman, Gut Reaction!"

"CARVER CD PLAYER: SUPERB SOUND PLUS THE DIGITAL TIME LENS"

AUDIO MAGAZINE

"Leave it to Bob Carver to come up with a CD player designed to please both those who love CDs and those who still have reservations about their sound quality." —Leonard Feldman AUDIO MAGAZINE



The Carver Compact Disc Player answers the audiophile's demand for a CD Player which provides not only the greater dynamic range and richer bass expected from compact disc technology, but also the musicality, spectral balance and spatial qualities of well executed analog high fidelity recordings.

LOGICAL

How logical it is for a physicist dedicated to delivering music with maximum dynamic impact to offer a state-of-the-art CD player. Anyone who ever wondered why Carver makes amplifiers capable of delivering hundreds of watts of power need wonder no longer after they have heard the Carver Compact Disc Player as a sound source.

There are dozens of models of compact disc players now available, many of them demonstrating little regard for the finer points of digital playback technology. Bob Carver was in no hurry. He wanted to do digital right. And he did.

The state of the art has advanced considerably since the first players appeared several years ago. The Carver Compact Disc Player makes use of the latest triple laser beam pickups, sophisticated oversampling, digital

filtering technology and, very importantly, Carver's unique distortion reducing **dither signal** that effectively removes the low level quantization distortion existing in all other CD players.

Except for features like display and programming, the real determining factor in CD player quality is its ability to reconstruct music from digital information bits. And that is not an easy job nor one that can be effectively achieved while skimping on circuitry.

IMPROVED TRACKING

The Carver Compact Disc Player reads discs with more precisely focused laser power than most other models, resulting in improved tracking and less chance of drop-outs when dust or smudges are encountered on a CD.





The Digital Time Lens circuity restores the octave-to-octave balance originally intended by the musician and recording engineer.

DIGITAL FILTERING

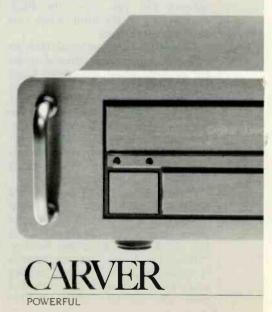
Along with a potentially audible signal ranging up to 20kHz, there are endless images of the signal at 40kHz, 80kHz and 160kHz. While they are above the range of human hearing, they must be removed from the signal to prevent harmonic problems which could turn into audible distortion. Earlier CD models placed an anti-imaging filter after the digital/analog converter stage. Carver uses DIGITAL filtering ahead of the D/A converter through a process called multiple oversampling. The sig-

nal is passed through a shift register which delays the samples, so that the weighted average of a large number of signals is generated. Through a complicated process, frequency bands are suppressed between 20kHz and 160kHz, eliminating harmonic distortion problems early on before the complicated D/A 16 bit translation

The same oversampling process also distributes the same amount of noise over twice as wide a frequency range, resulting in half as much noise in the final signal. Then after translation to analog, the signal is once again filtered for a gentle roll-off above 20kHz. This yields a marvelously natural musical sound to the final output.

ABSENCE OF PHASE ERROR

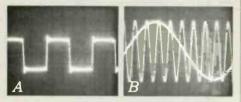
One of the important tests applied to determine the effectiveness of digital-to-analog translation circuitry is the reproduction of a square wave.



Corporation, PO Box 1237, Lynnwood, WA 98046

"Reproduction of a 1kHz digitally generated signal was as close to a true square wave as I have ever seen from a CD player that used digital filtering. (The Carver Digital Disc Player) shows a virtual absence of phase error."

AUDIO MAGAZINE



- A. Square-wave reproduction, 1kHz.
- B. Two-tone phase test signal (200Hz and 2kHz) with Digital Time Lens off.

PLUS THE DIGITAL TIME LENS

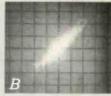
On top of this unerring ability to produce natural, real-sounding music from the CD's digital bits, the Carver Compact Disc Player has the remarkable Digital Time Lens circuit to insure your listening enjoyment.

The Carver Compact Disc Player is the world's **only** compact disc player to address the problem of the bright, hot, harsh sounding midrange and a lack of ambience and spatial detail characteristic of the **majority** of compact discs currently available.

When Bob Carver obtained his first compact disc player, he was surprised at the sound derived from most of the compact discs he purchased. The three-dimensional musical perspective which his analog system provided in lush abundance on phono discs evaporated into a flat, brittle wasteland. After extensive testing, Bob uncovered two fundamental flaws in almost all compact discs: 1) An unpleasant, harsh spectral energy balance. The overall octave-to-octave energy balance was shifted on the CD towards more midrange above 400Hz; 2) The amount of L-R signal (which carries the spacial detail of the music) on the CD was inexplicably, but substantially, reduced

when compared with the amount of L-R signal found on the corresponding analog disc.





- A. Lissajous pattern showing spatial detail (L-R)/(L+R) ratio from an LP record.
- B. The same instant of music but taken from the CD version. Note the decreased (L-R) content, as shown by the narrowed trace.

Carver's circuitry corrects the ratio of L-R to L+R by performing one extra, but important mathematical operation on the signal stream that all other CD players fail to perform. This final operation makes all the difference.

The result is a natural sound with more of the three-dimensional information that places us in the same space with performers. You won't need the Digital Time Lens on all CDs. But it is there when you need it.

In the beginning, Carver hoped, indeed he expected, that once recording artists and engineers became more experienced with CD technology fewer and fewer CDs would require the Digital Time Lens. But both laboratory and listening tests reveal that the great majority of even the most recently released CDs benefits significantly from the Digital Time Lens.

EASY TO USE

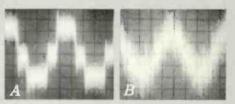
Ease of operation is a hallmark of Carver components and the Carver Compact Disc Player is no exception. A subtle but easy-to-read LCD display not only shows selection number, elapsed time and total time of the CD, but also "talks" to the user. Turn on the Carver Compact Disc Player and the display asks for a disc. When the disc tray is open, the display reminds you with an OPEN readout. When a CD has completed playing, the multi-function display reads END.

With the Carver Compact Disc Player's Programmable Random Access Playback System, track search and programming of different selections is a snap, as is automatic repeat of a previous selection or an entire CD. For classical music lovers, the Carver Compact Disc Player has complete indexing capabilities as well.

The large, easy-to-use feather-touch controls include pause, fast forward and reverse. You can even monitor music at high speed to find a certain portion of a selection.

We know you really enjoy music so, you owe it to yourself to begin your digital experience with the only full feature CD player that has the Carver touch. The only CD player that canactually improve on what is already the best playback medium ever offered.

Audition the Carver Compact Disc Player with Digital Time Lens at your Carver Dealer.

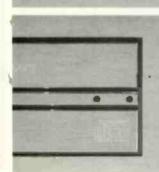


- A. Ultra-low-level (4 significant bits) 1kHz signal, as reproduced by conventional CD players.
- B. Same signal with dither added before DIA conversion by Carver CD player. Note that dither has caused the distorted step-wise approximation of the 1kHz tone virtually to vanish. Quantization distortion has been reduced to insignificance.

IF YOU ALREADY HAVE A CD PLAYER

By buying a CD Player you made a commitment to vastly improve your sound source, now you can go the short extra step that lets digital realize its true potential.

That step is the CARVER Digital Time Lens. Simply connect it between your CD player and your preamplifier or receiver.







EUROPEAN AUDIO TECHNOLOGY

BY E. BRAD MEYER AND PETER W. MITCHELL

HAT audio is an international industry is obvious from the array of foreign brand names on display at your local hi-fi store. Many of those brands are from the Far East, and many others—Fisher, Scott, Marantz, and KLH—sound American but are now owned by Oriental companies. In this atmosphere it is easy to forget that many important advances in audio technology have come from European companies.

The analog disc, magnetic tape recording, the audio cassette, and the digital Compact Disc all originated in Europe, and European audio companies continue to be on the cutting edge of technology. They embody that technology in some of the best speakers, CD players, tape decks, turntables, tuners, and amplifiers made for consumer use.

The European contribution to audio may be more influential in professional equipment than in the consumer market. Walk into a recording session anywhere in the world, whether in London, Nashville, or Tokyo, and you'll find a preponderance of European microphones—among them Neumanns from Germany, Schoeps, Sennheisers, and AKG's from Austria, and B&K's from Denmark.

The microphone signals are likely to be amplified and mixed on a British Neve or Solid State Logic recording console, monitored on British B&W 801 loudspeakers, and recorded on a multitrack tape recorder made by Studer (the Swiss/German parent company of Revox). The music will be transferred to LP on a Neumann (German) or Ortofon (Danish) disc-cutting system, probably using either Pyral (French) master discs or the German Teldec Direct Metal Mastering process. Cassette duplication probably will employ BASF chromium-dioxide tape, and there's a fifty-fifty chance that the CD version will be pressed at the huge PolyGram plant in Hanover, West Germany.

Small and Different

In any discussion of Europe, it is important to keep in mind the effects of scale—France is smaller than Texas, and England is about the size of Illinois. Sometimes the smaller scale permits a mixing of functions that carries practical benefits. In the United States, for the most part, professional audio and consumer companies are separate. In some European firms, however, consumer hi-fi products form one branch of a mainly professional/industrial company.

For example, Studer makes some of the finest studio tape recorders, and its Revox home tape decks share the same construction quality, making for long-term stability and reliability. On the other hand, Tandberg, known for its well-made home cassette decks and tuners, has had some success in selling professional versions of these products to broadcasters.

Although Europe ranks only fifth in size among the continents, and although its inhabitants account for no more than 15 percent of the population of the earth, the influence of European culture is felt around the world.

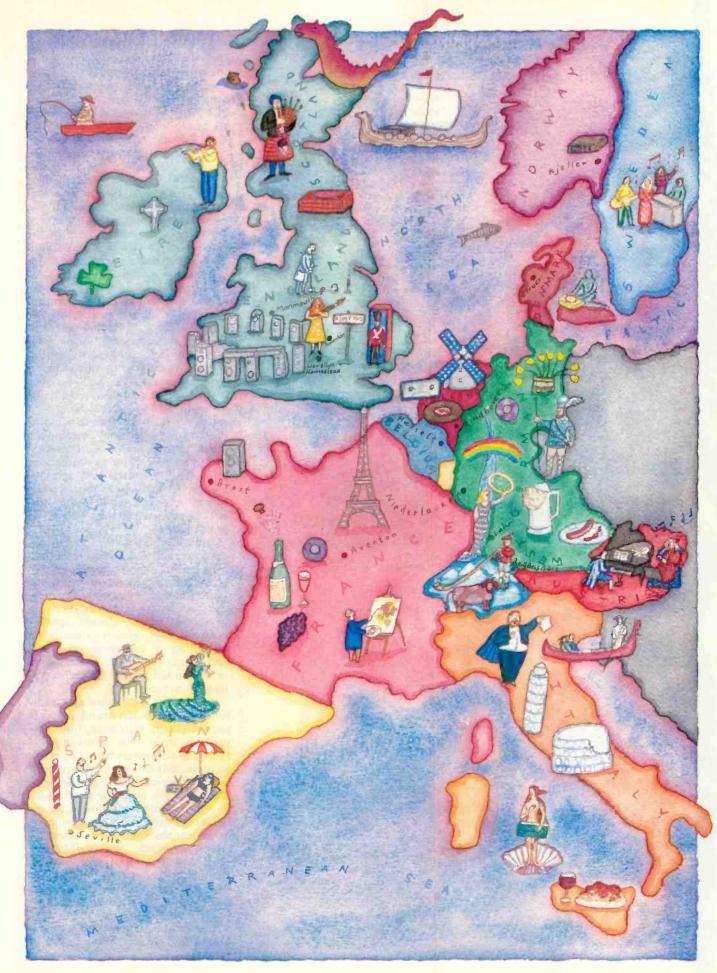
Our audio map of Western Europe includes references to the art and architecture of the various countries as well as to music and audio technology. You should have no trouble identifying the rock group from Sweden or connecting the bowl of yellow tulips with the logo of a famous German record company, but the importance of some of the towns and cities is less obvious.

In France, Brest is the home of the Cabasse speaker factory, and Averton is the site of that country's only CD pressing plant. Revox headquarters are in Regensdorf, Switzerland. In West Germany, Thorens has a factory in Lahr, and Canton has one in Niederlauken.

Philips, one of the world's electronics giants, has its head-quarters in Eindhoven, Holland, and it makes CD players in Hasselt, Belgium. B&O products come from Struer, Denmark. The Tandberg factory is at Kjeller, Norway.

Speaker factories in England are too numerous to identify individually on a small map. Monmouth and Swindon are the sites of two of England's CD pressing plants. English exports of unusual importance to STEREO REVIEW include Sue Llewellyn, the magazine's Art Director, who grew up in a village south of Swindon and considerably west of EMI's Abbey Road studios made famous by the Beatles.

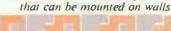
ILLUSTRATIONS-LONNI SUF IOHNSON



Canton speakers from Germany have a high-tech European look that American decorators find especially appealing. Available



finishes include oak, walnut, black lacquer, white lacquer, and gloss mahogany. Canton is also noted for its series of powered subwoofers, which are either sold separately or in three-piece systems with smaller satellite speakers that can be mounted on walls.





Among the companies mentioned above for their professional equipment, several also make highly respected consumer products. Ortofon makes cartridges for home use, and Sennheiser produces high-quality headphones. AKG is known for both cartridges and headphones.

Like the United States and Japan, Europe has its electronics giants. Philips, of Eindhoven, the Netherlands, is one of the two or three largest electronics companies in the world, comparable to Matsushita in Japan and General Electric in the United States. It was the vast Philips research and development facility that invented the Compact Cassette (1963), the LaserVision videodisc (1975), and the Compact Disc (1978, later refined jointly by Philips and Sony before its commercial introduction).

Philips has numerous subsidincluding semiconductor iaries. plants that design and produce many specialized integrated circuits for audio and video use. Most non-Japanese CD players, including most of the "high-end" audiophile machines, such as the highly praised Meridian and Mission units, employ Philips chassis and circuits. CD players made by Philips at a factory in Belgium are sold in the United States under the Magnavox brand name.

Small is still beautiful in Europe, however, and some now well-established European companies started as cottage industries in much the same way as a number of Japanese and American companies. The rapid success of the Canton speaker company in Germany is the result of a kind of entrepreneurial skill and energy that many businessmen in the United States think of as typically American.

Respect for the history and tradition behind familiar brand names is stereotypically European, but competition from new companies is keen. Jamo speakers from Denmark have recently established a presence in the American audio market, and Dali speakers, from the same country, are coming up fast. Cabasse speakers from France are beginning to appear on shelves in American stores alongside the well-known Dual and Thorens turntables and Blaupunkt car stereo units from Germany and Wharfedale speakers and Quad amps from England.

The European audiophile lives in a world quite different from ours. Or perhaps we should say in one of several different worlds, because generalizing about Europe is about as easy as describing America so as to include both Maine fishermen and California beach bums. The European fragmentation can give a national character to certain audio attitudes. England, for example, is homogenous enough to succumb to fads with wonderful completeness. A recent British obsession concerns the physical coupling between speaker and floor. Enthusiasts are mounting speaker cabinets on spiked feet that punch through a soft rug and bite firmly into the floorboards.

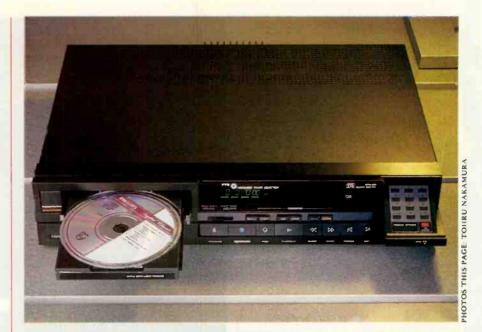
Europe's higher population density also makes it feasible to hold hi-fi shows for consumers, an idea that has met with only limited success in the United States. Swiss-born Reynaud Delapraz, factory consultant to Studer Revox America, Inc., says, "If you have a show in Zurich, anyone in [Switzerland] can get there by train in one and a half hours or less, so he can make the whole trip in one day. It's a reasonable investment-\$20 for the train and \$5 to get in-so the shows are popular."

Broadcasting Sets the Standard

Most American audiophiles who listen to the radio do so despite its sound quality, not because of it. The majority of our FM outlets are commercial rock stations that use heavy compression to increase their coverage, and lots of equalization to give their sound more impact on low-fi car radios and boom boxes. The sound of our AM stations is even worse.

European radio stations, in contrast, are much more careful about sound quality. Even AM outletsknown there as "medium wave"emit a reasonably wide-range monophonic signal. One reason for the difference is that stations over there have until recently been owned and run almost exclusively by governments. (The Swiss government granted its first few private broadcast licenses about a year ago, and many European countries have not yet gotten that far.)

Throughout Europe, live concert broadcasts, rare in America, have long been a staple of FM programming. Most broadcasts employ simple microphone techniques, some of which, notably the BBC's Blumlein array and France's ORTF configuration (named for the Organization Radio-Télévision Française), have



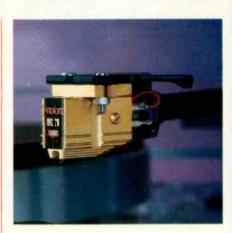




I he Magnavox CDB850 CD player at top and on our cover is manufactured in Belgium by the Dutch giant Philips. It can

remember up to 785 of your favorite tracks on various CD's, automatically skipping the others.

I he Thorens Phantasie turntable. made in Germany, has a Plexiglass chassis and a three-point suspension. It is shown here, and on our cover, with a Danish cartridge, the moving-coil Ortofon MC Super (close up at right), which has a Van den Hul stylus and a carbon-fiber support system.



The analog disc, magnetic tape recording, the audio cassette, and the Compact Disc all originated in Europe, and European audio companies continue to be on the cutting edge of technology. They emobody that technology in some of the best speakers, CD players, tape decks, tuners, turntables, and amplifiers made for consumer use.







Dual's C\$5000 manual turntable (top), from Germany, is belt driven and has a threepoint floating suspension to isolate

the platter and tonearm from the motor and other interference. It also features Dual's Optimum Pivot System for precise groove tracking. Unlike most turntables made today for the American market, the CS5000 can play 78's as well as 45's and LP's. Based in Austria, AKG Acoustics is famous for its microphones and headphones, both of which are used in recording studios worldwide. The K 240 Monitor (left) is a dynamic moving-coil design with an acoustic-resistance baffle to reduce boominess. The similar K 240DF (right) is a diffuse-field equalized headphone designed for uncolored reproduction. Both models are rated for 0.3 percent total harmonic distortion at a sound-pressure level of 95 dB.

gained international renown for their characteristically clear and stable stereo imaging.

For this and other reasons, broadcasting plays a major role in European audio and has given rise to many important developments. Concert broadcasts serve as a reference standard that both speaker designers and audiophiles use when judging loudspeakers. British listeners, for example, have become attuned to precise stereo imaging and are sensitive to the loss of image clarity that can occur when speakers are located near reflecting walls. As a result, most speakers from England are designed for use two or more feet away from the nearest wall, ensuring that the first reflections from the room boundaries will arrive at the listener's ears too late to muddy the direct sound.

Reynaud Delapraz says, "In the French part of Switzerland, the Orchestre de la Suisse Romande broadcasts a two-and-a-half-hour live concert every Wednesday evening. The acoustics are good, and the sound quality is absolutely fantastic." Programs produced to similar standards can be heard in Germany, Scandinavia, and Austria as well, and technology is being developed to distribute high-quality FM signals by satellite.

The world's first widely heard digital audio system was the PCM (pulse-code-modulation) link that the BBC developed to relay its programs from London to subsidiary FM transmitters throughout England, and the EBU (European Broadcasting Union) has been at the forefront of efforts to develop standards for international digital relays.

The limits on private broadcasting are broadening now as governments seek additional sources of revenue. In the States, most people confine their listening to stations in the nearest city, but European listeners want to receive FM signals from neighboring countries, placing unusual demands on both the sensitivity and the selectivity of a tuner. That's why high-end tuners from companies like Tandberg and Revox offer two or even three i.f. bandwidths for maximum selectivity when stations are close in frequency. A tuner's capture ratio must also be very good, according to Tandberg president Tor Sivertsen, "to cope with the severe multipath reflections that we encounter in mountainous terrain from the Alps to the deep valleys and fjords of Norway."

Loudspeakers

It used to be that there were wellknown regional and national differences among speakers, but according to Tim Holl (ex-British speaker designer now working at Bose), these differences have narrowed. "Basically, comparing speaker designs-Italian, British, American, you name it—there is no longer a bright German sound, or a specifically British or New England or West Coast sound. There are obvious individual differences among speakers, but most designers are after the same ends and frequently come up with similar results. Speaker design is becoming more of a science and less of an art."

Indeed, Braun speakers produced in West Germany are very much like ADS speakers made in Massachusetts. (This is hardly surprising since they share some component



he Linn Sondek LP-12 turntable from Scotland is a classic. Praised for its simple design, it is also criticized for its finicky setup re-

quirements (usually taken care of by suitably fanatical dealers). It is a basic single-speed, manual, belt-driven turntable with a spring-suspension subchassis. An adaptor is available for playing 45-rpm singles.

Contemporary design characterizes the Bang & Olufsen Beocord 9000 cassette deck from Denmark (lower photo). With a control panel that suggests a spaceship, the Beocord 9000 includes the Dolby HX Pro headroom-extension circuits that were developed by B&O engineers as well as Dolby B and Dolby C noise reduction.











Blaupunkt's German-made "Houston" cassette tuner—shown in top photo installed in the glove compartment of a car—has

a wireless remote control so that backseat drivers can choose from the six AM and six FM presets. The tuner also has station seek, phase-locked-loop circuits, and a digital readout. The autoreverse tape section has Dolby B, locking fast wind, and a music sensor.

The Swiss-German Revox B215 cassette deck has three microprocessors to control bias, level, equalization, tape transport, and the real-time counter. See test report on page 40 for more.



parts.) Speaker companies around the world, including about half of the 200-odd brands on the U.S. market, rely on driver units made in Europe—particularly by Philips (Holland), Audax (France), and SEAS (Sweden). And listeners in many countries increasingly agree on what good speakers should sound like. The Quad, Celestion, and B&W speakers that are held in high regard by British audiophiles are equally esteemed by Americans. Conversely, the best American speakers have been received enthusiastically in Europe.

It wasn't always thus, however. English audio consultant Denis Wratten, who spent years working in the American hi-fi industry, remembers the influence of the BBC and its simple microphone techniques on British designers in the late Sixties: "American loudspeakers at the time were designed to reproduce, as pleasantly as possible, music that was captured by close microphone techniques. British loudspeakers were designed with a view to reproducing accurately material produced by the BBC, and if the records sounded wrong, well, that was because they were wrong."

The BBC also played a more direct role in speaker design in years past. Some popular British speakers (notably the Rogers LS3/5A and Spendor BC-1) were actually designed in the BBC's own labs. They were created, according to Celestion's Graham Bank, "to evaluate broadcast quality, to judge miking, to hear whether mikes were in or out of phase, and so on. The speakers were designed to operate in tiny studios and mobile recording vans. You were supposed to sit very close to them, in the near field."

Their success paved the way for the current generation of small, high-quality British two-way speakers from Celestion, Mission, KEF, and others. It was discovered, says Bank, "that a narrow speaker system with a small frontal area works particularly well for stereo [because of the problem of sound-wave diffraction at cabinet edges]. This led to a whole gamut of narrow, tall speakers, placing a high priority on the presentation of the stereo image—at a time when designers in the States were concentrating on other things, such as realistic reproduction at high levels." This led to the American preference for large three-way systems with high powerhandling capacity.

According to Denis Wratten, further support for small speakers came from a widespread belief in the paramount importance of the "front end" (turntable, arm, and cartridge), an idea promoted heavily by Ivor Tiefenbrun, creator of the Linn Sondek turntable and a leading light of British high-end audio. When a major part of the system budget is devoted to the front end, little money is left for large speakers, and designers were encouraged to refine their smaller, two-way systems. Wratten regards this as fortuitous, because the inherent midrange directivity of the typical 8-inch woofer helps such systems sound better in most listening rooms by reducing the strength of side-wall reflections

Furthermore, adds Bank, "There are fewer things to go wrong in the design of a smaller, simpler speaker. With fewer elements in the system, it's easier to get the design right. The idea that a big three-way is better than a two-way is a little like the advertising notion that a doubleblade razor shaves better than a single blade. People tend to accept the notion, regarding it as obvious, without proof."

Higher population density means that most Europeans live in smaller rooms than we do. Furnishings, too, are different in acoustically significant ways. As Keld Hansson, new products manager of Bang & Olufsen of America, says, the Danish "tend to live in a more high-tech environment than here. Their furnishings would be neither as heavy nor as absorptive." The preponderance of stone and brick in interior walls also reduces low-frequency absorption in comparison with the relatively flexible wood-frame construction that is the American norm. These factors can easily combine to reduce the power requirements of a sound system by a factor of four. At the same time, the more rigid construction reduces the problem of structure-borne feedback from speakers to turntable.

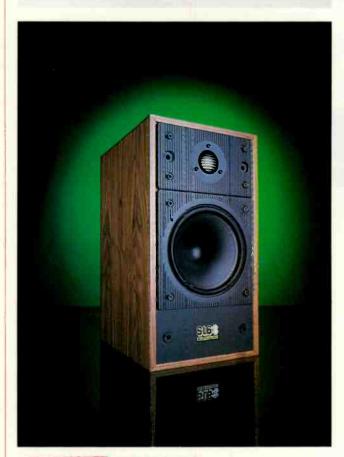
In practical terms, this means that the average British, German, or Scandinavian audiophile achieve both realistic sound levels and adequate bass response using either a smaller amplifier or smaller loudspeakers. According to Delapraz, "Power is not such an important factor in Europe; 75 watts is adequate, and 100 watts is a lot." European speaker companies like Celestion and Braun put sophisticated (and expensive) drivers and





he Galiote speaker, made in France by Cabasse, has a 61/2-inch woofer and a 1-inch tweeter. An optional outboard signal processor called the Active Compensator can be used to adapt the speaker to the acoustics of a particular listening room.







Celestion, a British speaker manufacturer, introduced the SL6S as the successor to its renowned Model SL6. The SL6S has new and improved drivers, and its attractively finished cabinet is designed to be acoustically inert so that it will not add any coloration to the sound.







The Tandberg TCP-3015A Compact Disc player (top) is part of the Norwegian company's 3000 series, which also includes



the 3016A power amplifier and 3018A preamplifier (see test report on page 31). The CD player uses dual digital-to-analog converters that oversample at 176.4 kHz to minimize phase shifts.

Rotel's RA-820BX integrated amplifier (center) is a model of simplicity. The elimination of tone controls minimizes conductors in the signal path. Rated at 25 watts per channel, the British-designed amp has inputs for a tape deck, tuner, CD player, and turntable.

The Cyrus series from England's Mission Electronics includes (bottom photo, left to right) the Cyrus tuner, the Cyrus One integrated amplifier, and (stacked) the Cyrus Two integrated amp and Cyrus PSX power supply.

crossovers in small, two-way speakers that combine rather low efficiency with smooth midrange response, adequate bass extension, and precise imaging.

Tape Recording

The first magnetic tape recorder was the German Magnetophon, designed and built in 1935. It became a high-fidelity device with the addition of a.c. bias in 1942. The first tape for the new machine was made by Bayerische Anilin und Soda Fabrik, now known simply as BASF. Several early Magnetophons "liberated" from Germany after the war evolved into new American professional tape decks from Ampex and Scully. In Switzerland, around 1948, Willi Studer produced the first Revox, a machine whose successors, appearing under both the Revox and Studer brand names, have been for many years respected by engineers and widely used by both amateurs and professionals.

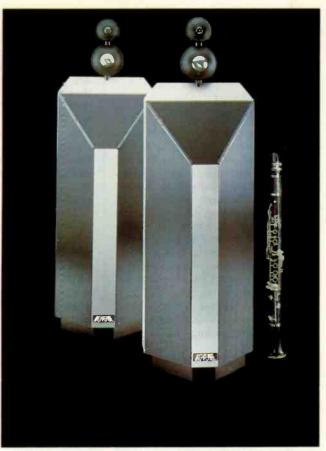
According to Reynaud Delapraz of Studer Revox, open-reel is still a viable medium in Europe: "Especially in Switzerland, people have bought open-reel machines, and they continue to update their systems with the latest new equipment. In the States we have 200 dealers, but in Switzerland there are something like 650 dealers for six million inhabitants."

In Norway the Tandberg company (also known for sophisticated amps, preamps, and tuners, as well as a new CD player) has produced a steady stream of new design ideas to improve tape performance. First came the cross-field design, in which an additional head aimed at the back side of the tape helped focus the magnetic field of the record head for extended high-frequency response and lower distortion. For cassette decks Tandberg produced the Dyneq (dynamic equalization) circuit, which improves high-frequency headroom and, by preventing tape saturation, minimizes intermodulation distortion in cassette recordings.

The Danish firm of Bang & Olufsen (B&O) created the HX Pro headroom-extension circuit, another method of enhancing high-frequency performance that is now becoming increasingly common in cassette decks. An earlier Dolby HX circuit had unexpected side effects, leading to the discovery that high audio frequencies act as a biasing signal when lower frequencies are being recorded. Using this effect,



The Magnasphere speakers from Magnat in West Germany have six 54-inch woofers, two spherical midrange drivers, and a spherical tweeter. The infinite-baffle systems are rated for a frequency response from 32 to 27,000 Hz ± 3 dB.



Digital video is on the horizon. While some European companies are introducing VCR's and TV sets that perform useful tricks such as picture-in-a-picture and perfect freeze-frame effects, other manufacturers are developing digital video processing circuits that enhance picture quality. The result is called EDTV, enhanced-definition TV.



A cutaway of the Matrix 2 from England's B&W Loudspeakers shows the extremely rigid, cellular honeycomb structure of its cross members. Matrix series speakers are designed for minimal, fast-decaying cabinet radiation to avoid coloring the drivers' output.





The English-made KEF 104.2 speaker, shown in a cutaway diagram above, has two 8-inch woofers that load a coupled cavity, two 4½-inch

midrange drivers, and a 1-inch tweeter. Frequency response is rated as within 2 dB from 55 to 20,000 Hz. An electronic circuit protects the system from overload damage.

B&O devised (and Dolby adopted) the HX Pro circuit, which gives IEC Type I (ferric, or normal) and Type II (CrO₂) tapes nearly the same useful high-frequency headroom as a Type IV (metal-particle) tape.

Looking Ahead

European designs will continue to play a major role during the months and years ahead, especially in the growth areas of digital audio and video. For example, a new Philips digital-to-analog converter (featuring 16-bit decoding with a fourtimes-oversampling digital filter) is likely to be adopted by many manufacturers of high-end audiophile CD players. Philips has also developed an audio microprocessor that can serve as the heart of an all-digital "preamp," accepting the direct digital bit stream from a CD player and providing many kinds of signal processing while the signal is still in the digital domain.

Meanwhile digital video is on the horizon. While some companies are introducing VCR's and TV sets that perform useful tricks such as picture-in-a-picture and perfect freezeframe effects, other manufacturers are developing digital video processing circuits that enhance picture quality. (Digital-processed video is called EDTV, enhanced-definition TV. It is an intermediate step between conventional TV standards and the cinemascope-like HDTV, high-definition TV, which is many years away because it will require new broadcast standards.) Much of this digital processing, even in sets bearing American or Japanese brand names, will be based on a set of digital video integrated circuits developed by ITT in Germany.

It appears that West Germany will also be the first country to provide digital radio via DBS (direct-broadcast satellite). One of five proposed DBS television channels is being reallocated for audio use and will carry up to sixteen digital stereo signals. Reception requires a compact 3-foot satellite dish and a new type of digital-broadcast tuner that will cost only slightly more than an FM tuner.

Perhaps the greatest difference between the European and American audio shopper is the greater intensity with which the European approaches the subject. There are audio fanatics in the U.S. as well, of course, but they are a smaller fraction of the whole. Celestion's Graham Bank says, "In Britain, audio is very much a hobby activity, like

collecting stamps or antique cars—something that people devote a great deal of time and intense interest to. In the old days, hobbyists experimented with drive units, cabinet construction, crossovers. Now that the speaker is sold as a finished item, what is left for them to fiddle with? The stand, the connecting cables, the turntable base, the cartridge/headshell interface, and so on. The more we refine the product so that hobbyists can't fiddle with it, the more they will fiddle with the ancillaries."

The devotion of European audiophiles shows in their hi-fi magazines. The most spectacular of these are the Italian monthlies, whose lavish color printing and exhaustive testing procedures are enough to make an American audiophile drool. Dedicated hobbyists also demand greater involvement from the people who sell equipment.

According to Reynaud Delapraz, "Dealers and salespeople are required by law to serve an apprenticeship and have some kind of diploma. You can't just be a hi-fi salesman because you couldn't find a job anywhere else. These people are supposed to know what they're talking about. The industry also spends a lot of money to train these people, so most of the products they sell they know well."

There are audiophiles behind the Iron Curtain too. Because of trade barriers and foreign-exchange currency limits, their access to both Western equipment and Japanese gear is restricted, so they have to rely to a considerable extent on home-brew products. This is fortunate for some Americans, however, because manufacturers in Hungary and the Soviet Union were much slower to switch from vacuum tubes to solid-state components. American audiophiles who prefer tube amplifiers are now turning to Hungarian-made tubes, since Western companies no longer make highquality tubes for audio use.

This shows, perhaps, how much dedicated audiophiles everywhere have in common. As Graham Bank said: "People genuinely want to get the best out of their systems. You can produce some quite dramatic improvements just by adjusting the speaker height and location. A little bit of time and effort can be very rewarding, and we in the industry have a duty to let people know that, just by trying a few simple things, they can get more out of any hi-fi system they've got."



Revox cassette transport turns pro.

For consistently superior results in home audio recording, you need a professional tape transport. So we put one in the Revox B215 cassette deck. Our company philosophy would allow nothing less.

Studer Revox of
Switzerland is the world's leading supplier of audio tape decks to recording and broadcast studios.
Every transport we build adheres to the same strictly professional design criteria.
The B215 is no exception.

- 1. A Die-Cast Aluminum Alloy Chassis—Stamped or rolled metal is not acceptable because it could warp or bend over time; also, it cannot be milled and drilled with the required precision. The B215 chassis reflects the same massive stability seen in every Studer Revox recorder right up through our \$70,000 24-track machines.
- 2. Direct Drive Motors—The only alternative is belts and gears, both of which degrade performance over time. To avoid such compromises, the B215—and only the B215—has four tape drive motors: two quartz-locked Hall-effect motors for the dual capstans, and two microprocessor-controlled DC spooling motors.

3. An Azimuth Stable Headblock—
This is difficult to achieve in the cassette format because the headblock must move in and out of the cassette shell.

Nearly all other decks use an inherently unstable "sled" mechanism. But the B215 uses a pivoting die-cast headblock mounted on precision bearings (.001 mm tolerance) to assure

the stability required for opti-

mum high frequency response.

4. Gentle, Safe Tape Handling—An on-board microprocessor (one of three) monitors all tape motion in the B215. Optical servos govern the spooling motors to give constant winding speed, controlled tape tension, and smooth tape wrap. The motors gently slow the tape just before the end to prevent tape-stretching

jerks. Tape damage of any kind is virtually impossible.

Such uncompromisingly professional transport design brings extraordinary performance to the home recordist: incredibly low wow-and-flutter, extended frequency response, and consistently repeatable results time after time, year after year.

For one astute listener's evaluation of the B215's sonic qualities, please note the review in Volume 8, #7 of Stereophile. Reprints are available on request to the address below.



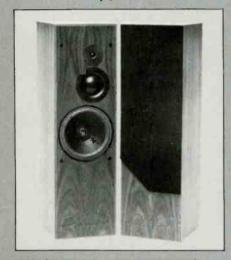
Studer Revox America, Inc., 1425 Elm Hill Pike, Nashville, TN 37210/(615) 254-5651





DALI: COMBINING ADVANCED TECHNOLOGY WITH TRADITIONAL EUROPEAN CRAFTMANSHIP

One of the more innovative speaker companies to appear in recent years, DALI—for Danish American Limited Incorporated—has a full line of Impressively engineered speaker systems. The company has recently filed for patents on several unique designs reflecting significant breakthroughs in a number of key performance areas.



INNOVATIVE ENGINEERING

Since the founding of the company, DALI engineers have been investigating the complex acoustic relationship between speaker systems and rooms. Intensive research has shown that reflected room sound is a frequently ignored, but critical factor in achieving realistic performance. And it is the view of Dali's engineers that intelligent speaker design involves proper control of reflected sound combined with a precisely defined directionality. A psychoacoustically plausible sound stage is not possible unless the firstarrival sounds and reflected sounds are maintained in proper perspective. As a result of this philosophy, Dali speaker systems are more "room friendly," are easier to place, and have a larger "sweet spot" with a wider and more accurate stereo imaging than conventional designs.

Another proprietary Dali development, dubbed VE2BR (Vibration Eliminating 2nd-order Butterworth Reflex), eliminates the usual cabinet panel vibrations caused by conventional woofer mountings. These vibrations are an unappreciated source of a variety of sonic colorations. DALI's configuration was described in the patent

abstract: "Two woofers are connected back to back, one on the front plate of the system and the other on an internal baffle board ... the back-to-back arrangement and mutually opposed woofers results in a non-vibrating unit." In addition to negating potentially destructive vibrations, the DALI VE2BR design also provides a very low system resonance, excellent transient response and low frequency efficiency, and a significant reduction in harmonic distortion.

A third, more recent DALI patent involves a double magnet, dual voice coil woofer. This design, called DMSLS (Dual Magnet Super Linear Stroke) provides an extended and linear woofer cone excursion which results in very low distortion at substantial low-frequency output levels.

DALI's advanced technology appears in the six models marketed in the United States: the bookshelf models DALI 2 and 3 and the floor standing monitor models DALI 4, 6, 7, and 8.



The DALI 7 is the first model to use a patented asymmetrical room-interface crossover technology, and will be available later this year. The DALI 40, also due this year, will incorporate the VE2BR Principle in what will be judged a world class speaker design. As befits their Danish origin, All DALI speakers are carefully assembled and finished in elegant, hand-rubbed natural walnut veneers.

In the past two years, engineering advances have earned DALI a reputation for being one of the world's most respected and innovative loudspeaker manufacturers. The company is currently represented in virtually every

major country and has received a series of excellent reviews in the audio press internationally.



INNOVATIVE MARKETING

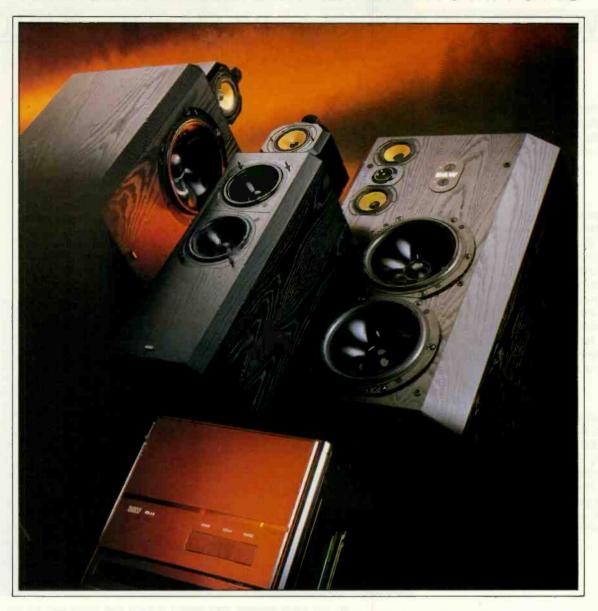
DALI's ongoing research has the dual goals of improving the quality of loudspeaker reproduction while lowering its cost to the consumer. This dedication to cost-effective quality has resulted in both a superb product line and an innovative marketing and distribution plan. DALI speakers are not currently available at stereo retailers; instead they are sold directly to the public on an individual purchase basis. All DALI speakers are offered on a 10day "satisfaction guaranteed or money back" basis. If you would like more information about our products and direct marketing policy, we encourage you to write or call:



DALI 20732 Soledad Street Unit J Canyon Country, CA 91351

Toll-free 1-800-251-DALI In California: 805-252-7203

THE 800 SERIES MASTER MONITORS



LISTEN AND YOU'LL SEE



801's of a Deutsche Grommephon digital recording session in the Kingsway Holl, Landon.



801's pictured here in the Decca digital suite, London.



801's in the celebrated EMI Abbey Rood studios, London.

Top-of-the-line models 801F, 802F, 808 and the new MPA810 power amplifier: at the fore-front of sound reproduction technology. Used by digital recording studios worldwide and soon, we hope, by you.

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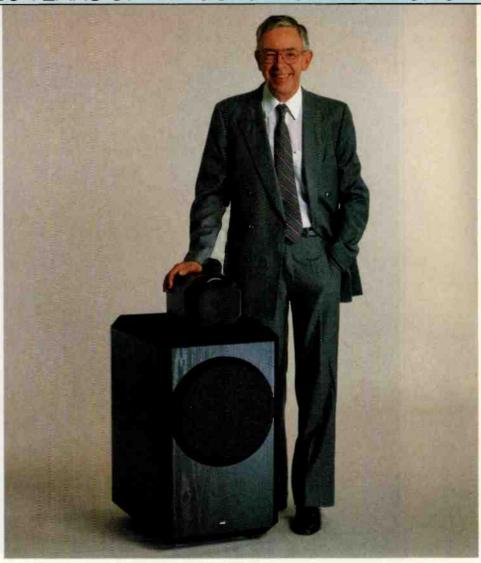
1966 BEW 1 1986

WCELEBRATES 20 YEARS OF THE QUEST FOR PERFECTION

The inspiration behind B&W was, and still is, that of John Bowers — creator, engineer, musiclover and perfectionist. B&W is a personal dream that became an internationally respected com-

Twice the winner of the Queen's Award to industry and designer of numerous award-winning and trend-setting loudspeaker models, B&W still remains committed to the goal which was the impetus for its founding: the most faithful re-creation of music possible. For while John Bowers and his B&W team enjoy the great respect of the audio industry, they have as many admirers and friends among the world's top professional musicians, conductors and recording engineers. That, perhaps better than any other accolade, attests to the quality of every B&W design.

Today the B&W sound quality is legendary, and extends from the professional monitor models 801F and 808 to a range of products to suit virtually every application. The affordable 100series of Digital Monitors, the Video Acoustical Professional Amplifiers, Monitors. loudspeakers and a complete range of Automobile loudspeakers, all reflecting the "Quest for Perfection" which motivated B&W's beginnings 20 years ago.



"My own critical standards when listening to music have always been exacting. have never expected those of B&W customers to be less so." John Bowers Founder and Managing Director, B&W Loudspeakers

The world's audio press tells the story:

Model P2 (1966) "... for this loudspeaker with its broad and balanced polar response, its linear and extended frequency response is approaching the ideal everyone is seeking perfection."

John Gilbert, Gramophone (U.K.)

Model 801 (1979) "In simplest possible terms, the 801 is among the handful of great loudspeakers available."

High Fidelity (U.S.A.)

Active 1 (1985)

Model DM6 (1975) "... the overall impression left after many weeks of listening is predominantly one of satisfying, untiring natural sound, without any distracting teature which could be termed a flaw."

Trevor Atwell, Hi-Fi News (U.K.)

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Model 808 (1984) "It is difficult to describe how one gets caught up in the music, how the climaxes of a Mahler symphony, for instance, afford an emotional impact that can truly be described as upliffing... There is no doubt that the B&W 808 is a major achievement in advanced

speaker design."

Bert Whyte, Audio (U.S.A.)

"The John Bowers Active I certainly measured like a fine speaker, and we are happy to report that it sounds as good as its measurements imply-beautifully balanced and uncolored... The bass output from the two 6-inch drivers... compares very well with the output from good 12-inch woofers in cabinets at least twice the size of the Active I."

Julian Hirsch, Stereo Review (U.S.A.)

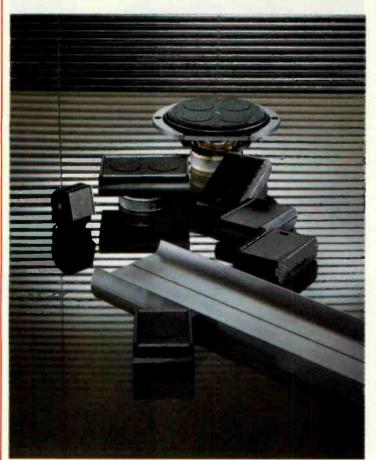
B&W Hi-Fi Leaves Home... And Takes to the Road

The beginning of this decade saw the logical extension of home hi-fi into the automobile, with sophisticated audiophiles seeking performance standards on a par with those of their high-end domestic systems.

B&W responded to the challenge in 1982 by introducing their LM1 series of Leisure Monitors. For many LM1 provided for the first time an opportunity to have quality hi-fi in the automobile.

The enthusiasm with which LM1 was received led to the infroduction of MASS — B&W's Modular Automobile Sound System — in 1985. Comprising 8 interlinking modules, MASS combines B&W's world-famous sound quality with system flexibility, high sensitivity and a wide range of installation options.

MASS provides a refined solution to the problems of critical in-car listening, maintaining the highest performance standards while overcoming installation limitations, off-axis listening positions and adverse climatic conditions. Such refinements as B&W's APOC (Audio Powered Overload Circuit) to protect the drive units and the unique dual-action swivel mount of the LT40 tweeter (based on the famous TXS26 high-frequency driver used in studio monitor 801F) are just some of the technological advances made with MASS.



Eight associated modules form MASS



Leisure Monitor LM1

The Kevlar Cone

Kevlar — DuPont's aromatic polyamide fibre — is vastly superior to conventional loudspeaker materials and particularly suited to automobile loudspeaker applications. Kevlar's combination of high stiffness and low mass had proved its sonic superiority through use in the all-important midrange driver of the 801F. Its extremely low mass is particularly critical for automobile applications where high sensitivity is an important criterion given the lower power output of most car audio amplifiers.

Easily capable of withstanding temperature extremes and high humidity, Kevlar will not be affected by the adverse conditions inherent in the automobile environment. Initially developed for bullet-proof vests Kevlar is used today for racing cars, yachts, and many other high-performance products where the weight-tostrength ratio is critical, such as the Porsche 959 which must be a prime example of today's technology ahead of its time.



Kevlar cone & Porsche 959

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1966 MAN BAW MM 1986

Two Decades of Creative Innovation

In his heart John Bowers is an engineer and designer, and his engineering creativity has directed B&W's policy from the very beginnings of the Company. This dedication has made B&W one of the most research-oriented companies in the audio industry, and their Steyning Research Establishment is among the most advanced acoustical laboratories in Europe.



Steyning Research Establishment

Although equipped with some of the most modern and sophisticated tools available, it is the Steyning Research Establishment's engineering team which is B&W's greatest asset. Their creativity over the last twenty years has pioneered a number of industry milestones:

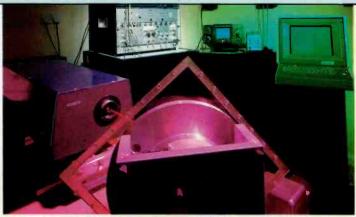
- a calibration certificate included with every production loudspeaker
- digital testing for quality control in production
- incorporation of electronic overload protection circuits
- first to use Kevlar for loudspeaker cone construction
- first in Europe with a linear-phase loudspeaker DM6
- first with computer optimisation for crossover design
- first to use composite enclosure techniques employing Fibrecrete bonded to structural foam
- first to employ laser interferometry to study the vibrational behaviour of loudspeaker drivers.

... and in 1986...

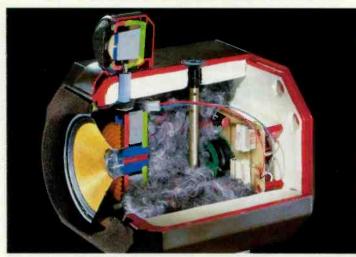
MATRIX — a significant advance in loudspeaker enclosure technology.

It is a source of considerable pride to everyone at B&W that every model in the range employs only components of B&W's own design and manufacture. All drivers and crossover networks are manufactured at B&W's facilities in Worthing, Sussex, under the most stringent quality control systems.

Styling has always been recognised as an important feature of B&W loudspeakers and Kenneth Grange of Pentagram Design has consistently created enclosure designs which complement the technical excellence of the loudspeakers.



Dr. Glyn Adams, head of B&W's research department, pioneered a technique for monitoring the vibrational behaviour of loudspeakers using lasers.



The Fibrecrete lining of its midrange head assembly is one of the important reasons for B&W 801F's superior performance.



B&W's automated tweeter assembly. Technology in the service of music.

CIRCLE NO. 59 ON READER SERVICE CARD

1966 MAN BRWING



MATRIX — The Modern Art of Sound

In loudspeaker design, as in other technologies, the frontiers of what can be accomplished are pushed back gradually in an evolutionary process of development. Occasionally, however, a breakthrough of major proportions is made. B&W MATRIX* is just such a breakthrough.

Whilst steady progress has been made in the development of new and better drive units, until recent years little attention has been paid to the actual enclosure housing these drive units. Because of its importance to loudspeaker performance, B&W instigated a research programme on enclosure design three years ago, embracing a wide range of materials including the socalled Aerospace materials. "Sandwich" construction and even concrete. Despite the extravagant claims made for these materials, B&W's research showed that in some respects they were inferior to a conventional enclosure. B&W therefore invented MATRIX.

The MATRIX enclosure comprises an inner honeycomb structure bonded to the outer skin of the cabinet and filled with sound absorbing foam. The enormous stiffening provided by this structure virtually eliminates enclosure radiation at low and mid frequencies, with the additional damping providing a similar effect at high frequencies. The cellular foam configuration almost completely absorbs rear radiation by the driver.

Of equal importance is the "Time History" — the time required for the sound to decay. MATRIX scores equally well on this count, mini-

mizing "hang-over" inherent in less sophisticated loudspeaker enclosures.

The B&W MATRIX series of Digital Monitors has been designed for the age of the compact disc, with all the additional requirements this source material places on the loudspeaker system: increased dynamic range, increased transient information and a lower noise floor.

Having designed a near-perfect enclosure B&W developed totally new and improved components to complement their invention. Homopolymer Polypropylene cones (almost twice as stiff as Copolymer Polypropylene used by other manufacturers), a totally new Ferrofluid cooled tweeter giving 8dB increased dynamic headroom at high frequencies and a crossover network providing a new standard for low distortion and resistive amplifier loading.

B&W have published a complete "Design Story" on the MATRIX series of Digital Monitors, including research results from the three-year design programme. Write to us for your copy, or visit your local authorized B&W dealer.

*B&W MATRIX is a trademark of B&W Loudspeakers Ltd.

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1966 MAN BAW MAN 1986

MILESTONES



1967 P2H "Approaching the ideal everyone is seeking perfection." JOHN GILBERT, GRAMOPHONE



1970 DM70 When launched Funk-Technik (Germany) said:
"... a milestone of development for the next decade."
Time proved them correct.



1972 DM4 Increased B&W's export tenfold in five years winning a second Queen's Award.





1983 DMM0 Pop, jazz, rock, classical — total spectrum capability from this popular and 'affordable' Digital Monitor.



1979 801 B&W's first professional monitor loudspeaker. Now selected worldwide as classical music monitor by all major recording labels.







0

1984 808 Reproduction to full reference standards perfection to 120dB.



1986 MATRIX This unique system concept incorporates a revolutionary enclosure design. Find out more from your B&W stockist.

Two decades of creative innovation, of setting the standards in advanced loudspeaker design. Constantly pushing at the frontiers of sound technology. The B&W quest for perfection continues.

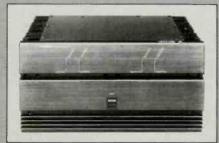
20 Years Of Sound Technology

ANGLO AMERICAN AUDIO, P.O. BOX 653, BUFFALO, NY 14240 416-297-0595



TANDBERG: A UNIQUELY NORWEGIAN APPROACH TO AUDIO DESIGN

Tandberg occupies a special position in the high-fidelity industry-not only because of our more than 50-year history as a producer of quality audic and electronics products, but also for our unique approach to design and manufacture. In our design concepts circuitry, and particularly in our attention to the nuances of sonic performance, Tandberg defers to none of the highend "esoteric" manufacturers. Yet, as a major European electronics company, Tandberg is able to marshal technical resources and manufacturing skills that far exceed those available conventional limited-production high-end manufacturers.



The TPA 3016A Amplifier.

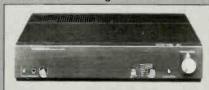
FEEDBACK NEGATIVES

The professionally critical listeners on Tandberg's engineering staff have been researching "esoteric" distortion problems since the late 70's. Early on it became clear that further reduction of conventional distortions was not the answer to improved sound. And, in fact, one universally used distortion-reducing design technique—negative feedback—actually proved to be a major trouble source.

Negative feedback is supposed to cancel distortion as it occurs by feeding an out-of-phase version of the distorted signal back on itself. Unfortunately, when an amplifier's slew rate is inadequate, the fed-back signal isn't returned to the earlier stages quickly enough to cope with transient signals. The distortion gets through, intensified-rather than cancelled-by the delayed feedback signal. Once Tandberg's engineers realized that negative feedback was a problem rather than a solution, they sought ways to reduce feedback to insignificant levels. Their ultimate solution was the creation of zero feedback design topologies.

It is both difficult and expensive to

make do without the "whitewash" cover-up effects of feedback. When feedback is no longer present to mask



The TCA 3018A Preamplifier.

the sonic inadequacies of standard parts, all resistors and capacitors must be specifically chosen for their sonic properties and discrete transistors must be used rather than ICs. And most important, all signal-carrying circuits must be designed to operate with exceptional linearity.

CAPACITORS AND SIGNAL PURITY

Research has shown that the electrolytic capacitors used by most manufacturers for signal transfer between audio stages typically exhibit 5 percent or more dielectric absorption. This refers to the tendency of the capacitors to "hang on" to each passing signal and superimpose its characteristics on subsequent signals. This results in a subtle blurring and loss of detail. Tandberg's solution to the problem was to replace all the capacitors with the more costly polypropylene and polystyrene types. Dielectric absorption was reduced to a mere 0.05%, and the problem disappeared.

OUTPUT CURRENT CAPABILITY

Tandberg used Metal Oxide Semiconductor Field Effect Transistor output devices instead of the more common and less costly bipolar types. MOS-FETs are faster, more stable, and eliminate the need for signal degrading current-limiting protection circuits. Although a number of competent amplifiers employ MOSFET output devices, the constant-impedance, highcurrent driver stages used in Tandberg's 3000A series of power amplifiers are the only ones configured specifically to fully realize the special qualities of MOSFETs. The inherent linearity of the MOSFET devices is further enhanced by a sophisticated voltage-comparator circuit that linearizes the output stages without the use of feedback. The absence of feedback is partly responsible for the absolute stability of the 3000A series amplifiers with any type of loudspeaker load.

The high current capability of the Tandberg output stages further ensures that the performance potential of the amplifiers will be maintained, however difficult the loading presented by the speaker systems. A typical "8-ohm" speaker can fall as low as 2 ohms under certain signal conditions. Unless an amplifier has sufficlent current reserves to cope with such low impedances, it clips and generates transient distortions. Tandberg was one of the first manufacturers to understand the problem and eliminate it by designing high current output stages. The high current output is supported by tightly regulated power supplies using massive toroidal transformers and very large filter/storage capacitors.

FINAL WORDS

Although attention was focused on the electrical performance of the 3000A series, physical design niceties were not neglected. The extruded solid aluminum slim line chassis (with integral heat sinks, when required) are all sized to stack neatly with other Tandberg components. Totally at home in any decor, each product in the 3000A series is designed to appeal to the discriminating ear and eye, while maintaining the Tandberg reputation for ease of use.

We have touched only on the high points of Tandberg's purist approach to audio design. Other examples could be cited of Tandberg's research into the little-understood sonic problems of amplifiers, FM tuners, and tape recorders. But aside from the specifics of how we achieved our goals, we hope to have made it clear that Tandberg has taken—and will continue to take—whatever steps are necessary to ensure that the products bearing the Tandberg name are technically and sonically second to none.

TANDBERG Audio Components for the Connoisseur





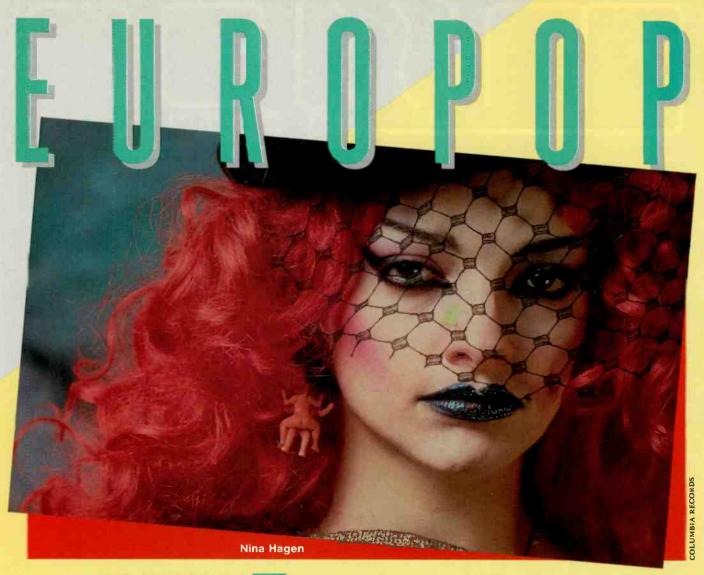
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THE EUROPEAN INVASION OF THE EIGHTIES MAY SIGNAL THE MOST FUNDAMENTAL CHANGE IN POP MUSIC IN DECADES.

BY STEVE SIMELS

UROPE, over the years, has given so much to American culture-the Magna Carta, the theories of Marx and Freud, Anita Ekberg, to name only a few examples-that it comes as something of a surprise when you realize the paucity of European contributions to pop music in the rock-and-roll era. There was, of course, the original British Invasion of 1964-1965, but considering how long it took for the British to join the Common Market, it could be argued that they aren't really Europeans. Until fairly recently, you were about as likely to find a European act on the American pop charts as you were to meet Jerry Falwell at a massage parlor.

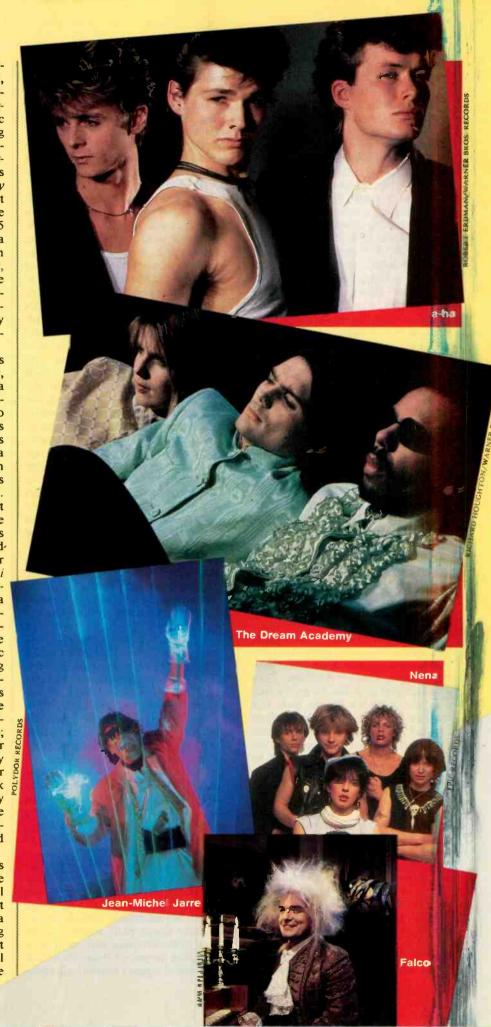
What caused this form of what the French have called American Cultural Imperialism no one can say for sure. The language barrier probably had a lot to do with it, as anyone who has ever giggled at the bizarrely accented English on an

ABBA record can attest. That's the kind of handicap that gets even a first-rate hit-record-making machine typed primarily as a novelty act. But today, for whatever reasons-the recent strength of the American dollar, a terrorist-inspired climate of international cooperation, the fact that most successful American rockers are nearing the mandatory retirement ageall this has changed. Suddenly, Americans are buying records by Europeans in significant numbers.

There are, of course, historical precedents behind this latest threat to our trade deficit. After the success of the Beatles, kids all over Europe formed garage-rock bands just as their American cousins did. Some even sold a few records in their homelands, although they were sometimes pretty ridiculous by American or British standards (you haven't lived until you've heard Swedish covers of the Rolling Stones singing Chuck Berry). And throughout the Sixties, an occasional Eurohit did sneak into the States. There were big sellers by the German bandleader Burt Kaempfert. the man who first recorded the Beatles, who scored with his Wonderland by Night, and the Teutonic pianist Horst Jankowski, whose big hit Ein Schwarzvald Fahrt was hastily retitled A Walk in the Black Forest for U.S. consumption. There was Sweden's Bent Fabric and his Allev Cat, a song that became a staple at weddings and Bar Mitzvahs. There was Spain's Los Bravos, whose 1965 Black Is Black got mistaken for a Gene Pitney out-take, and from France there was Paul Mauriat, whose treacly Love Is Blue was once actually covered by Jeff Beck (perhaps laboring under the misapprehension that it had been penned by an aging sharecropper from the Mississippi Delta).

In the Seventies, the Europeans began to get a little more feisty, commercially speaking. Disco had a lot to do with that, since synthesizers and chanted lyrics tended to travel better than electric guitars and Mick Jagger inflections (it was no accident that disco queen Donna Summer was recorded in Munich by Giorgio Moroder). But there was some traditional pop-rock as well. There was a mini Dutch invasion at the beginning of the decade—the Shocking Blue, whose Venus was one of the best Pete Townshendsteals of all time; the George Baker Selection, whose Ma belle ami wasn't; and Focus, whose Hocus Pocus did not, fortunately, kick off a world-wide craze for yodeling. Later, there was even the Dutch hardrock band Golden Earring, whose Radar Love was one of the classic car-radio records. The band hung around into the MTV era. Elsewhere on the Continent, there was ubiquitous ABBA, whose Waterloo was the greatest Phil Spector record Phil Spector never made; a lot of one-shot wonders like Silver Convention and their mercifully forgotten Fly Robin Fly; the dour Germanic electro-rock of Kraftwerk (Autobahn), which was enormously influential on both disco and the more recent New Wave; and Belgian punk crooner Plastic Bertrand (Ca plane pour moi).

Still, it wasn't until the Eighties that Europeans began to penetrate the American market with any real frequency. Today, surprising as it may be, it is almost cool to be a European act, and we are living through a European Invasion that may signal the most fundamental change in pop in decades—the



emergence of a truly global music. Our musico-geographical survey of European acts of the Eighties is not meant to define the musical scenes in each of the countries involved, but these acts have achieved high visibility in the U.S.

In the wake of the Kurt Waldheim flack, it is perhaps appropriate that we note the emergence of a far less controversial figure, the first Austrian rock star to affect the wallets of American record buyers. Falco, né Hans Hoelcel, is a twentynine-year-old Viennese-born fashion plate who clearly spent a great deal of his formative years listening to David Bowie and observing Bryan Ferry (although, to his credit, he does seem to have more of a sense of humor than either of them). An extremely ambitious young man, Falco made his first splash with Der Kommissar, but he really clicked this year with Rock Me Amadeus, an amusing blend of Wagnerian overkill and American rap inspired, of course, by the Milos Forman film.

"I view myself as a European person, and Wolfgang is such a part of Europe," Falco has said. "I'm convinced that if Mozart were alive today, he'd be a classical rock-androll star."

Basically, Falco is a product of the video age. He does not tour in this country and does not plan to. Instead, he records slick MTV clips, like the recent *Vienna Calling*, that make the most of his lounge-lizard good looks and Continental charm.

From Norway, meanwhile, comes a-ha, a bunch of highly photogenic youngsters who have done more for the Nordic blonde look than anybody since Ursula Andress. Let's face it: these guys are so pretty that they make Duran Duran look like the Beast Men in the original *Island of Lost Souls*, and if that suggests that they may become the Eighties equivalent of the teen idols of an earlier era (Frankie Avalon, Fabian), you'll get no argument from this quarter.

Tellingly, a-ha had never played in public as a band until their appearance on the most recent Grammy Awards telecast—where, to be fair, they ran through their big hit, Take On Me, with a reasonable degree of panache. Still, though the song itself, with its instantly addictive falsetto chorus, is an attractive bit of pop fluff, it is doubtful it would have dented the charts without the help of a brilliant video in which the band members popped in

and out of an animated cartoon like some mod update of Buster Keaton's Sherlock Jr. And since the rest of the songs on the group's "Running High and Low" album were distinctly unmemorable in comparison, you wonder about their longevity. Don't worry. If music fails them, they can always work as models for GQ.

Say what you will about England, but it has produced more rock bands per square mile than any other former world power. Of course, perhaps as a result, the English music scene is dominated by a kind of Flavor of the Month mindset, but at least there's always something happening over there. In that light it's instructive to compare two recent, critically acclaimed English imports that couldn't be more dissimilar the Dream Academy and the Pogues. The Academy, for all their Eighties packaging (as Warren Zevon put it, their hair is perfect), are the apotheosis of the Sixties production style, a Sgt. Pepper wet dream. Their sound is unbelievably lush, their melodies incredibly and appropriately dreamy, their music one of the purest studio creations in recent memory. The band's roots may be folkish, as in their hit Life in a Northern Town, with its echoes of the gentle ruralisms of Nick Drake (a legendary English songwriter who committed suicide in the mid-Seventies), but their execution is the last word in high-gloss Moderne. Paul Simon, of all people, is reputed to have given them studio tips.

Meanwhile, the Pogues are the Academy's polar antithesis. punk-folk group, for want of a better word, they're a sort of cross between a bunch of London subway buskers and the Ramones. Their album "Rum Sodomy and the Lash," produced by Elvis Costello with his customary disdain for the slick, is political, angry, and obviously rooted in the English folk tradition that gave the world those two great songwriters Trad. and Anon., but with an Eighties edge that ensures them an audience broader than the purist folkie set. It will be very interesting to see how—or if—both of these bands develop.

From Germany, land of Schopenhauer, sauerbraten, and Max Schmeling, let us now praise two pop stars on the distaff side. Nina Hagen, whose credits include an appearance (apparently a first) on the cover of the German edition of *Mad* magazine, is one of those theatrical New Wave singers whose hair styles

are at least as influential as their vocal styles. An East German who fled to the West, she is a quintessential Teutonic punk. Her records up until now have been loud, vaguely political, and almost impossible to listen to. Still, she regularly sells out large halls in major American cities, and a hit record seems inevitable given the American public's documented appetite for hectoring harpies (cf. the early Patti Smith).

Far more accessible is another German girl act, the oh-so-cute New Wavers known as Nena. Nena herself, a young woman with the elfin good looks of MTV vee-jay Martha Quinn, sings like the proverbial bird, but in her own way she's as politically committed as Ms. Hagen. In fact, her recent hit 99 Luftballons was a trenchant little anti-war statement, although its effectiveness may have been blunted for American audiences because of her German accent. Oh, well. Actually, at heart both of these women make fairly straightforward rock-and-roll, unlike the rest of the artists we're discussing here, which may or may not be significant.

The French, alas, have what might be described as a love/hate relationship with American culture (believe it or not, the French government has been trying to make use of English words like "bluejeans" illegal). Perhaps because of this ambivalence, they have never produced any rock-and-roll of note, but not for lack of trying, as anyone who remembers the premier French punk band, the unfortunately named Stinky Toys, will agree. However, the French have an undeniable knack for turning out middle-of-the-road pop acts like Sylvie Vartan and Françoise Hardy, and right now the hottest French musical export is an impeccable middle-of-the-roader, Jean-Michel Jarre. A keyboard wizard in the tradition of Vangelis or Rick Wakeman, Jarre is the son of the great film composer Maurice Jarre, and, not surprisingly, his multitracked synthesizer musings tend to sound like scores to movies nobody has made yet. Currently kicking up some dust with Rendez-vous, a tribute to the late Challenger astronauts that's one of the rare instrumentals to have cracked MTV, Jarre makes music that is basically cornball despite its high-tech trappings, but it's also as French as runny brie, and a lot less fattening. It may not be rock-and-roll, but we like it anyway. Vraiment.

W TO GET STERED TV AT HOME



BY DAWN GORDON

HE first American stereo television broadcast occurred on July 26, 1984. On that day The Tonight Show aired in stereo, and things haven't been quite the same since. Well over three hundred stations are currently equipped for Multichannel Television Sound (MTS) broadcasts, and the three major networks are providing a total of thirty hours per week of regularly scheduled stereo programming to their local affiliated stations.

But how do you receive stereo programming in your home if you own a mono TV set or have a satellite dish? Or if you are connected to a cable system that has yet to offer stereo decoding equipment to its subscribers? The solutions are easy enough to implement, and although you may have to spend some extra money, stereo recep-

tion is as exciting an innovation as color TV was back in the Sixties.

If you've replaced your mono TV set with a brand new stereo model, you can receive stereo broadcasts now. Just like cable-ready sets that receive mid- and superband cable channels, stereo-ready televisions (and VCR's) contain the circuitry necessary for decoding the stereo and secondary audio program (SAP) signals. Most stereo TV's are high-end 1985 or 1986 models that contain not only stereo decoding circuitry but better than average speaker systems as well. And audiophiles will appreciate another feature of many of these sets: audio outputs for connection to a stereo system, allowing the TV sound to be played through high-quality home speakers. In some cases, stereo TV's also incorporate built-in amplifiers (usually around 5 to 15 watts per



Sansui's S-XV1000 audio/video receiver provides connections for up to three VCR's, a fader control, and a joystick-driven color-correction system. Rated power is 80 watts into 8 ohms with less than 0.01 percent total harmonic distortion.

Polk Audio's Video Sound speakers, the VS-25, VS-19, and VS-12, are designed to be used with a TV set or video monitor. The speakers have a special magnetic structure to eliminate interference with the picture screen.



channel) so that you can connect small or highly efficient larger external speakers to them directly.

Stereo-Capable

If you purchased a top-of-the-line 1984, 1985, or 1986 model TV from a major manufacturer, there is a very good chance that it is *stereocapable*. What this means is that the set has a special multiplex (MPX) output designed to accept an external MTS stereo decoder.

MTS decoders for stereo-capable TV's are available from many different manufacturers, but, as with other specialty products, it may be best to purchase a decoder from the same manufacturer that produced your TV. Although many decoders are universal by design, some manufacturers use different types of MPX outputs, so compatibility could be a problem if you decided to mix and match. Because these decoders lack their own built-in tuners and rely on the TV's own tuner, they are relatively inexpensive and easy to use.

Even a stereo VCR needs a decoder for MTS. Without the decoder you will be recording off the air in mono. While many stereo VCR's today have built-in MTS decoders, others have only an MPX terminal for connecting an outboard decoder, and still others have neither a decoder nor an MPX jack.

But suppose you like the TV and VCR you already own, and neither one has a built-in MTS decoder. If you don't want to spend the money for two MTS decoders (one for the TV and one for the VCR), there's a way to get by with just one-if your VCR is a stereo model with an MPX jack. Connect an outboard MTS decoder to your VCR and use the VCR's tuner instead of the one built into your TV set. Since the VCR is decoding the signal, simply connect a pair of audio cables to the VCR's audio output and the other end to your stereo system or the stereo video input on your TV set or monitor. You will then be able to receive MTS broadcasts, but you will have to use your VCR to change channels, and you will not be able to listen to one channel in stereo while recording another.

Cable

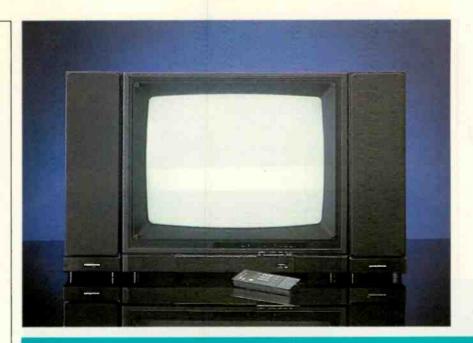
Even when you have stereo-ready or stereo-capable equipment, if you are a cable subscriber you may not be able to receive MTS because of the kind of converter box you have or the way the cable company handles the signals it transmits.

A quick look at the way MTS is transmitted should make the situation clearer. The audio part of a TV broadcast begins at a network's main transmitter, which sends either of two pairs of audio signalsdiscrete stereo channels (left and right) or identical mono channelsto a satellite. The satellite rebroadcasts these signals, and they are pulled in by local affiliate stations. The local station sends the audio signals it receives from the satellite through a switcher that determines whether the program is mono or stereo. If it's mono, the audio signal is sent out to your home without further modification. If it's stereo and the local station has an MTS encoder, the signals are passed through the encoder before being sent out over the air. If you have a decoder built into or attached to your set, you can receive the audio in stereo.

ABLE companies pick up their nonpremium channels the same way you do at home—from the air. They can pass along MTS-encoded audio signals for you to decode at home, or they can kill the stereo audio by simply fil-

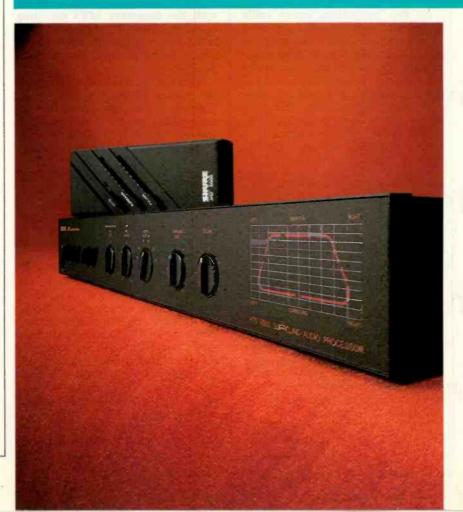
tering it out or by sending it through older transmission equipment that cancels the MTS encoding during a demodulation/remodulation process. Moreover, if you're among the 15 percent of cable subscribers who have the old-style baseband converters instead of the newer r.f.-type converters; the MTS signal will be cut off before it reaches your decoder even if the cable company has passed it along.

The situation is even more complicated when it comes to premium cable channels such as MTV or HBO, the ones that don't originate in a local broadcast. In these cases it is the cable company that would have to encode the audio signal for MTS in order for you to receive it in stereo (with an appropriately equipped TV or VCR). Until very recently, the equipment for MTS encoding was too expensive for cable use, since a separate encoder would be needed for each premium channel (which is, in effect, a separate "station"). The latest word is that a new type of encoder will be available very soon that will cost



The Proton 625 monitor/receiver has a 25-inch screen, three video and three audio inputs and outputs, MTS/SAP capability, and remote control. Its built-in power amplifier's frequency response is rated as 20 to 30,000 Hz ±3 dB.

Shure's HTS 5000 Surround Audio Processor has five speaker cutputs and three audio modes: Dolby Surround, stereo ambience recovery, and stereo synthesis for mono sound. A remote unit controls volume, surround-sound level, and system mute.





The Fosgate 3601 Space Matrix processor features two built-in 40-watt rear-channel amplifiers, line outputs for external amplification, and five audio modes: stereo, mono, Dolby Surround, surround, and panorama. A remote control is optional.

Sony's new ST-7TV has both MTS and SAP decoding and a built-in tuner for accessing up to 181 broadcast and cable channels. Other features include separate A and B antenna inputs, audio and video outputs, and optional remote control.

only about \$2,000 per channel, so it is likely that most cable companies will eventually offer MTS service.

In the meantime, some cable companies have provided a temporary, partial solution by feeding the stereo audio portions of their transmissions on the FM band. Subscribers can receive simulcast stereo audio by connecting a cable to their FM tuners. Obviously, this is a stopgap procedure, but cable companies make a lot of money with it from installation fees and monthly "stereo" charges for this service.

Adapting Mono Equipment

If you belong to the majority in this country, you do not have a stereo-ready or stereo-capable TV or VCR. Until you trade up to stereo/ MTS equipment, or until your cable company modifies its equipment to let you receive the MTS signals unaltered, what can you do? Fortunately, audio/video manufacturers have solved the problems of mono cable systems and mono TV sets and VCR's by offering numerous external MTS decoders with built-in tuners. Basically, all you have to do is to attach one of these to your stereo audio system and stereo TV broadcasts are yours.

This type of MTS decoder differs from the kind that connects to an

existing MPX jack on a stereo-capable TV or VCR. Essentially, it is a separate, audio-only receiver along with the necessary MTS decoding circuitry. Most of these units require you to select channels twice, once on the TV and then on the decoder.

If you don't have cable, connecting such a decoder is fairly easy. Unhook the antenna cable that already feeds your TV and attach a two-way signal splitter to the end. Connect coaxial cable to both outputs on the splitter, then run one cable to your TV and the other to the MTS decoder. For audio output you have the choice of feeding the stereo signals from the decoder to your stereo system or, if the decoder has built-in amplifiers, to a pair of external speakers.

If you do have cable, with or without a stereo-ready TV or VCR, the first thing you will need is a good set of rabbit ears or any other decent TV antenna. By connecting the antenna to the MTS decoder's antenna input, you are taking the broadcast MTS-encoded audio signal and feeding it into the decoder. The video portion of the program is supplied as usual by your cable company hookup.

One example of a good external MTS decoder for use with mono

video equipment is Sony's ST-7TV, a CATV/MTS decoder with optional remote control (\$300). The ST-7TV can receive the audio from a total of 181 channels, has separate A and B antenna inputs and audio/video outputs, and can decode both stereo sound and SAP programs.

Another example is the Pioneer VZ-100 (\$150), which decodes stereo audio and SAP signals from VHF and UHF channels. Its MTS circuitry features automatic stereo/mono switching and the ability to receive stereo and SAP transmissions simultaneously. There are twelve presets for TV channels and twenty-four for AM/FM stations.

If you want the most innovative MTS decoder available, however, take a look at the Recoton V622 (\$149.95). This unit, also called F.R.E.D. (Friendly Recoton Entertainment Decoder), does not require the user to play with two channel controls. All you do is change the channel on your TV and the V622 will select the matching audio channel automatically thanks to an r.f. probe that attaches to the TV set. The r.f. signal picked up by the probe contains the MTS information. The V622 may not work with TV sets connected to cable systems that are not encoding the MTS signal. With those cable systems that are just supplying premium channels such as HBO, however, you can use the V622 for stereo reception of normal broadcast channels and the cable box for the premium channels by using an outboard A/B switch to select one or the other reception mode.



UT the Recoton V622 has numerous other features that set it apart from the crowd. Instead of the usual 25 to 30 dB of stereo channel separation, the V622 has a separation spec of 40 dB! It has two sets of audio output jacks.

The second set is for use with a stereo VCR, so that you can listen to one channel and record another simultaneously without a separate decoder for the VCR. The V622 also includes a stereo synthesizer that automatically engages for mono programming, an ambience enhancement circuit, DNR (Dynamic Noise Reduction) for mono material, and an MPX input for use with TV's and VCR's that have an MPX output jack. All the V622 lacks is SAP capability.

Due out by the time you read this will be Recoton's new V624 (\$199.95), which has all of the features of the V622 and also a 15watt-per-channel amplifier, separate bass, treble, balance, and volume controls, and a Channel 3/4 loopthrough input for easier connection to cable boxes. (See test report in this issue.)

Simulated Stereo

If the stations in your area are not yet transmitting in stereo, you're temporarily out of luck. An inexpensive device called a stereo synthesizer, however, will produce a simulation of stereo sound for a very nice effect. Many MTS decoders incorporate stereo synthesizers for mono programming, and a number of audio/video receivers such as the Yamaha R-9 also include it. It may be pseudo-stereo, but for many people it's significantly better than listening in mono.

Satellite Reception

Earth-station owners can get the best stereo reception of all, because the satellite dish receives the stereo audio signals in the same form they are sent to a local TV station. If you have an earth station, you will need a stereo satellite receiver to receive the incoming stereo feed. Because the MTS encoding has not yet been done, however, you cannot send the output of the satellite receiver to the antenna input of a stereo-ready TV set or VCR and get stereo. The pilot frequency that the MTS decoder looks for is simply not there. What you have to do is to connect a pair of audio cables to the stereo outputs of the satellite receiver and attach the other end to the audio inputs on your TV or music system.

Getting the Best Sound

Although stereo TV broadcasts are limited to a top of 15 kHz, you can still achieve sonic performance similar to that from your FM tuner. One way to do it is to purchase speakers specially designed for use within close range (2 feet or less) of a video monitor/receiver. These speakers are magnetically shielded because magnetic interference from ordinary speakers placed very close to a video screen can cause color interference.

Probably the best approach is to connect your MTS decoder to your music system. Your high-fidelity speakers will deliver the best video



sound as well. All you have to do is to connect the audio outputs of your stereo-ready TV or VCR or MTS decoder to the auxiliary or tape inputs on your audio receiver or integrated amplifier.

If you are passing the MTS signal through your stereo system, it's important to have your speakers flanking the TV screen. If the image is coming from in front of you and the sound from speakers on your right, it won't seem natural. And make sure that the speakers are no more than 8 feet apart or you will lose the center of the stereo image. If you cannot place your speakers closer together, it may help to turn the volume up on the TV to fill the "hole" created in the center of the listening

Integrating Audio and Video

Since the introduction of stereo VCR's, LaserDisc players, and MTS broadcasts, manufacturers have developed receivers designed to unify audio and video. Normally these units do not include video tuners but do handle the audio from video sources. Companies such as Sony, JVC, Yamaha, Sansui, Kenwood, Panasonic, and Pioneer offer audio/ video receivers with a variety of facilities for video switching, dubbing, and signal processing.

One of the more elaborate of these a/v receivers is the Sansui SX-V1000 (\$599), which features a built-in rear-channel amplifier and delay system for realistic theater or hall ambience, a special simulcast circuit for combining audio from the FM tuner with video from any of three different sources and recording it on a VCR, dubbing connections for three VCR's or two VCR's and a videodisc player, and separate outputs for a video monitor/receiver and a standard TV. It even has a front-panel joystick controller for color correction, and there's a built-in fader for semiprofessional video editing. Remote control is standard.

These days almost everything

comes with infrared remote con-TV's, VCR's, videodisc players, CD players, and even audio receivers. But in their efforts to free us from the tangle of wires that go with any complicated system, manufacturers have cluttered our coffee tables with little hand-held control devices.

One way around this problem is the total audio/video system from a single manufacturer operated by a single remote control. Pioneer, Sony, JVC, and RCA are among the companies offering such systems. But for people who would rather select their components from various manufacturers, there, are other ways. Magnavox and Sylvania are now offering a "universal" video remote control with many of their TV's that is preprogrammed to work with VCR's from twenty-nine different manufacturers, and one version even controls cable boxes. General Electric's Control Central (\$149.95) can "learn" the codes used by the remote controls for up to four different components, such as a VCR, a TV, a CD player, and an audio receiver, so you only have to use one hand-held remote for all of them. It's definitely a convenience worth looking into.

INALLY, if you want the latest offspring from the marriage of audio and video you can buy a surround-sound decoder to provide the ultimate in theater-type sound. You will also need a separate pair of rear speakers, and

in some cases a rear amplifier, but you'll be able to experience spaceships and planes flying overhead or the sound of wind from behind your back. Many stereo videotapes and videodiscs contain surround-sound information, and even stereo TV broadcasts are beginning to offer it as well. The decoders range in price from \$150 to \$600, and they're made by such companies as Sony, Pioneer, NEC, Sansui, Shure, Surround Sound, and Fosgate.

After nearly five years of waiting for the bureaucratic red tape to clear, MTS broadcasts are finally here. It may take the various cable companies another five years to catch up and offer stereo transmissions, but you don't have to wait to receive many stereo programs in your home. So the next time you enter the theater, it could just be in your own living room.

THE CARE AND STORAGE OF

Tips on how to give your tapes a longer, better life

by Larry Klein

HETHER your videocassette collection consists of old movies, Star Trek episodes, or a complete documentation of your child's early years, there are certain sensible steps you can take to preserve your cherished recordings.

The earliest video recordings were made about twenty-five years ago on 2-inch-wide tape. Since the picture and sound seem to have suffered no detectable changes through the years, experts believe that videotape longevity is such that your children's children should be able to enjoy the videocassettes you made last month-if your care and storage conditions are adequate. The major causes of tape deterioration

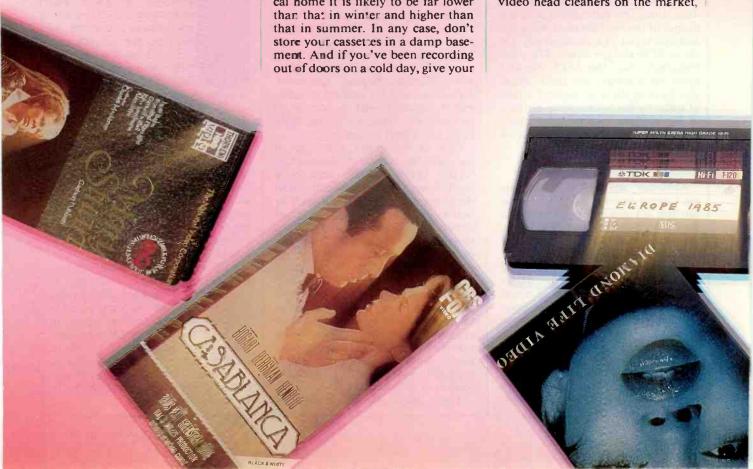
are heat, humidity, dirt, stray magnetic fields, and improper handling.

Heat. Tapes, whether recorded or not, ideally should be stored under a constant temperature of, say, 21° C (70° F). Extreme variations in temperature cause expansion and contraction of the tape base, which could result in long-term deterioration and even oxide shedding, especially with poorly manufactured, off-brand tapes. Therefore, avoid leaving individual tapes in an area where direct sunlight can reach them, and locate your tape storage area away from air conditioners, radiators, and heating vents.

Humidity. For archival storage, a constant humidity of about 55 percent is recommended, but in a typical home it is likely to be far lower than that in winter and higher than that in summer. In any case, don't store your cassettes in a damp basement. And if you've been recording tape (and recorder) an hour or two to return to indoor room temperature-and allow condensation to evaporate-before you start playing it back.

Dirt. Videocassettes are fairly well sealed against dirt when they're in their storage sleeves, but while they're in the VCR the guard shield is raised and the tape is exposed. It's wise, therefore, to keep your VCR and tape storage area as dust free as possible. There seems to be a certain amount of oxide shed from any tape during the record-play process, but the higher the grade of the tape, the less it is likely to shed.

Should you use a VCR head cleaner? The question is somewhat controversial. Although there are perhaps a dozen different brands of video head cleaners on the market,



VITTORIO SAR

most of them from highly reputable manufacturers, some technicians strongly advise against the home use of any head cleaner. In their view, the only way to avoid excessive wear and possible head damage is to return the VCR to a factory-authorized service center for proper cleaning.

My view is that a reputable brand of head-cleaning cassette is not likely to cause problems if it is used only for the brief periods recommended and only when a grainy VCR picture shows that its services are needed. If I had followed the advice of the return-it-to-the-factory group, by now I would have paid for four cleanings of my VCR—aside from the inconvenience of getting it to and from the service center. It seems to me that the money and time saved by using a reputable head-cleaning cassette more than compensate for any additional head wear that it might cause.

since the video picture and sound are embodied on the tape in the form of complex magnetic patterns, any disruption of these patterns by externally applied magnetic fields will affect the picture. Therefore, avoid storing tapes close to or on top of magnetic-field sources such as loudspeakers, TV sets, amplifiers, etc. A distance of at least a couple of feet from these potential problem sources should be more than adequate.

Improper handling. There seems to be general agreement that it is best to store videocassettes vertical-

ly because the chance of edge damage to the tape inside is then minimized. I don't think tape damage from flat storage is likely, however, since even in that position the integrity of the tape pack is protected by the housing.

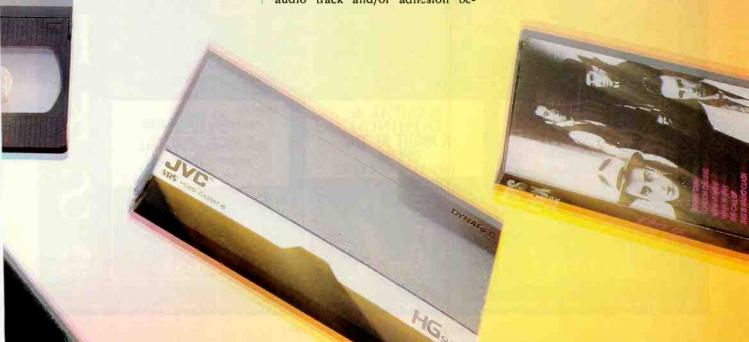
It is probably not a good idea to store tape half-wound, because the internal protective mechanism that keeps the tape pack tight could press creases in the tape that might cause momentary losses of the picture and sound. For much the same reason, it's best not to leave a cassette loaded in the VCR unplayed for long periods. Admittedly, if you've set your machine to tape two weeks of programs while you are on vacation, there isn't much you can do to avoid some risk.

Handle your cassettes with reasonable care. A dropped cassette might become unplayable because of internal or external mechanical damage.

If the phone rings when you are watching a tape, it's best to hit STOP, rather than PAUSE, if your conversation is likely to last longer than a minute or so. Unlike the situation with an audio cassette player, PAUSE on a VCR is the same as FREEZE FRAME, and in this mode the VCR heads repeatedly sweep the tape in one small area. Although most VCR's will automatically switch to STOP after a certain period in FREEZE FRAME, why subject the tape to unnecessary wear?

Some experts suggest that videocassettes that are not played regularly be "exercised" by fast-forwarding and rewinding them at least once a year. The purpose is to prevent possible print-through of the standard audio track and/or adhesion between tape layers. It seems to me that there's no harm in such a procedure, but it could be a time-consuming task given the slowness of most VCR fast-wind nechanisms and the size of many videocasset e collections.

Tape quality. Although I did not list tape quality as one of the factors that causes (or prevents) deterioration, it certainly should be considered when you are taping for posterity—or at least for you-old age. Be assured that none of the better brand-name manufacturers is likely to produce a tape that is subject to early deterioration. Their technology and quality-control procedures are just too good for that to happen. However, every manufacturer does produce tapes in a broac range of prices reflecting their relative audio and video recording quality. Tapes that are intended for high-quality stereo music recording on an appropriate VCR must be virtually dropout free or the sound will be affected. Most manufacturers have a tape that they specify for hi-fi audio/video recording. Ir ary case, it seems logical to me that any tape intended for archival use should be of the very highest grade, and it should be recorded at the fastest speed. These precautions will ensure that the best possible signal quality is available for occasional future viewing and hearing—ever if the program material itself isn't of the highest quality or un versal appeal. After all, how many times will the grandchildren of a fifty-fiveyear-old lawyer want to witness his out-of-tune contribution to a highschool band concert?



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Stereo Review's critics choose the outstanding current releases

DOHNÁNYI'S DAZZLING DVOŘÁK

VORÁK'S pristinely beautiful Symphony No. 8, in G Major, has not lacked for distinguished recorded performances, going all the way back to pre-World War II 78's, but the new one by the Cleveland Orchestra under Christoph von Dohnányi surely ranks among the very best. And while it has formidable rivals even on CD, the balance may be tipped in its favor by the filler piece, the first digital issue of the passionate Scherzo capriccioso, which for me is one of the choicest of Dvořák's smaller works.

Dohnányi and the orchestra give their all throughout the four movements of the symphony in a dazzling performance marked by razorsharp attacks and rhythmic alertness, combined with all the plangent lyricism the music demands. The wind and brass playing is superlative, and special mention should be made of the flute soloist in the finale.

The Scherzo capriccioso here is simply exhilarating, a delight to hear both in the fiery sections and in the ravishing slower passages. The English-horn and bass-clarinet players do an especially fine job in this piece.

From the days of George Szell, Cleveland's Masonic Auditorium has been the locale for many sonically notable recording sessions. In terms of total clarity throughout the audio range, stunning dynamics, and ideal ambience, this recording meets the highest standards set in that hall in the past. Strongly rec-David Hall ommended!

DVOŘÁK: Symphony No. 8, in G Major, Op. 88; Scherzo capriccioso, Op. 66. Cleveland Orchestra, Christoph von Dohnányi cond. LONDON @ 414 422-1 \$10.98, © 414 422-4 \$10.98, © 414 422-2 no list price.



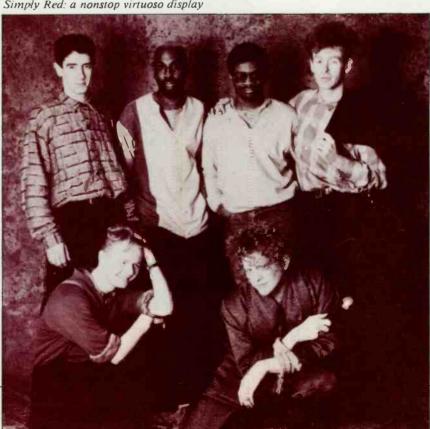
Conductor Christoph von Dohnangi: among the very best

VISCERAL R-&-B FROM SIMPLY RED

HILE the British have always seemed more rabid about American soul and rhythmand-blues than most Americans, British attempts at r-&-b, from John Mayall's Bluesbreakers to Dexy's Midnight Runners, have always come up short. Not so Simply Red. This band, led by vocalist Mick ("Red") Hucknall, has chops B. B. King would be proud to play off, and it has an emotional center that's closer to Memphis, New Orleans, and Chicago than most U.S. bands ever get.

In its debut album for Elektra, "Picture Book," Simply Red smokes through one of the most exciting studio sessions I've heard in years. Hucknall's gutsy blues countertenor (you could almost mistake him for Phoebe Snow) is

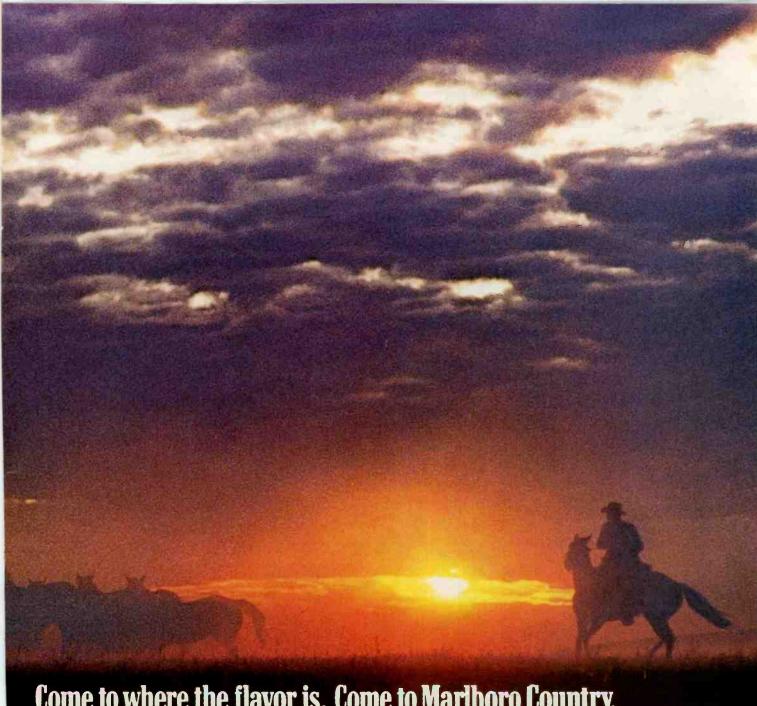
Simply Red: a nonstop virtuoso display





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4x4 FOR FOUR



It won *Popular Mechanics* magazine's "Torture Test" (Sept. '85) by beating seven other 1985 compact 4x4s and a lot of rough terrain. Maxi-Cab 4x4 has shift-on-the-fly Insta-Trac and a wheelbase longer than any of the competitors tested. Available features like the 2.8 Liter V6—now with EFI in '86 models—and off-road suspension with high-pressure Delco/Bilstein gas shocks make Maxi-Cab one remarkable truck. And loads of extra room behind the front seat lets you fit in loads of cargo. You can even opt for front buckets with rear jump seats and have room for four passengers. Chevy S-10 Maxi-Cab 4x4. The 4x4 for four...and more!

Light bar shown can be purchased through outside suppliers. This is not a safety device, Tires supplied by various manufacturers. LET'S GET IT TOGETHER...BUCKLE UP

CHEVY TRU



UCK

one of the most distinctive voices in pop. He doesn't just attack the uptempo songs, he rips the lyrics off the page with his teeth, and his ballad singing is so visceral you wonder how he pulled himself together long enough to stand up at the mike.

Hucknall's performance places him instantly among the great singers of the Eighties, but he doesn't have to go it alone. Side one of "Picture Book" is a nonstop virtuoso display of the rest of the band—the funky bass and drum rhythms of Come to My Aid punctuated by pianist Fritz McIntyre's block chording and Sylvan's syncopated rhythm guitar, the walking-bass and blues-piano octaves of Sad Old Red. the lightning-fast synthesized-horn charts of Look at You Now, and the strutting ensemble riffing of Jericho. It's rhythm-and-blues played with precision and heart. The material on side two doesn't give the band quite as free a range: the slower tunes there focus attention on Hucknall, who proves his mettle by making some otherwise tepid cuts sizzle. This is one record I intend to Mark Peel wear out.

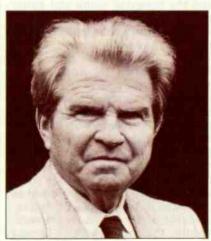
SIMPLY RED: Picture Book. Mick Hucknall (vocals); Fritz McIntyre (keyboards, vocals); Chris Joyce (drums, percussion); Tony Bowers (bass); Sylvan (guitar); Tim Kellett (trumpet); vocal and instrumental accompaniment. Come to My Aid; Sad Old Red; Look at You Now; Heaven; Jericho; Money's Too Tight (to Mention): Holding Back the Years; Red Box; No Direction; Picture Book. ELEKTRA 60452-1 \$8.98, © 60452-4 \$8.98, @ 60452-2 no list price.

EMIL GILELS: BEETHOVEN PURE AND SIMPLE

F the late Emil Gilels has been less in the forefront of many people's minds, particularly in connection with the Beethoven sonatas, than several other major pianists (his juniors as well as his seniors), it's probably because Gilels made less of an imprint in terms of being what the entertainment media call a "personality." I'm certainly not suggesting that Gilels had

no personality. Rather, like the great English pianist Solomon, he never made a self-conscious gesture in the name of "interpretation" but put all his formidable musical powers at the service of the composer. Part of what defined his personality, in other words, is that it was never allowed to get in the way of the music's own character-which he conveyed unfailingly well.

Gilels apparently did not complete his survey of the Beethoven sonatas for Deutsche Grammophon, but those he did record are all exemplary of the very highest standards of musicianship and the deepest levels of satisfaction and convic-



Emil Gilels: exemplary Beethoven

tion for the listener. In two recently released early sonatas, Nos. 2 and 4, as in the other recordings in his cycle, he did not undertake to give us "Gilels's Beethoven" but Beethoven pure and simple. The power of his playing is never exaggerated-it is, in fact, occasionally understated. But the clarity of vision and impeccable technical execution that he brings to these superb performances is at all times remarkable. In short, music making doesn't get much better than this, in any repertoire, and, fortunately, the recorded sound is also just about ideal on all counts.

This is a treasurable release—not as a souvenir of a great artist but simply as a notable addition to the Beethoven discography.

Richard Freed

BEETHOVEN: Piano Sonata No. 2, in A Major, Op. 2, No. 2; Piano Sonata

No. 4, in E-flat Major, Op. 7. Emil Gilels (piano). DEUTSCHE GRAMMO-PHON @ 415 481-1 \$10.98, @ 415 481-4 \$10.98, @ 415 481-2 no list price.

THE FASCINATING WORLD OF JOE JACKSON

OCK'S angry young man has got a lot off his chest with his new album, "Big World." It took the most advanced digital technology to do it, but Joe Jackson has proved that it's still possible to record music the way it was done twenty years ago: in three days, not six months, without infinite overdubbing and remixing. And as if taking a swipe at pop music's obsession with technical overkill weren't enough, Jackson also sounds a warning about America's arrogant, uncomprehending march to moral and political decline around the globe. But you don't have to agree with Jackson's politics to recognize the power and conviction of his music on "Big World."

Sound freaks will find "Big World" fascinating. It was recorded live, digitally, direct to two tracks. While recording to two tracks rather than the customary twenty-four or thirty-two might seem a mathematically simpler propostion, it is, in fact, far more difficult. Every instrument must be in perfect balance during performance. There is no opportunity to adjust the dynamic level or correct any mistakes after the music is on tape—which explains why rock music (even "live" rock music) is never recorded this way. To make it work here, Jackson and his band spent months rehearsing the material for "Big World," playing club dates, and ironing out the technical performance problems before recording the album live over three nights at New York's Roundabout Theatre. Unlike conventional "live" concert albums, there is no crowd noise here: the audience was asked to hold it's applause until the last note of each song had decayed. After the recording was finished, Jackson used Direct Metal Mastering to create the album master,



Joe Jackson: a simmering restlessness, an angry edge

eliminating two "generations" in the disc-making process.

Why did Jackson go to so much trouble to get around the modern conveniences of multitrack recording technology? Part of it was his reaction to the growing dependence of rock artists on electronics-not just for special effects, but to get down a solo or vocal track they couldn't otherwise deliver and even to stay on key or with the beat. The other part, of course, was sound. By stripping away the layers of electronic gauze, Jackson was able to give "Big World" a razor-sharp clarity to match the angry edge in the music.

There wouldn't be much point to all this if "Big World" weren't interesting from a musical point of view. Fortunately, it is. As its title suggests, it is a globe-trotting pastiche of styles and subjects. Jackson returns to the lean, rock-quartet sound of his first albums, although he continues to range over jazz, blues, and reggae. The music is strident and jarring on side one, from the rubbery reverb guitar of Wild West to the angry cadences and demented chords of Right and Wrong to the wobbly Middle Eastern scales of Big World. It then turns quiet and reflective on side two. The moody piano and guitar of Shanghai Sky, the corny accordion of Fifty Dollar Love Affair, the aching vocal chorus of We Can't Live Together, the slowly swaying waltz time of Forty Years Ago-all are classic examples of Jacksonian emotion. Things start shaking again on side three with the shuffling high-school-gym sound of Survival

and the boogying piano and guitar riffs of Soul Kiss.

Fast or slow, a simmering restlessness runs the entire course of "Big World." Songs like Right and Wrong (inspired by Ronald Reagan's infamous speech denouncing Russia as the embodiment of evil on earth), Tango Atlantico (Jackson's wry commentary on the Falklands War), and Forty Years (about the steady disintegration of the old American-European alliances) give the album the appearance of a political statement, but Jackson is just as interested in people, places, and relationships. Big World, for instance, restores the wide-eyed awe foreign places can inspire when not trivialized by global political quarreling.

Jackson's last battle on "Big World" was with the accountants at his record company. He had fifteen new songs-too much for two LP sides, not enough for four. So the LP version of "Big World" is a threesided album on two discs, with one side blank-and, at Jackson's insistence, at the price of one record. Regardless of how you feel about politics or pop, that's a fight everyone can get behind. Mark Peel

JOE JACKSON: Big World. Joe Jackson (vocals, piano, recorder, accordion, melodica); vocal and instrumental accompaniment. Wild West; Right and Wrong; (It's a) Big World; Precious Time; Tonight and Forever; Shanghai Sky; Fifty Dollar Love Affair; We Can't Live Together; Forty Years; Survival; Soul Kiss; The Jet Set; Tango Atlantico; Home Town; Man in the Street. A&M O SP-6021 two discs \$8.98, © CS-6021 one cassette \$8.98, @ CD-6021 one CD no list price.

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IF YOU WANT TO GET TECHNICAL IT ISN'T ONLY FOR COLLEGE.

Discs and tapes reviewed by Chris Albertson Phyl Garland Alanna Nash Mark Peel Peter Reilly Steve Simels

LAURIE ANDERSON: Home of the Brave. Laurie Anderson (vocals, violin, synclavier, keyboards); Joy Askew (keyboards); Adrian Belew (guitars); Dave Van Tieghem (drums, percussion); Richard Landry (saxophone, clarinet); vocal and instrumental accompaniment. Smoke Rings; White Lily; Late Show; Talk Normal; Language Is a Virus: and three others. WARNER BROS. 24500-1 \$8.98, © 24500-4 \$8.98, © 24500-2 no list price.

Performance: Excellent Recording: Excellent

A Spanish-speaking quiz-show host asks a contestant which of two objects, a pineapple or a knife, is more "macho." Naturally, it turns out that the pineapple is more macho than the knife-after all, this is Laurie Anderson.

Home of the Brave" is drawn from the soundtrack for Anderson's first film. her first major attempt to reach the larger audience her work deserves. For those unfamiliar with Anderson's strange jumble of music, story-telling, dance, comic word-play, slapstick, and sight gags, the film and the album are an entertaining introduction to her "performance art." The album, which contains roughly half the music from the movie, is brilliantly performed and recorded

Anderson's music is alive with agitated, continually shifting rhythms and an unending variety of unusual sounds. The results are chaotic, unfamiliar, yet immediately accessible. But for those who know Anderson's previous albums, "U.S.A.," "Big Science," and "Mr. Heartbreak," little on "Home of the Brave" is new or thought-provoking. The phone conversations, the dream interpretations, the stories-virtually everything on the album is either familiar or predictable. It could be considered a summing up, a quick digest of her work to date. But with one fiverecord compilation ("U.S.A.") and two other albums that represent excerpts or variations on that larger work, we have

EXPLANATION OF SYMBOLS:

- DIGITAL-MASTER ANALOG LP
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had enough summaries. It's time Laurie Anderson moved forward again. M.P.

THE ART OF NOISE: In Visible Silence. The Art of Noise (vocals and instrumentals). Opus 4; Paranoimia; Eye of a Needle; Legs; Slip of the Tongue; Backbeat; and five others. CHRYSALIS BFV 41528, © BVT 41528, no list price.

Performance: Seductive Recording: State of the art

"In Visible Silence," an awesome demonstration of the state of the recording art, is the epitome of what, for better or worse, is happening to pop music in the electronic age. The line-up alone cues you to a trend in music personnel: the band includes a recording engineer, a Fairlight programmer, and one bona fide "musician," a keyboard player. The Art of Noise's members, all protégés of Trevor Horn, have contributed their technical wizardry in production or performance to albums by Frankie Goes to Hollywood, ABC, Malcolm McLaren, Wham!, Billy Idol, Scritti Politti, Paul McCartney, Yes, and many others. These are no ordinary sidemen; their technical contributions go a long way toward defining the very sound and character of the performing groups they work with.

Anne Dudley, Gary Langan, and Jonathan Jeczalik wrap layers of simple two- and three-chord tones in a dazzling variety of synthesized sounds, the most prominent of which is the human voice-digitized, sequenced, and sampled to the point that the vocals (there are no lyrics as such) are hardly recognizable as human. While an occasional "real" musical instrument can be heard-some guitar, for instance-virtually everything on this album was created at the keyboard and the digital console.

There isn't room to catalog all the sound effects the trio achieves, but a typically amazing succession occurs on Instruments of Darkness. It opens with a South African minister delivering a speech imposing martial law. A synthesized string choir begins playing a Holstian theme when a voice interrupts, saying "the fuse is lit," at which point the strings hit a thunderous note that sounds like an explosion. The strings then play through a series of brief explosive attacks, which gradually wind down as the tape is slowed, finally ending with what at first sounds like a stylus scratching back and forth against the record grooves and then a nuclear detonation. Terrifying stuff.

The insidious thing about the Art of Noise is that while I regard their work philosophically as the death of music, the record is all but irresistible. It's technology working directly on the reptilian brain stem-as shallow and cheap a thrill as a hallucinogenic drug, and just as effective.

CHET ATKINS: Street Dreams. Chet Atkins (guitar): instrumental accompaniment. Spats 'n' Hats; The Crystal in the Light; The Official Beach Music; (If You'll) Stay a Little Longer; Classical Gas; and five others. COLUMBIA O FC 40256, @ FCT 40256, @ CK 40256, no list price.

Performance: Chet stretches out Recording: Excellent

In the last few years, Chet Atkins has become fond of writing "C.G.P.," for Country Guitar Picker, after his name. It's a fitting moniker for a backwoods, barn-dance musician, I suppose, but it's a touch too humble for a man considered to be one of the world's foremost guitarists, especially a musician adept at so many different styles.

That signature is particularly misleading on "Street Dreams," since a mere country guitar picker would have a heck of a time trying to figure out what's going on. This is more of a lightjazz album, or I should say a fusion of country and jazz. As usual, Atkins's insistence on making his music commercially accessible to the masses makes his artistry sound deceptively simple and commonplace, particularly on a reworking of Mason Williams's Classical Gas. Don't let the ol' boy fool you, though. No matter how you look at it, this is charming music, an antidote for a month's worth of stress. A.N.

BODEANS: Love & Hope & Sex & Dreams. BoDeans (vocals and instrumentals). She's a Runaway: Fadeaway: Still the Night; Misery; Say You Will; Ultimately Fine; and five others. SLASH/WARNER BROS. 25403-1 \$8.98. © 25403-4 \$8.98.

Performance: Onto something Recording: Good

The music of the fast-paced quartet called BoDeans is a subtle, savvy, and intelligent interweaving of country, folk, and root-level rock-and-roll, wrapped in a cloak of cool. In other words, much of this album is a sort of Bob Dylan meets the Everly Brothers kind of music, especially in Sammy Llanas's Dylanesque lead singing and in his Phil-and-Don harmonies with Kurt Newmann-otherwise known as Beau BoDean. On side two, however, the Bo-Deans' music pays great homage to early Elvis, and throughout you'll find instrumental references to the Beatles as they were influenced by the Everly Brothers and American r-&-b. Sometimes, in fact, when Llanas handles the lead vocals-on Misery, The Strangest Kind, and Ultimately Fine-you get the odd feeling that you're listening to Dylan sing a catalog of newly discovered Presley tunes, songs with lyrics that still revolve around the heart but with a mainline hookup to the head.

The important thing is that the Bo-Deans don't just surgically graft this stuff together; it all comes out of some higher sensibility and synthesis of style. And producer T-Bone Burnett, part of the old Alpha Band as well as a big part of Dylan's old Rolling Thunder Revue, knows a lot about integrating styles and keeping things suitably raw and loose. This is a most impressive debut album. With any luck, it just might be a real sleeper.

A.N.

BRENDA & THE BIG DUDES: Weekend Special. Brenda & the Big Dudes (vocals and instrumentals); instrumental accompaniment. Weekend Special; I Wanna Be Single; Gimme Your Love; If I Hurt You Little Boy; Bongani; and three others. CAPITOL ST-12482 \$8.98, © 4XT-12482 \$8.98.

Performance: A real surprise Recording: Good

At first this album appears to be by a black vocal-instrumental group from, say, Harlem or Detroit, but a check of the credits reveals that the artists have names like Desmond Molatana, Dumisane Ngubeni, and Fats Mlengeni. Brenda & the Big Dudes are, in fact, black South Africans, and their tracks were recorded in that country. Additional instrumentals and remixing were done in New York. Even if you scratch beneath the surface of the U.S.-added "sweetening," however, you'll find that the music still has the ring of contemporary American pop. There's nothing wrong with that, of course, though I do wish the sound had remained a bit more exotic. When vocalist Brenda Fassie and her band do veer a bit away from the established course, as on Bongani, which has a slight African flavor, they are not just good but stunning.

CULTURE CLUB: From Luxury to Heartache. Culture Club (vocals and instrumentals); vocal and instrumental accompaniment. Move Away; I Pray; Work On Me Baby; Gusto Blusto; Heaven's Children; and five others. VIRGIN/EPIC OE 40345, © OET 40345, no list price.

Performance: Bland Recording: By the numbers

"From Luxury to Heartache" shows why an album doesn't have to be ugly or inept to be bad. Bland will do just as surely. When Culture Club first hit the U.S., the band had to work hard to overcome America's prudish skepticism. Now that Boy George's outrageous androgyny is more an asset than a liability, however, they seem to be on automatic pilot. Part of the problem is Arif Mardin's production. Mardin



KATRINA AND THE WAVES

ELIEVE it or not, there are actually some cynical souls out there who think that Katrina (Leskanich) and the Waves are too lightweight and unabashedly cheerful to be taken seriously. For those people I have only one word: phooey.

These three Brits and their American chanteuse are not exactly on rock's cutting edge, I admit, and they don't deal much with anything beyond the primary subtext of rock-and-roll, which is cars and girls (or cars and boys in Katrina's case). No messages here. And, yes, they wear their influences—old r-&-b, early guitar-rock, Richie Valens-like Tex-Mex, and Beatlesseque songcraft—on their collective sleeve. But none of that matters on any essential level. What does matter is that Katrina and the Waves know how to entertain.

"Waves," the follow-up to their 1985 major-label debut, may lack the immediate grabbiness and energy that made its predecessor such a delight, but it has much that warrants attention nonetheless. Perhaps the best thing on it is Is That It?, a wonderful horn-laden Stax/Volt-inspired dance tune in which Katrina finds herself slightly under-

whelmed by the blandishments of a current paramour. Other especially winning tracks include Sun Street, a shamelessly retro slice of British Invasion whimsey via the early Kinks or Small Faces, and Love That Boy, one of the group's trademark rave-ups by way of La Bamba and Buddy Holly.

The concluding Stop Trying to Prove (How Much of a Man You Is) is an inspired piece of feminist blues bashing, the kind of thing Janis Joplin might have done if her tongue had been more firmly in cheek. The rest is high-class pop rock, 1986-style. You should hear all of it, and soon. The songs may not mean much, but this is a wonderful band. As Sam Goldwyn said, "If you want to send a message, call Western Union." Steve Simels

KATRINA AND THE WAVES: Waves. Katrina and the Waves (vocals and instrumentals); other musicians. Is That It?; Tears for Me; Sun Street; Lovely Lindsey; Riding Shotgun; Sleep on My Pillow; Money Chain; Mr. Star; Love That Boy; Stop Trying to Prove (How Much of a Man You Is). CAPITOL ST-12478 \$8.98.

could make the Art Ensemble of Chicago sound like ABBA, and his production here is glitzy, sanitized, and utterly conventional. Every song sounds as if it had been written and arranged for an American Bandstand listening test. So the fate of these proceedings rests on Boy George's pipes—still an appealing instrument but one that's growing less

and less like the vintage Smokey Robinson he was once compared to and more like the middle-aged Smokey of the late Seventies.

"From Luxury" isn't a total write-off. It closes strongly with two killer dance tracks—the angry Too Bad and the hot Sexuality. But wading through a side and a half of what amounts to "The

IMON FOWLER/CAPITOL RECORDS

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Culture Club Mike Douglas Sessions" to get to two good tunes hardly seems worth the effort.

GREEN ON RED: No Free Lunch. Green on Red (vocals and instrumentals). Keep on Moving; Honest Man; Ballad of Guy Fawkes: No Free Lunch: and three others. MERCURY 826 346-1 \$8.98, © 826 346-4 \$8.98.

Performance: Interesting in spurts Recording: Good

Green on Red got lumped in with the Los Angeles Paisley Underground movement (to their chagrin, apparently), but they're on the Angry Young Cowpunk end of that particular spectrum. They sound vaguely like the Stones circa "Let It Bleed," Dylan circa "Blonde on Blonde," and Gram Parsons after a three-week bender. Lead singer Dan Stuart does the best imitations of early Mick Jagger I've ever heard from anybody I didn't go to high school with, and the rest of the band makes a fairly convincing acid-country racket behind him. The songs are probably a matter of taste.

I like the Ballad of Guy Fawkes, a political screed in which Stuart castigates Ronald Reagan, Lenin, Ghandi, and Che Guevara (although he mumbles so determinedly that at first I thought he was talking about Jake Riviera, Elvis Costello's old manager). And I also cotton to the title song, a very funny rockabilly history of the group in which they lament that "all our friends were Republicans or on heroin." The rest, including what must be the wooziest cover of a Willie Nelson song in memory (Funny How Time Slips Away), is fairly tough sledding unless you're a fan of the genre. But there is something going on here, and you could do worse than to check it out.

HUMPE HUMPE. Humpe Humpe (vocals); instrumental accompaniment. Three of Us; Happiness Is Hard to Take; Can't Leave the Pool; Don't Know Where I Belong; Belle Jar; and five others. WARNER BROS. 25402-1 \$8.98, © 25402-4 \$8.98.

Performance: Hot stuff Recording: Very good

Imagine, if you can, what the McGarrigle Sisters might sound like if they came from Germany, and you have a vague idea of what to expect from Humpe Humpe. Like Kate and Anna, the Humpes are sisters, Anete and Inga. And while the McGarrigles sing some songs in English and some in French, the Humpes offer songs in English, German, Japanese, and Spanish, singing more as one voice than in a traditional lead-and-harmony format.

As you might expect, the Humpe sisters' song structures are totally unpredictable. Again like Kate and Anna, much of their material sounds born of amateurism, but it is utterly winning, with strong Europop underpinnings and obvious influences from Laurie Ander-

son and Depeche Mode—made even more obvious by the use of Anderson's producer, Roma Baran, and Depeche Mode's engineer, Gareth Jones. But the Humpes take eccentricity to a bold extreme. The opening cut and first single, Three of Us, offers a lesbian twist on the lovers' triangle, followed by an ode to masochism, Happiness Is Hard to Take. Side one ends up with Don't Know Where I Belong, a letter to a psychiatrist explaining why "I skipped the couch today." Obviously, the girls have a sense of humor to match their musical talents. But when you're born with a name like Humpe, I suppose it's a necessity of survival. A.N.

JOE JACKSON: Big World (see Best of the Month, page 107)

LET'S ACTIVE: Big Plans for Everybody. Let's Active (vocals and instrumentals). In Little Ways; Talking to Myself; Writing the Book of Last Pages; Last Chance Town; Badger; and six others. I.R.S. IRS-5703 \$8.98, © IRSC-5703 \$8.98.

Performance: Mystery rock Recording: Very good

Here's a difficult-to-classify little album that should appeal to pop formalists of all ages. Fronted in a neo-Chipmunk voice by Mitch Easter, the music is built up with layered acoustic guitars and imaginative production touches that recall acid-era Beatles. The massed guitars, strings, backward sound effects, and the like display the kind of Southern Gothic sensibility you'd expect from a guy who once worked with R.E.M. Oddly enough, perhaps the most accessible track is the concluding Route 67, a demented slide-guitar workout with a Bo Didley beat. Unless I am very much mistaken, it bespeaks a youth at least partially spent with old

Leo Kottke records. Fans of early Big Star or current DB's records will find this highly reassuring stuff.

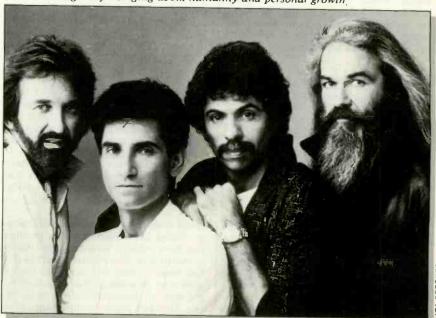
RONNIE MILSAP: Lost in the Fifties Tonight. Ronnie Milsap (vocals, keyboards); vocal and instrumental accompaniment. Lost in the Fifties Tonight (In the Still of the Night); Old Fashioned Girl Like You; I Heard It Through the Grapevine; Don't Take It Tonight; and six others. RCA AHL1-7194 \$8.98, © AHKL-7194 \$8.98, @ PCD1-7194 no list price.

Performance: Heart attack Recording: Exceptional

For all his superior technical skills, Ronnie Milsap too often turns in album performances that reek with the sort of glossy shallowness undiscriminating listeners mistake for soul. There's a certain amount of that here, particularly in his cover of Barrett Strong's Money (That's What I Want), but when Milsap buckles down and croons, when he gets his heart as involved as his fingers, he's hard to beat for seamless, ingratiating pop. There's a lot of that on this album, which is built around the Grammy winner Lost in the Fifties Tonight (In the Still of the Night). To go with it, Milsap subtly weaves together material from three decades to create an overall romantic, reflective mood reminiscent of slow-dance sock hops and fluttery innocence. With only one real exception, the tunes are engaging, evocative, and dressed to perfection, with loving attention to the smallest instrumental detail and only a small nod to Nashville formula.

OAK RIDGE BOYS: Seasons. Oak Ridge Boys (vocals); instrumental accompaniment. Seasons; What Are You Doing in My Dream; Don't Break the Code; Juliet; You Made a Rock of a

The Oak Ridge Boys: singing about humanity and personal growth



Rolling Stone; Take a Step (Yesterday Waltz); and four others. MCA O MCA-5714 \$7.98, © MCAC-5714 \$7.98.

Performance: New maturity Recording: Excellent

After a particularly flaccid album last time out, the Oak Ridge Boys have come back with a surprisingly varied and able contender. With the exception of Juliet, a mindless, ultra-commercial ditty in the vein of Elvira, the program is unusually thoughtful and grown-up compared with much of the quartet's previous material. These are adults singing about mature ideas and situations-about humanity, personal growth, codes of ethics, and responsibility to loved ones-not the usual radio fare of hedonistic pleasure and self-centered image. The songs never get heavyhanded, though. Not every tune is a winner, but the engineering makes up for almost anything-never have the Oaks' voices sounded so stirringly vibrant or so thoroughly musical.

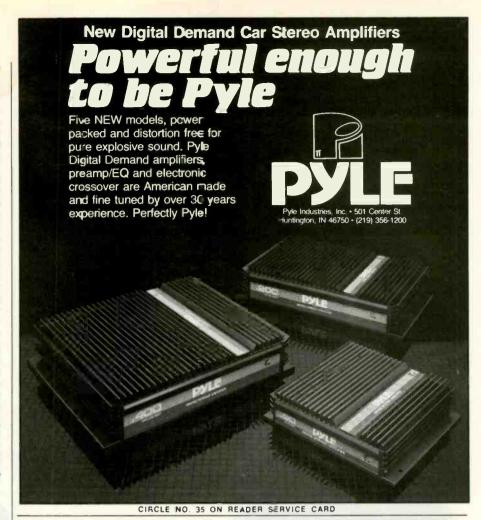
PRINCE AND THE REVOLUTION: Parade. Prince and the Revolution (vocals and instrumentals); vocal and instrumental accompaniment. Chistopher Tracy's Parade; New Position; I Wonder U; Under the Cherry Moon; Girls & Boys; and seven others. WARNER BROS. 25395-1 \$8.98, © 25395-4 \$8.98, © 25395-2 no list price.

Performance: PG-13 Recording: Excellent

Until now Prince's records have been sprawling, runaway affairs, like walking into a bacchanal of frightening intensity. It wasn't simply his explicit lyrics, which revealed an almost Jovian licentiousness, but his raucous, freewheeling brand of funk-loud, thwacking bass and even louder, practically ear-splitting whipcrack percussion. So what's happening here? In "Parade" Prince has created a quiet, pretty album whose lyrics actually leave something to the imagination.

The arrangements on "Parade" are leaner and more daring, combining the spare but clean sound of muted trumpets, woodwinds, and strings with occasional bursts of splintered piano chords and fractured drumming. The album's erratic changes of mood keep you off balance and attentive. At the conclusion of side one, for instance, it shifts from the euphoric flute-and-synthesizer calland-response of Life Can Be So Nice to the placed interplay of piano and strings on the ballad Venus de Milo. There are dozens of inventive details and memorable moments-the Strawberry Fields woodwinds and trumpets that march along in Christopher Tracy's Parade, the flutes that echo Prince's vocal in I Wonder U, the laughing baritone sax of Girls and Boys, the prancing strings and strip-show brushstrokes of the snare drum on Do U Lie.

Prince, of course, is still Prince: somewhere between Sly Stone and Mae West. His lascivious intonation suggests



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he's licking chocolate from his fingers as he coos, "I love you baby, love you so much/... maybe we should stay in touch." Still, there's nothing on "Parade" you need to worry about suppressing when the neighbors' kids are MP around.

SIMPLY RED: Picture Book (see Best of the Month, page 103)

ZENO. Zeno Roth (guitar, vocals); Michael Flexig (lead vocals); U. Winsomie Ritgen (bass, vocals); vocal and instrumental accompaniment. Eastern Sun; A Little More Love; Love Will Live; Signs on the Sky; Far Away; and six others. MANHATTAN ST-53025 \$8.98, © 4XT-53025 \$8.98.

> Performance: Labored Recording: Good

I'm sure it wasn't Zeno's intention, but the cover illustration on the band's debut album neatly sums up the contents: a young boy standing along a highway at sunset seems to be catching the last rays of sunlight in his left hand. But because his hand is held up against his ear, it looks as though the sun is shining through the boy's head. Zeno's music is just as empty-headed, although it's less apt to inspire laughter than impatience. This album is AOR mysticism at its wimpiest.

AZZ

TONY BENNETT, MARION AND JIMMY MCPARTLAND: Tony Bennett/The McPartlands and Friends Make Magnificent Music. Tony Bennett (vocals); Marion McPartland (piano); Jimmy McPartland (trumpet); Charlie Byrd (guitar); other musicians. Watch What Happens; Softly As in a Morning Sunrise; Lonely Avenue; Let's Do It; Stompin' at the Savoy; In a Mellow Tone; and four others. DRG MRS 910 \$8.98, @ MRSC 910 \$8.98.

Performance: First-rate Recording: Live and lifelike

Behind the awkward album title lies a better-than-average selection of taped excerpts from a session that took place in a Buffalo, New York, club in May 1977. It's a generally easygoing session, of the type that (for me, at least) bears more repeat listening at home than a whole album by the same singer or instrumentalist. Best of all, of course, is the chance to hear Tony Bennett, Marion McPartland, Jimmy McPartland, and Charlie Byrd together.

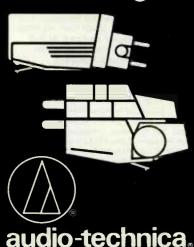
Bennett makes quiet magic with both Watch What Happens and While We're Young, and he closes the set with a letit-all-hang-out version of I Left My Heart In San Francisco that shows some of the wear and tear of the years on his voice but not on the vitality of his delivery. Other highlights are a deliciously sly Let's Do It by Byrd and Ms. McPartland's trio and a refreshingly upbeat (though not unsoft) Softly As in the Morning Sunrise. Roy Hemming

FREDDIE HUBBARD, WOODY SHAW: Double Take. Freddie Hubbard (trumpet, flugelhorn); Woody Shaw (trumpet); Kenny Garrett (flute, alto saxophone); Mulgrew Miller (piano); Cecil McBee (bass); Carl Allen (drums). Boperation; Lotus Blossom; Lament for Booker; Desert Moonlight; Sandu; Just a Ballad for Woody; Hub Tones. BLUE NOTE @ BT 85121 \$9.98, © 4XT 85121 \$9.98.

> Performance: Provocative Recording: Excellent

In their new "Double Take" album, trumpeters Woody Shaw and Freddie Hubbard are not, as producer Michael Cuscuna points out, engaged in a "cutting" contest where one player blows himself blue in the face to outdo the other. In fact, both players are commendably restrained. The game plan for most of the tracks has the two leaders paving the way to a series of solos with a unison statement of the theme, which is repeated at the end. Two selections

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depart from this format: Just a Ballad for Woody and Lament for Booker. Written by Shaw's wife, the former owes a debt to Body and Soul and features sensitive solos by Shaw and Kenny Garrett on flute. The latter is a 1962 Hubbard tribute to the memory of trumpeter Booker Little. Played on the flugelhorn by Hubbard, its backbone is a fragile melodic line whose structure and arrangement is oddly reminiscent of The Day After, a little-known Tom Macintosh tune recorded by Howard McGhee almost two years earlier. With wonderful bass support from Cecil McBee and a good foundation laid down by pianist Mulgrew Miller and drummer Carl Allen, this is, all in all, a nice album, but you will wait in vain for goose bumps.

MILTON NASCIMENTO: Meetings and Farewells. Milton Nascimento (vocals, guitar); Nico Assumpção (bass); Tulio Mourão, Wagner Tiso (keyboards); other musicians. Raça; A primeira estrela; Mar do nosso amor; Radio experiência; Quem perguntou por mim; and five others. POLYDOR @ 827 638-1 \$8.98, © 827 638-4 \$8.98.

Performance: Winning Recording: Very good

IVAN LINS: Juntos. Ivan Lins (vocals, keyboards); vocal and instrumental accompaniment. Novo tempo; Começar de novo; Abre alas; Formigueiro; Dinorah. Dinorah: and eight others. PHILIPS 822 672-1 \$8.98, © 822 672-4 \$8.98.

Performance: Brazil ruts Recording: Very good

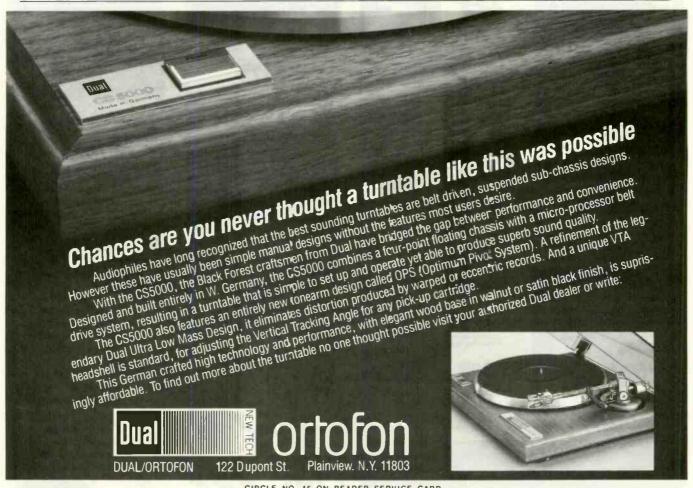
Since his arresting presence on Wayne Shorter's 1975 Columbia album, "Native Dancer," singer/composer Milton Nascimento has helped generate a new Brazilian influence on American pop jazz. Ever since the tango began to slide American couples across parquet floors in the Twenties, we have seen periodic musical invasions from south of the border. The present one from Brazil is more subtle than the Bossa Nova fad of the early Sixties. This time it is not one particular rhythm but a multitude of refined percussive and melodic twists that are slowly being woven into our pop and jazz fabric.

In the process of becoming an international star, Nascimento has occasionally succumbed to the fusion trap that has downgraded so many of our own players, but he comes through it all unscathed on "Meetings and Farewells," which is one of two albums launching PolyGram's Brazilian Wave series. Granted, this is decidedly a commercial release, laced with as many as twenty-eight strings and fourteen voices, and it is considerably glossier than the sounds that shaped Nascimento's artistry in the province of Minas Gerais during the early Forties. And to make absolutely sure that we pay attention, the producers have thrown in Hubert Laws and Pat Metheny for good marketing measure. They're barely noticeable, however, on the two tracks they play, and their presence serves no real musical purpose.

What we do hear is Nascimento's silken voice, in Portuguese, sailing through eleven of his own enchanting songs with the kind of emotional power we used to hear from Piaf. Yes, he also plays guitar, but it is his voice and his material that

grip us.

Ivan Lins is a Brazilian composer, singer, and pianist whose music is better known than his name. Sarah Vaughan, Ella Fitzgerald, and Carmen McRae are among the American singers who have recorded his songs, and you can add him to the list of performers whose talent has been exploited by Quincy Jones, but "Juntos," the other release in the new series, is his first American album. It is a good example of the new Brazilian influence on American music-or, if you will, the Americanization of Brazilian artists. The inspiration clearly flows two ways, but Lins's album does neither side justice. This one is a bland Brazilian splash the current wave can do without. C.A.





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CIRCLE NO. 39 ON READER SERVICE CARD

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

BARTOK: Allegro barbaro; Three Rondos on Folk Tunes; Three Hungarian Folk Tunes; Suite, Op. 14; Piano Sonata; Romanian Folk Dances; Old Dance Songs (from Fifteen Hungarian Peasant Songs). Zoltán Kocsis (piano). DENON © C37-7813 no list price.

> Performance: Lyrical Recording: Excellent

As a Hungarian musician, Zoltán Kocsis responds to the ethnic content of these works comfortably and idiomatically, without having to work at it. The happy consequence is that the "ethnicity" is unlabored and musical values emerge with special clarity in his predominantly lyrical approach. The piano is reproduced with exemplary realism, and the recording sounds even more stunning now on CD than it did on the original LP version issued about a decade ago. It does seem odd to be offered only the final group from the Fifteen Hungarian Peasant Songs, but Bartók designed that portion to be more or less detachable, and it provides an effective conclusion to an enjoyable program of his most familiar keyboard works. R.F.

BEETHOVEN: Piano Sonatas Nos. 2 and 4 (see Best of Month, page 107)

DVOŘÁK: Symphony No. 8, in G Major, Op. 88; Scherzo capriccioso, Op. 66 (see Best of Month, page 103)

HANDEL: Samson. Dame Janet Baker (soprano), Dalila; Helen Watts (contralto), Micah; Robert Tear (tenor), Samson; John Shirley-Quirk (bass), Manoah; Benjamin Luxon (bass), Harapha; Felicity Lott (soprano), Messenger, Israelite Woman; Philip Langridge (tenor), a Philistine; others. London Voices: English Chamber Orchestra, Raymond Leppard cond. ERATO/RCA STU 71240 four discs \$43.98.

Performance: Fabulous Recording: Great

Recorded in London at the Henry Wood Hall in 1978, this rousing per-

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"ORIGINAL" BEETHOVEN



Fortepianist Anthony Newman

NEW digital recording of Beethoven's Third Piano Concerto on the equally new Newport Classic label proves to be of unusual interest. It is one of the few Beethoven piano-concerto recordings yet available featuring "original" instruments and performance practices common in early nineteenth-century Vienna. The soloist, Anthony Newman, has chosen to use a modern copy of an 1815 Viennese Graf fortepiano, which was much favored in its day for its light keyboard action.

In his interesting and informative notes, Newman describes some of the singular features of the Graf as well as

the performance practices of the time, such as having the fortepianist play along with the orchestra in a kind of continuo. Newman also chose to use his own brilliant and lengthy cadenza for the first movement instead of the one Beethoven composed.

Taken as a whole, Newman's fleetfingered performance is brilliant in the extreme, and I'm glad he used an instrument that is less twangy than some fortepianos I have heard on records in the past. Compared with most modernpiano performances, Newman favors a distinctly detache fingering style, but thanks to the Graf's light keyboard action and a lighter sonority than modern concert grands, the resulting sound

is far from dry.

Newman is accompanied by the Philomusica Antiqua of London. The sound of its reduced string body and aggressive, almost strident woodwind section is both arresting and fascinating to the ear. Stephen Simon does a forthright, if not exactly scintillating, job as conductor. By and large, the soloist carries the performance, and he is generally favored within the otherwise intimate acoustic surround. As a filler (bringing the total playing time to forty-two minutes), Newman gives us a powerful reading of Mozart's great C Minor Fantasia, which also has much to reveal on the early instrument. David Hall

BEETHOVEN: Piano Concerto No. 3, in C Minor, Op. 37. MOZART: Fantasia in C Minor (K. 475). Anthony Newman (fortepiano); Philomusica Antiqua, Stephen Simon cond. NEWPORT CLASSIC @ NC 30007 \$9.98, @ NCD 60007 no list price.

formance of Handel's Samson is now finally available in this country. The cast is stellar, and Raymond Leppard's concept is fittingly grand.

Robert Tear's portrayal of Samson leads us from his abject slavery to his moral regeneration in the carefully calculated confrontations with his father, his wife, and a Philistine warrior. Sung respectively by John Shirley-Quirk, Dame Janet Baker, and Benjamin Luxon, these characters epitomize sorrow, sensuality, and brute force. Helen Watts as the sympathetic Micah sustains her contemplative role with complete dignity and warmth, and Felicity Lott discharges "Let the Bright Seraphim" as brilliantly as Gerald Ruddock proclaims his trumpet obbligato. As a bonus, Dame Janet has appropriated all of the soprano airs in the first part for herself, and she makes a great show of them. In short, this is English oratorio at its best.

LISZT: Années de pèlerinage, première année: Suisse. Daniel Barenboim (piano). DEUTSCHE GRAMMOPHON @ 415 670-1 \$10.98, © 415 670-4 \$10.98, © 415 670-2 no list price.

> Performance: Poetic Recording: Very good

LISZT: Années de pèlerinage, première année: Suisse. Joseph Villa (piano). SECOND HEARING @ GS 9006 no list

Performance: Intense Recording: Close-up

Daniel Barenboim's recording of the "Swiss" year of Liszt's Années de pèlerinage, made back in 1979, has apparently not been issued until now. It is very welcome even among several distinguished issues in observance of the Liszt centenary. Between it and the recent recording by Jorge Bolet there is, in fact, little to choose-and no possibility of anything resembling disappointment. Barenboim's older-and analog-recording actually sounds smoother and warmer than Bolet's new digital one. Perhaps the difference is

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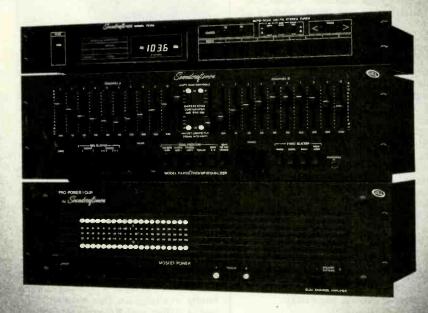
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accounted for by the respective instruments: Bolet's tends to sound just a bit clangy at the top, while Barenboim's is gratifyingly pearly. Barenboim's performance itself is sheer poetry, in the vigorous sections as well as the reflective ones.

The difference in recorded sound, or sonic focus, makes for a much stronger contrast between the Barenboim and Joseph Villa recordings. Villa gives a fairly dramatic reading of these pieces. In general his tempos are brisker than Barenboim's, but in the longest piece, "Vallee d'Obermann," they do not enable him to hold the various contrasting sections together as seamlessly as Barenboim does. If Villa seems more concerned with vigor and intensity than with the sort of poetry Barenboim distills from this material, it may be in part because of his less successful realization of the music's structural integrity. No less a factor, however, is the very closeup recording, which gives an exceptionally realistic image of the piano but makes the listener too aware of the instrument, the recording, and the performer. Villa's thunderous machine seems to get in the way of the music, while Barenboim's more judiciously focused recording allows-compels-the listener to forget about everything but R.F.the music.

LUTOSLAWSKI: Symphony No. 3; Les Espaces du sommeil. John Shirley-Quirk (baritone); Los Angeles Philharmonic, Esa-Pekka Salonen cond. CBS O IM 42203, © IMT 42203, © MK 42203, no list price.

Performance: Handsome Recording: Very good

Witold Lutoslawski is the senior and much-honored member of the "Polish Modern School" that emerged in the late Fifties and includes as one of its junior members the perhaps betterknown composer Krzysztof Penderecki. Beginning stylistically as a post-Bartókian, Lutoslawski eventually evolved his own personal, expressionist musical language-pantonal, highly colored in terms of orchestration, occasionally employing aleatoric procedures but never sacrificing formal control for the sake of momentary sensation.

Lutoslawski wrote his Third Symphony for Sir Georg Solti and the Chicago Symphony, which gave its world première on September 29, 1983. It is in three connected movements laid out in roughly a prelude-allegro-epilogue format, and whatever one might read into it by way of a "message," there is no question that the hand of a master is at work from start to finish. Form and content are well and truly integrated along the lines of post-World War II advanced yet mainstream musical discourse, striking, you might say, a highly communicative middle ground between the stern control of a Milton Babbitt and the cheerful anarchy of someone

like John Cage. The companion work, Les Espaces du



James Conlon: satisfying Poulenc

sommeil (Sleep's Spaces), was composed for Dietrich Fischer-Dieskau to a text by the French poet Robert Desnos, who died tragically a month after VE Day as a result of concentration-camp imprisonment. Lutoslawski's musical setting follows the imagery of the poem with the utmost vividness, and the vocal line and the richly variegated orchestral colors reinforce one another from the extraordinarily evocative opening pages to the explosive end.

Baritone John Shirley-Quirk is in superb vocal form here, and his French pronunciation is remarkably clear and intelligible. The young Finnish conductor Esa-Pekka Salonen shows his mettle in repertoire that puts both him and the Los Angeles Philharmonic to the test. not to mention the recording engineers. All come through with flying colors, and the Dorothy Chandler Pavilion proves a fine recording venue for the biting rhythmic figures and vivid soloistic coloration of Lutoslawski's music. All told, a highly recommended disc, especially for contemporary-music enthusiasts. D.H.

NIELSEN: Symphony No. 4, Op. 29 ("The Inextinguishable"); Helios Overture, Op. 17. Swedish Radio Symphony Orchestra, Esa-Pekka Salonen cond. CBS • IM 42093, © IMT 42093, © MK 42093, no list price.

> Performance: Mostly splendid Recording: Spacious

In May of last year I heard Esa-Pekka Salonen conduct this symphony in his debut with the National Symphony Orchestra in Washington. He was then twenty-six and looked even younger, but the concert was stunning: clearly, Salonen not only knew the music but knew how to get an orchestra to give its very best. Now the young Finnish conductor and the Swedish orchestra he took over last fall have embarked on a recorded cycle of all the symphonies of

Denmark's greatest composer, beginning with the one most favored on the international circuit. There are magnificent moments in this Nielsen Fourth. though it is not without flaws.

The Swedish Radio Orchestra sounds marvelous here-in its entirety, in its various individual choirs (except the winds at certain points), and in the admirable overall balance-while the recording itself, made in Berwald Hall, conveys the most realistic and spacious sonic image. The opening is splendid, but there is a bit of conspicuous gearshifting later in the movement that impedes the momentum. The pulse is not as steady as it might be in the slow movement either, and some of the winds are out of tune in the scherzo, but the concluding section is sheer glory.

The only other Nielsen Fourth on CD so far is Herbert von Karajan's, whose Berlin Philharmonic winds have no problems but whose overall performance is less compelling than the young Finn's and less impressively recorded. With a total playing time of thirty-eight and a half minutes, it is also poor value for an entire CD. CBS provides the Helios Overture as filler. Salonen's pacing of it is brisker than the norm, but there is no suggestion of haste. This is as fresh, buoyant, and altogether splendid a performance of the piece as you're likely to hear-and it too is enhanced no little by the spacious sonics.

A promising beginning, then, for a cycle that could do much to establish Nielsen's symphonies more firmly in the general repertoire. R.F.

POULENC: Concerto for Organ, Strings, and Timpani; Concert champêtre for Harpsichord and Orchestra. Marie-Claire Alain (organ); Ton Koopman (harpsichord); Rotterdam Philharmonic Orchestra, James Conlon cond. ERATO/RCA O NUM 75210 \$10.98, © MCE 75210 \$10.98, @ ECD 88141 no list price.

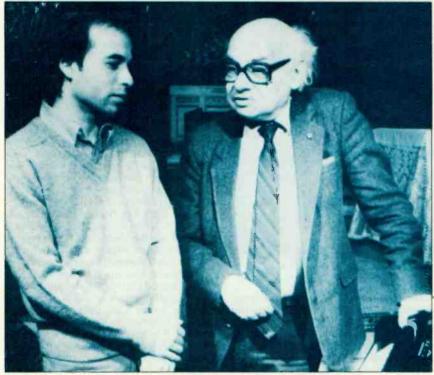
Performance: Excellent Recording: Gorgeous

POULENC: Concerto for Two Pianos and Orchestra; Piano Concerto; Aubade. François-René Duchable, Jean-Philippe Collard (piano); Rotterdam Philharmonic Orchestra, James Conlon cond. ERATO/RCA O NUM 75203 \$10.98, © MCE 75203 \$10.98, © ECD 88140 no list price.

Performance: Satisfying Recording: Piano(s) too close

It was a lovely idea to record all of Poulenc's concerted works in two volumes and a nice touch to make them available separately. Marie-Claire Alain's earlier recording of the Organ Concerto, with Jean Martinon conducting, always struck me as one of the strongest realizations of that work's solo part, and it is good to have her authoritative contribution again, this time recorded with striking realism on the splendid instrument in the Rotterdam De Doelen concert hall. Ton Koopman gives a very

THE ACCESSIBLE BABBITT



Pianist Robert Taub with Milton Babbitt

ILTON BABBITT turned seventy in May, and in honor of that occasion Harmonia Mundi U.S.A. produced a recording of all of his piano music played by Robert Taub. It has been Babbitt's fate, as far as the general public is concerned, to be one of those composers whose names are known but whose music is not. He is identified with the synthesizer and electronic music, with pedagogy, with analytical writings on the music of our century. Most of his important works are available in first-rate recordings now, but it takes a hardy soul to investigate them in the face of repeated caveats that Babbitt's music is "inaccessible," or that it is meant only for an elite inner circle of academic musicians.

The six works on side one of the beautifully recorded new disc are about as "inaccessible" as the Gershwin preludes. In fact, some inflections in the earliest pieces, the Three Compositions of 1947-1948, may remind us that Babbitt too had productive experience in jazz in his youth. As a youngster in Jackson, Mississippi, he came under the spell of Bix Beiderbecke, though he took up the clarinet and alto saxophone instead of Beiderbecke's trumpet, and at age ten he sat in with more than a dozen professional jazz bands as both performer and arranger. Among his other early heroes were Jerome Kern and Irving Berlin.

The brief Duet, Semi-Simple Variations, Partitions, Post-Partitions, and Tableaux-all produced between 1956

and 1973-exhibit the spirit of an explorer, but also the solid musical sense of a composer who knows the piano and how to use it to make his ideas not only forceful but attractive. Side two opens with the 1974 Reflections, the only work in which Babbitt combines a live piano with a synthesized tape. It is not "bloop-bleep music" but an imaginative utilization of a new technology. It is possible to regard the tape as a performing partner in a work whose musical character is served, but not determined. by that technology.

Taub has championed Babbitt's piano music for some time. Canonical Form, the longest of the nine works here, was composed for him three years ago under a Fromm Foundation/ISCM commission, and the latest, Lagniappe, was composed early last year especially for this recording, which represents its world première. The composer was present at the sessions, and he must be as pleased with the piano sound captured by recording engineer David Hancock as by Taub's splendid performances. Every aspect of the production is first-rate, and the documentation is quite exceptional, expanding upon the brief jacket notes in a handsomely designed booklet. Richard Freed

BABBITT: Three Compositions; Duet; Semi-Simple Variations; Partitions; Post-Partitions; Tableaux; Reflections; Canonical Form; Lagniappe. Robert Taub (piano). HARMONIA MUNDI HMC 5160 \$11.98, © 40.5160 \$11.98, © 90.5160 \$18.

persuasive performance in the Concert champetre-his sensible tempo for the final movement is especially convincing-but, like most other soloists in this work, he sounds rather overwhelmed. despite what seems to have been the most thoughtful effort toward balancing his harpsichord against the large orchestra. (It should be remembered that Wanda Landowska, for whom the work was composed, used a harpsichord made for her by Pleyel that was considerably more powerful than the more "authentic" instruments favored now.) In any event, Alain and conductor James Conlon are surely the most fetching team in the Organ Concerto, and the Compact Disc version is of demonstration quality.

The Concerto for Two Pianos, with its vivacious outer movements and its Mozartean middle one, is one of Poulenc's most ingratiating works in any form, and it is most attractively performed here. In the recording, however, the pianos are given a little too much prominence in relation to the orchestra, and the balance favors the piano even more in the Aubade and the solo Piano Concerto. This sort of thing may distress some listeners less than others. though, and there is no other recording of the Piano Concerto currently available. The convenience of having all three works for piano(s) and orchestra in such handsome performances and opulent sound, even if the balance is less than ideal, should make the Erato package pretty appealing-especially on CD, where the balance problem is less noticeable than on LP, and which is, of course, unmarred by the LP's side

TCHAIKOVSKY: The Seasons, Op. 37b; Humoresque, Op. 10, No. 2; Natha-Valse, Op. 51, No. 4; Polka de salon, Op. 9, No. 2; Mazurka de salon, Op. 9, No. 3. Ruth Laredo (piano). NONESUCH @ 79119-1 \$10.98, @ 79119-4 \$10.98, @ 79119-2 no list price.

Performance: Enchanting Recording: Excellent

Never mind that Tchaikovsky ought to have called his suite The Months instead of The Seasons. It is filled with charming and imaginative ideas, and I have never heard it make a stronger impression than in Ruth Laredo's irresistible performance, in which the full piquancy of each of the twelve pieces is realized to the full without any sentimentalizing. Of the filler pieces, the Humoresque and Natha-Valse are familiar both in their original form and from Stravinsky's use of them in The Fairy's Kiss, while the two little dances are delightful discoveries. Laredo plays all four, like the big work preceding them, with obvious relish and affection. and the sound throughout could hardly be better. All in all, this is an enchanting recording. RF

VERDI: Arias (see Collections-Aprile Millo)

Collections

SERGIO AND ODAIR ASSAD: Latin American Music for Two Guitars. Works by Piazzolla, Brouwer, Pascoal, Ginastera, and others. NONESUCH 79116-1 \$8.98, © 79116-4 \$8.98.

> Performance: Fluent Recording: Open

This collection of music for two guitars offers, as is often the case, unfamiliar composers and repertoire, making it all the more enjoyable. Ginastera was the only composer whose work I knew, but I would like to hear more music by the others. The pieces, all in twentieth-century neo-Classical style, are filled with inventive melodies and imaginative sounds, and the skillful performances by Sergio and Odair Assad are fiery, relaxed, lyrical, and animated in turn. The recording, produced by Robert Hurwitz and Kathryn King, is delightfully clean and filled with subtle details. At the same time, the producers have avoided the microscopic distortions of close miking and given the sound a spacious, live quality. Steve Birchall

JOSÉ CARRERAS: Canciones españolas. Falla: Seven Popular Spanish Songs. Mompou: Combat del somni. Ginastera: Canción al arbol del olvido. Turina: Poema en forma de canciones. And four others. José Carreras (tenor); Martin Katz (piano). PHILIPS @ 411 478-1 \$10.98, © 411 478-4 \$10.98, ® 411 478-2 no list price.

Performance: Very pleasing Recording: Good presence

José Carreras is shown to his best advantage in this collection of attractive Spanish songs. He meets the changes of pace and emotional content in the stylistically varied program with obvious ease and seeming pleasure. The material puts no stressful demands on his voice, which sounds rather like a light baritone here, and he appears to be very much at home musically. Particularly effective are a lullaby by Falla, Mompou's Combat del somni, and Of That Softest Hair by Fernando Obradors. All of the songs, however, are sung with a winning directness and unpretentiousness, complemented by Martin Katz's perceptive accompaniments. The recorded sound is clean and well balanced. R.A.

APRILE MILLO: Verdi Arias. Ernani: Ernani, involami. Il Trovatore: Tacea la notte placida. Macbeth: Una macchia è qui tuttora! La forza del destino: Pace. pace, mio Dio! Don Carlo: Tu che le vanità. Aida: Ritorna vincitor. And three others. Aprile Millo (soprano); London Philharmonic Orchestra, Giuseppe Patanè cond. ANGEL O DS-37356 \$11.98, @ 4DS-37356 \$11.98, @ CDC-47396 no list price.

Performance: Exciting Recording: Fine

Congratulations to Angel for making the first of Aprile Millo's commercial recordings. Not yet thirty, Millo is already heralded as "the new Verdi soprano," and well she may be. As this debut album of Verdi arias shows, her voice has something of Leontyne Price's golden warmth as well as something of Zinka Milanov's silvery ping to cut through heavy orchestration. Millo's interpretive powers, moreover, resemble Maria Callas's in her ability to convey identification with the characters she portrays. In short, she has everything going for her.

In "Ernani, involami" Millo displays a very agile coloratura, and "Tacea la embraces lovely pianissimo passages. "Morrò, ma prima in grazia" from Un ballo is well colored for dramatic effect, and Lady Macbeth's sleepwalking scene is hauntingly pathetic and eerie. Indeed, Millo brings individuality of execution and honest musical feeling to each of her nine selections.

Under the experienced and sympathetic hand of Guiseppe Patane, the London Philharmonic provides fine accompaniments. R.A.

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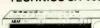
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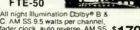
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EVERLY BROTHERS: Album Flash. Everly Brothers (vocals and instrumentals); instrumental accompaniment. You Make It Seem So Easy; The Story of Me; Following the Sun; On the Wings of a Nightingale. SONY R0191VH VHS Hi-Fi \$19.95, RO[91BE Beta Hi-Fi \$19.95.

Performance: In the pocket Recording: Varies

At the end of this video, Phil Everly says that he believes the fans of the Everly Brothers share a sense of having grown up together and of having made a good choice of music back in the Fifties-a music that has matured and endured. I suppose someone needed to say it, but it's something the viewer realizes within the first few moments of this engaging video, made up of recording-studio footage, concept-video singles, and interviews with Phil and Don and their producer, Dave Edmunds. This is something of a mini-documentary of the making of "EB '84," the duo's comeback LP, but it never gets too hip, or too gooey, or even too technical. It does confirm what you already thought-that offstage and without guitars in front of them. Phil is articulate, with an almost spiritual calm, and Don is restless and unsettled. It never does answer what we've always wanted to know: Why did they break up to begin with? But it's a captivating look through the keyhole, and a very nostalgic twenty-six minutes.

GAP BAND: Video Train. The Gap Band (vocals, instrumentals). Party Train: Early in the Morning: You Dropped a Bomb on Me; Burn Rubber (Why You Wanna Hurt Me); Jam the Motha. SONY R0193VH VHS Hi-Fi \$19.95, R0193BE Beta Hi-Fi \$19.95.

Performance: Comin' atcha Recording: Good

The Gap Band, a sort of ersatz Sly and the Family Stone, was one of the first black acts to realize the potential of music videos early in the decade. On this compilation of videos dating from 1982 to 1984 the band moves through two concept videos, one performance video, and two that try to be both. All five are well lighted and professional, but only Jam the Motha, an imaginative and surrealistic video in the Herbie Hancock mold, attempts anything out

CLASSIC CLASH

UNK rock, to paraphrase an observation about America, was a musical form that went from barbarism to decadence without ever passing through civilization, and the Clash, which for all intents was the punk-rock band, mirrored that process rather neatly. You can see that (and a lot more) in "This Is Video Clash," an anthology of the band's career in front of the cameras. A young band full of piss, vinegar, and righteous indignation turns before your eyes into a fagged-out, druggy bunch of ineffectual corporate rockers. It's absolutely fascinating (it took the Rolling Stones, for example, more than a decade to make the same transformation the Clash underwent in only a few years).

The cautionary aspect of it all notwithstanding, "Video Clash" is a genuinely exciting tape. At least before the rot set in, the Clash really was a great rock-and-roll band in the classic mold, and the camera loved them. The clips here are low-budget, nonconceptual affairs, except for the obviously storyboarded Rock the Casbah, which made the Clash MTV stars just prior to the bust-up, and they are extraordinarily gritty and evocative of their era.

For my money, the high points are the hypnotic reggae run-through of Bank Robber (with legendary producer Lee "Scratch" Perry hovering in the background) and London Calling, whose martial sentiments are perfectly caught as the boys lip-sync their hearts out on some scummy barge on the Thames. But with the possible exception of This Is Radio Clash, whose funk pretensions always seemed a little strained, there isn't anything here that won't get your juices flowing. Feisty,

combative, occasionally full of crap, and raw-edged in all the right ways, the Clash was one of the most interesting bands in all of rock's brief history, and here is its story in as danceable a package as we're ever likely to get. As an earlier bunch of punks in Detroit used to say, it's a killer. Louis Meredith

THE CLASH: This Is Video Clash. The Clash (vocals and instrumentals). Tommy Gun, London Calling, Bank Robber; Train in Vain; The Call Up; This Is Radio Clash; Rock the Casbah; Should I Stay or Should I Go. CBS/FOX 7098 VHS and Beta \$19.98.

of the ordinary. Lots of energy overall, but in the end this one's for Gap Band fans only.

B. B. KING: Live at Nick's. B. B. King (guitar, vocals); instrumental accompaniment. Every Day I Have the Blues; Love Me Tender; Sell My Monkey; The Thrill Is Gone; Inflation Blues; and four others. SONY R0194VH VHS Hi-Fi \$29.95, R0194BE Beta Hi-Fi \$29.95, R01948M 8mm \$29.95.

Performance: Substantial Recording: Excellent

I don't care for B. B. King's rendition here of the old Presley hit Love Me Tender—it just isn't his kind of song—and he sounds wobbly and uncomfortable with a dreadful number called There Must Be a Better World Somewhere. But the rest of "B. B. King Live at Nick's" is wonderful. Recorded three

years ago at Nick's Uptown in Dallas, King is backed by what is perhaps the house band, perhaps not—the cassette cover is uninformative, and the onehour tape itself gives no clue. The band sounds as if it were King's very own. Using a plunger, the unnamed trumpeter delivers a wonderful growling solo on Memphis Slim's Every Day I Have the Blues, the tenor saxophonist contributes a robust solo to Never Make Your Move Too Soon, the bassist gets his moment on Better Not Look Down, and everybody jumps on King's Sell My Monkey. It's King's show, of course, so he naturally occupies the limelight most of the time, and if his voice is beginning to show its age, his guitar playing is as vibrant as ever.

MONTEREY POP. The Mamas and the Papas: Creque Alley; California Dreamin'; Got a Feelin'. Janis Joplin:

Ball and Chain. Otis Redding: Shake; I've Been Loving You Too Long. The Who: My Generation. Ravi Shankar: Raga Bhimpalasi. Scott McKenzie: San Francisco. Simon and Garfunkel: 59th Street Bridge. And eight others. SONY R0162VH VHS Hi-Fi \$59.95, R0162BE Beta Hi-Fi \$59.95, R01628M 8mm \$59.95.

Performance: Historic mixture Recording: Very good

The 1967 Monterey Pop Festival was a milestone in the history of American popular music. It inspired Jann Wenner to launch his enormously successful Rolling Stone magazine. It boosted considerably the careers of such stars and acts as Janis Joplin, Jefferson Airplane, Jimi Hendrix, Canned Heat, and the Mamas and the Papas. And I would venture a guess that the sensational con-

burst that is outdone only by Hendrix's Wild Thing, an unmusical, grotesque ritual during which he sets his guitar on fire and smashes it. These repulsive performances are offset by the tuneful sounds of Simon and Garfunkel and three selections by the Mamas and the Papas, whose John Phillips co-produced the festival. On the emotional-yet-musical side is Otis Redding's I've Been Loving You Too Long, Janis Joplin's energy-charged Ball and Chain, and a stunning eighteen-minute display of musicianship and rhythmic intensity by Ravi Shankar and his group.

The technical quality is generally high, but there are some bad cuts in the audio, some of which seems to have been taken from other sources. Still, this remains a remarkable document of an event that helped redirect the course of American music.

Paul Young: an appealing voice and impeccable taste in material

tribution by Ravi Shankar did much to foster an appreciation for Indian music in this country.

The event also produced the first filmed document of a rock festival, a memorable seventy-two-minute page from the annals of American pop music that is now available on a Sony video-cassette. Already seen on television, the film contains all or part of eighteen selections by fourteen different acts, interspersed with footage designed to capture the milieu, much as Bert Stern's film Jazz on a Summer's Day did for the Newport Jazz Festival ten years before Monterey.

Intertwining glimpses of the era's flower children with the stage performances—which range from the sublime (Ravi Shankar) to the ugly (Jimi Hendrix)—"Monterey Pop" captures the essence of the day's pop scene, complete with rose petals, light show, and love signs. There is not much love, though, in the fury exhibited on stage by the Who and Jimi Hendrix. The Who's My Generation ends with a contemptuous assault on their instruments, an out-

HANK WILLIAMS, JR: A Star Spangled Country Party. Hank Williams, Jr. (vocals, guitar, piano); Waylon Jennings, Jessi Colter, Earl Thomas Conley, Gus Hardin (vocals); instrumental accompaniment. Honky Tonkin'; Texas Women; Good Hearted Woman; Luckenbach, Texas; The Conversation; Dixie on My Mind; and six others. PACIFIC ARTS 599 VHS Hi-Fi and Beta Hi-Fi \$29.95, 12-599 LaserDisc \$24.95.

Performance: Making waves Recording: Varies

What we have here is a video that tries to do too much—and darn near pulls it off. The idea was to put Hank Williams, Jr., on board the U.S.S. Constellation with 10,000 sailors and their guests and invite Earl Thomas Conley, Gus Hardin, and Waylon Jennings and his wife, Jessi Colter, to come along. You'd need at least ninety minutes to do that idea right, but, alas, we get only an hour, which means that Conley and Hardin are edited down to one song each, and what little is left for Waylon and Hank is further eaten up by the usual junk

shots of sailors going crazy, Hank and the ship's captain swapping ego awards, and even a quick tour of the ship. That plays havoc with the pacing, to say the least, but when the second half finally settles down, Williams proves that for all his hillbilly hype and Big Overgrown Kid bravado, he is a masterly showman—witty, full of black humor, and capable of creating bone-chilling mood. In fact, when he goes into a blues version of *The Ride/The Man of Steel*, young Bocephus is so affecting that you clean forget about the trip to the boiler room. Well, almost, anyway.

JOHNNY WINTER: Live. Johnny Winter (vocals, guitar); Jon Paris (bass, harmonica, vocals); Bobby Torello (drums). Jumpin' Jack Flash; Unseeing Eye; Highway 61 Revisited; Johnny B. Goode; Sweet Papa John; and four others. PIONEER PA-85-121 LaserDisc \$19.95.

Performance: Good Recording: Dull

Johnny Winter appeared on the national scene in the late Sixties and made his last notable albums in the early Seventies. "Johnny Winter Live," taped at Toronto's Massey Hall in 1983, proves that he's still a fine blues guitarist, but the music is never so exciting that you can overlook how boring the show is visually. With the exception of two brief inserts, in which Winter makes some rather uninteresting remarks, the video consists entirely of concert footageforty-eight minutes of dimly lit, relatively unanimated performers captured with all the finesse of a local news crew. Here is a case where an audio release would not only have sufficed; it would have been preferable.

PAUL YOUNG: The Video Singles. Paul Young (vocals); other musicians. Come Back and Stay; Everytime You Go Away; I'm Gonna Tear Your Playhouse Down; and two others. CBS/FOX 347094 VHS Hi-Fi \$19.98, 247094 Beta Hi-Fi \$19.98.

Performance: Likable Recording: Very good

In a lot of ways Paul Young is a sort of Eighties English version of Boz Scaggs. He's a guy who genuinely loves black music and has an appealing voice and impeccable taste in material, all of which calls to mind Olivier's advice about acting: when you can fake sincerity, you're almost all the way home. This collection of Young's video hitsmostly lip-synced concert clips that give him many opportunities to perform athletically with his microphone stand—features the singer faking sincerity with almost breathtaking aplomb, which already puts him leagues beyond such cosmic bores as the Thompson Twins. And since he is also goofily endearing, and since the production on his records is as superficially gorgeous as you'll find these days, I'm not disposed to quibble. L.M.

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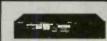
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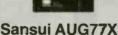
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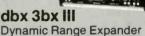


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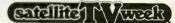
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by Christie Barter & Steve Simels

MERICAN audio manufacturers may keep struggling to meet competition from the Japanese, but recording classical music—even for American labels—has become largely a European business. Angel Records, headquartered in Los Angeles, has teamed up with



Millo at the Met: raves

CHRISTIAN STEINER/ANGEL

the Ambassador Foundation, of Pasadena, California, for a series of debut recordings by young American artists of exceptional promise. The first is New York-born soprano Aprile Millo, whose debut album, a recital of Verdi arias, is reviewed in this issue. It was recorded with the London Philharmonic Orchestra in England.

Millo is thrilled that her first record is on Angel, a label associated with many great singers of the past, such as Elisabeth Schwarzkopf, Kirsten Flagstad, and Maria Callas. She says, "Verdi is my best friend at the moment. Not only is his music like medicine for my voice, but there's a magical, mythical something in his work that makes me feel released. In the future I look forward to Wagner and Rossini, and ultimately to Bellini's Norma-but not until I earn the

Millo has gotten rave re-

views for her performances at the Metropolitan Opera. Asked for suggestions for young singers who are not as far along as she is, she advises them to work hard and to "try to be worthy of the art form."

HEY'RE cute, they're Brits, they're Bananarama! More important, these three fun gals, who in the past have favored us with such pop confections as Cruei Summer and Robert DeNiro's Waiting, have just released a new single that ties in neatly with the European theme of this issue. Handily enough, it's a cover version of the 1970 hit Venus, a Pinball Wizard ripoff originally recorded by a Dutch pop group, Shocking Blue. The Ban's version on London Records is similar in style to recent efforts by Dead Or Alive, and the gratitude of a struggling writer is extended to the lasses for reviving one of the few important pre-Eighties Europop hits in time for Steve Simels's article on page 92.

N connection with its annual fund-raising marathon this spring, the Chicago Symphony issued a tworecord album of performances conducted by Fritz Reiner during the 1957-1958 season. Never before released, they include Berlioz's Benvenuto Cellini Overture, Vaughan Williams's Tallis Fantasia, Schoenberg's Transfigured Night, Wagner's Rienzi Overture, and Schumann's Second Symphony. The album is still available, according to the orchestra, for a \$35



Bananarama: a new generation of Europop

contribution and can be ordered from Reiner Record, Chicago Symphony Marathon, 310 S. Michigan Ave., Chicago, IL 60604. Add \$3 for postage and handling.

A LTO saxophonist Ornette Coleman, the ageless jazz revolutionary, recently



Metheny and Coleman

played an SRO date at New York's Town Hall in the company of the younger (and generally more commercial) fusion guitar player Pat Metheny. They may be the unlikeliest jazz duo in recent memory, but that hasn't hindered sales of "Song X," their new album for Geffen, and people who saw the show report that the collision of styles made for unusually interesting music.

ROCK-AND-ROLL JOKE OF THE MONTH: Q—Where do cantaloupes go for the summer? A—John Cougar Mellencamp.

Mellencamp recently performed a rare solo acoustic set on behalf of beleaguered farmers in Chillicothe, Missouri (not the rock capital of the United States, but what the heck). He reportedly was tuckered out after staging this sequel to last year's Farm Aid benefit concert but is said to be working up new songs for a sequel to his Multi-Platinum "Scarecrow" album. No word, however, on when it's scheduled to be released.

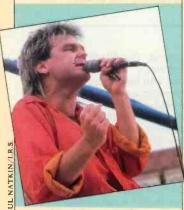
ANS of British post-punk rabble rousers the Alarm and lead singer Mike Peters will be pleased to learn that the group's recent fifteennation television concert is about to be immortalized for home video. A cassette of the concert, in which the band performed in front of 18,000 like-minded young people at UCLA, will be available momentarily as the first release of the fledgling I.R.S. Home Entertainment label, distributed by MCA. As a consumer note, however, we pass along



BET ROBERTS

this comment by one of our spies at a recent Alarm show in Manhattan. Asked to assess the group, she replied, "Just four guys with scary haircuts."

THE professional break-through for the young Finnish conductor Esa-Pekka Salonen came in September 1983 when he was asked, on only a few days' notice, to lead the Philharmonia Orchestra of London in Mahler's sprawling Third Symphony. He claims he barely knew the score at the time, but apparently his performance satisfied a sufficient number of critical ears to boost him into the big time. Invitations for guest conduct-



Peters of the Alarm

ing engagements poured in from orchestras on both sides of the Atlantic.

Only last year Salonen, still in his twenties, was made principal guest conductor of the Philharmonia, and shortly thereafter he signed an "exclusive, multi-record, longterm contract" with CBS Masterworks.

His first recording under this contract was Carl Nielsen's Fourth Symphony, which he recorded with the Swedish Radio Symphony (of which he's the principal conductor). He followed it up by flying thousands of miles to the U.S. West Coast to record Lutoslawski's Third Symphony with the Los Angeles Philharmonic. Both recordings are reviewed in this issue.

With the Philharmonia Salonen has recorded Olivier Messiaen's massive Turangalila Symphony and a couple of jazz-tinged trumpet concertos by Andre Jolivet and Henri Tomasi, featuring Wynton Marsalis as the soloist.

F you are not yet aware of a noticeable increase this year in radio and TV programming of Canadian music, in performances by Canadian musicians, you un-doubtedly will be. This year has been declared the International Year of Canadian Music, and it is being observed with an extensive program of concerts, recordings, and special radio and television performances devoted to music by Canadian composers. Many of these broadcasts are being or will be carried locally in the U.S. during

"What we're celebrating in 1986," says contralto Maureen Forrester, who is chairperson of the International Year, "is the vitality of music in Canada."

Another eminent Canadian tenor Jon Vickers, has done his part with a recording of songs by seven contemporary Canadian composers on the Centrediscs label, a Canadian Music Centre subsidiary

Centrediscs is also producing three new Compact Discs featuring various Canadian orchestras performing Canadian repertoire. For further information on these recordings, along with others the company has produced over the past few years, write Centrediscs at 20 St. Joseph St., Toronto, Ont. M4Y 1J9. Or telephone 1-416-961-6601. []

Salonen: the big time





Vickers: eminent Canadian

NINETY-MINUTE film A portrait of Billie Holiday, among the best known of all American jazz singers, is scheduled to be shown on PBS stations on August 4 as part of the network's American Masters series. Appropriately called The Long Night of Lady Day, the documentary traces Holiday's life from her difficult early childhood through her first dates with Benny Goodman, Teddy Wilson, and Count Basie in the mid-Thirties. Filmed excerpts from some of her later television appearances include footage from a CBS special in which she's surrounded by a virtual pantheon of jazz musicians, among them the saxophonists Coleman Hawkins, Lester Young, Ben Webster, and Gerry Mulligan. Holiday died in New York in 1959 at the age of forty-four.

American Masters continues on August 11 with a program devoted to "the life in music" of conductor James Levine, artistic director of the Metropolitan Opera, and on August 18 with a documentary salute to composer Aaron Copland, who celebrates his eighty-sixth birthday in November.

HE Royal Philharmonic, based in London, has launched its own record label, RPO Records, with the aims of making records by artists who are closely associated with the orchestra and of giving its musicians a share in the profits.

The first RPO release includes an album of Handel suites conducted by the Philharmonic's president and associate conductor, Sir Yehudi

Menuhin, and a coupling of Walton's oratorio Belshazzar's Feast with the suite drawn from his music for the film Henry V conducted by the orchestra's music director, André Previn.

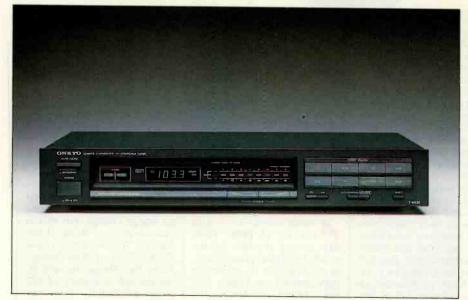
RACENOTES: Hard to be-Glieve, but squeaky-clean ex-teen idol Donny Osmond was spotted recently with heavy-metal mavens Blue Öyster Cult at an all-star celebrity bash at a biker club in California. We've heard that Osmond was contemplating an image change, but this is ridiculous. . . . Book of the Month: 'Til the Cows Come Home: Rock 'n' Roll Nebraska by Bart Becker is, incredibly enough, a history of 892 Nebraska bands, from the Addicts to the Zarfs, with bios and discographies-and pictures along the way-of such near-celebrities as Zager and Evans, the Eagles' Randy Meisner, and Buddy Miles.



Holiday: American master

You can get a copy for \$15 from Real Gone, P.O. Box 17314, Seattle, WA 98107.
The new Run-D.M.C. album "Raising Hell," on Profile Records, has just become the first rap LP ever to ship Gold. . . . Singer and occasional ("No Nukes") activist James Taylor on why he wasn't involved in Live Aid or Farm Aid: "Nobody called me.". . Don't forget to check out Bill Cosby's new Geffen album, "Those of You with or Without Children, You'll Understand."

STEREO REVIEW AUGUST 1986 133



Onkyo

Sixteen AM and FM stations can be programmed into the memory presets of Onkyo's T-4038 quartz-synthesis tuner. Because the power system for the memory is charged each time the tuner is switched on, the programmed stations are retained in memory for several weeks if the tuner is unplugged. Scan tuning automatically searches for the next receivable station in either direction. The frequency of the tuned station is shown by a digital display. To compensate for weak or noisy reception, an automatic FM high-blend circuit reduces stereo separation.

Total harmonic distortion for the T-4038 is given as 0.1 percent in mono and 0.2 percent in stereo. Selectivity is rated as 55 dB (DIN) and usable FM sensitivity as 11.2 dBf (IHF). Price: \$159.95. Onkyo, Dept. SR, 200 Williams Dr., Ramsey, NJ 07446.



Bose

The 8-inch woofer at the top of the floor-standing Bose 601 Series III speaker is surrounded by four 3-inch tweeters pointing in different directions. A second 8-inch woofer is mounted on the front. The long-excursion woofers are housed in separate enclosures that vent into the main cabinet and out through a slot port in the rear. Each port is tuned to extend bass response while selectively controlling frequencies that can be distorted by room boundaries. Sound radiates from the top, front, and back of the system so that listeners receive both direct and

reflected sound. The 601 Series III uses a dual-frequency crossover network, and the low- and high-frequency drivers operate together over nearly a full octave. The gradual rolloff slopes are said to minimize phase shift and coloration in the crossover region.

The Bose 601 Series III, finished in walnut veneer, measures 12½6 inches wide, 12½ inches deep, and 30 inches high. Bose recommends that the speakers be used with amplifiers delivering at least 10 watts and a maximum of 200 watts per channel. Price: \$1,026 per pair. Bose, Dept. SR, 100 The Mountain Rd., Framingham, MA 01701.

Circle 127 on reader service card

Akai

The VS-565U VHS Hi-Fi videocassette recorder from Akai has a built-in 10-watt-per-channel amplifier, allowing a pair of speakers to be connected directly to jacks in the rear of the unit. An MTS decoder allows reception of

AKAI

stereo TV broadcasts. For better picture quality and special effects, the VCR has four video heads and VHS HQ signal-processing circuitry.

By following on-screen instructions and using the wireless remote control. users can program the VS-565U to record six events over two weeks. The remote also permits direct channel selection and volume adjustments. The VCR can tune 107 cable channels and has 32 presets. A security system can prevent use by children. Specifications for the VHS Hi-Fi soundtrack include a dynamic range greater than 80 dB. Horizontal video resolution is greater than 340 lines. Price: \$880, including remote control. Akai America, Dept. SR, 800 West Artesia Blvd., P.O. Box 6010, Compton, CA 90224.

Circle 128 on reader service card



Rabbit Systems

The VCR-Rabbit from Rabbit Systems transmits audio/video signals from a single video source through a slender wire to as many as five television sets. It is said to deliver a clear signal as far as 300 feet. A transmitter module is connected to the video source, and thin, thread-like wires carry its output to receiver modules hooked up to each TV.

If the video source has an infrared remote control, its commands can be transmitted to the unit through any of the VCR-Rabbit receiver modules. The VCR-Rabbit can also transmit cable-TV signals throughout a house from a single cable hookup; channels can be individually selected on each TV. Price of one transmitter, one receiver, and connecting wire: \$89.95. Each additional receiver is \$44.95. Rabbit Systems, Dept. SR, 233 Wilshire Blvd., Santa Monica, CA 90401.

Circle 129 on reader service card

EPI

The Video Concert System 2000 from EPI is a wooden audio-video cabinet with built-in three-way speakers. A 6-inch woofer is mounted face down at the bottom of each speaker enclosure for a slot-loading effect said to increase low-bass output. A 1-inch tweeter and a 4-inch midrange are mounted in the top front corners of each enclosure.

The VCS2000 has three adjustable shelves for components, tapes, and accessories, and a television set can be placed on top. Magnetic shielding protects nearby video screens from the color distortion that can be caused by the fields around speaker elements.

Frequency response of the speakers is given as 45 to 20,000 Hz ±3 dB. The crossover frequencies are 200 and 2,000 Hz. Rated sensitivity is a sound-pressure level of 88 dB at 1 meter from the cabinet with a 1-watt input. The system is recommended for use with amplifiers



delivering from 10 to 100 watts. The cabinet is finished in simulated darkoak, light-oak, or black-ash woodgrain vinyl. Price: \$369.95 to \$399.95 depending on finish. Epicure Products, Dept. SR, Newburyport, MA 01950. Circle 130 on reader service card

Bang & Olufsen

The 51/2-pound subchassis of Bang & Olufsen's belt-driven Beogram RX2 turntable is suspended from three pendulums to resist vibration and acoustic feedback. Its straight tonearm is designed for low distortion at all points on an LP as well as minimal resonance and record wear. The arm's resonance is given as 14 Hz in the vertical plane and 12 Hz in the horizontal-higher than the frequency of record warps but below audible frequencies. The two speeds, 331/3 or 45 rpm, are manually selected. Other controls start and stop the turntable and cue the tonearm. Price: \$199.

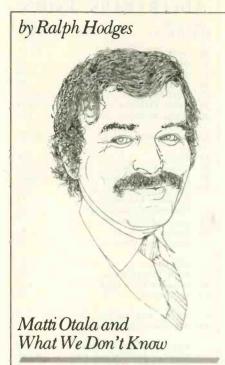


Bang & Olufsen, Dept. SR, 1150 Feehanville Dr., Mt. Prospect, IL 60056. Circle 131 on reader service card

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AUGUST



T was in the early Seventies. when most critics of "transistor sound" had decided the cause was lost, that Dr. Matti Otala, a professor of electronics at the University of Oulu in Finland, sprang upon the scene with intimations of an unheralded distortion mechanism. That is, he found an unanticipated way in which an amplifier can sound bad-thereby giving new life to the tube-transistor controversy.

I don't think that Otala, in his presentation of the theory of transient intermodulation distortion, or TIM, had anything like the abolition of transistors in mind. He did, certainly, have gripes about the use of large amounts of negative feedback (inconvenient with tubes, but readily possible and sometimes necessary with transistors) to turn a fundamentally bad amplifier into something that measures like a good one. And he was ready and willing to apply his own brand of Aristotelian logic to amplifier design. Allow me to paraphrase his argument: "If some people like amplifier A but don't like amplifier B, and if we proceed on the assumption that they're not cranks, then it's logical to work on identifying and isolating the differences between A and B, whatever they may be, until we hit on the one that resolves the problem. It's illogical to continue trying to sell them amplifier B, because they know what they want, and we don't. In fact, we actually know very little." Very little about the way people perceive sound, that is.

It's fortunate that Otala is not merely an armchair philosopher. His practical work on all-transistorized electronics for Harman Kardon frequently brings reactions of surprise from reviewers, and his tutelage has changed the face of amplifier design worldwide. You would not be reading so much about lownegative-feedback and high-current designs if it were not for Matti Otala.

Since Otala ruffled so many feathers with his original claims, I decided to check in with him to see where his philosophy had taken him and what he was working on now.

"Well, pretty much more of the same thing," he said. "We haven't come close to getting where we'd

like to be yet.

"When I started designing amplifiers (tube devices in 1953, transistorized in 1963), I came up against the same interesting problem that was baffling many others at the time, that amplifiers with the worst measured distortion-static THD and IM distortion-all too often had a better sound quality. As progress was made during investigations into dynamic distortions-not just in promulgating the theories of such distortions but in devising practical, revealing measurement methods for them—we began to learn a bit about what had been overlooked previously, and the improvements in sound quality were gratifying. But we are still farther from perfection than many people realize.

"We still have many disputes in which audiophiles claim to hear plainly audible differences in equipment, but engineers, myself included, cannot find anything measurable to account for them. Yet based upon my experience, I tend to side with the 'golden ears' and suspect that sooner or later we'll find reasons and methods to measure what we can't fathom right now. With all that has been discovered during the past ten years, there's no reason to believe the list of significant problems has been exhausted."

Otala has done much recent, provocative work on the loudspeakeramplifier interface, and I asked him to summarize his findings.

"The problem is that our usual assumptions about speaker-system impedances are unrealistic, and the reasons are several. The argument that a speaker is not a simple resistor-that actual speaker impedances can vary from 2 to 60 ohms, and phase angles from +60 to -60degrees-is well known. It remains significant, however. In recent measurements we have found that many '100-watt' amplifiers can put out only a couple of watts into a 2ohm, +60-degree load.

"As we've learned more about all this, high-current amplifiers have come somewhat into vogue. But this doesn't mean we know terribly much about the right way to design a high-current amplifier. All we really know is that it must be the responsibility of the amplifier to cope with the peculiarities of the speaker load, since it's much easier to increase the current reserves of an amplifier than to design a sonically good speaker system with wellbehaved impedance."

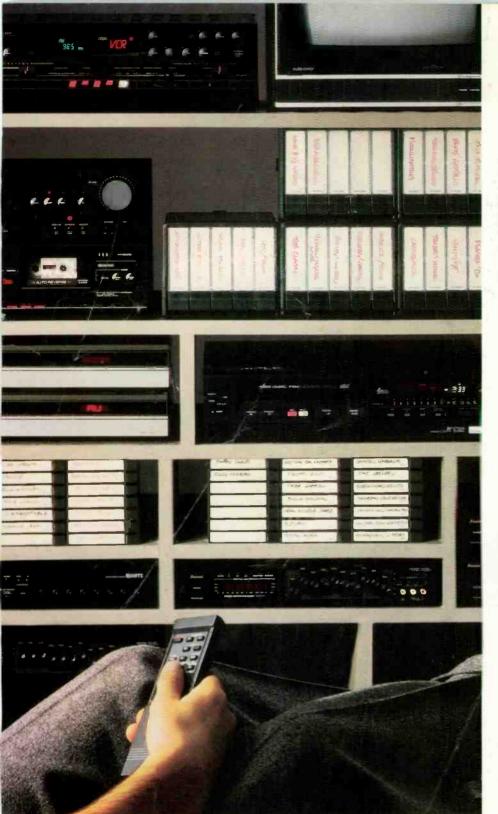
What, I wondered, are the implications for amplifier power-supply design, which is critical to current reserve? Power supplies are already tending to the awkwardly bulky and expensive. Could the so-called signal-tracking techniques help us out

materially?

"Well, I'm not at all convinced that they would," Otala told me, "except possibly at frequencies below about I kHz. Above that, I suspect the tracking could not respond fast enough to prevent subtle faults exhibited by marginal power supplies, if not actual clipping. One thing that might save us would be a truly immaculate delay line put into the signal path before the output stage, which would hold the signal back long enough to give the supply a chance to preview it and come up to strength. However, we don't have such a delay line."

At this point my last quarter fell into the telephone's coin box, and I decided to bring things to an end. I still didn't know quite what Matti Otala is going to be up to next, but it's possible that he doesn't quite know either.





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