THE ANTI-TAPING CHIP
WHY MUSICIANS AND AUDIOPHILES BOTH loose

SPECIAL REPORT

The proposal to prevent taping of prerecorded or broadcast music by mandating the use of CBS's anticopy chip has pitted audio enthusiasts against musicians. In an exclusive report, High Fidelity Technical Editor David Ranada shows that the anticopying system will harm both the creators and the consumers of music.
World class automobiles are engineered to a set of uncompromising standards, criteria which also distinguish our new DIN-chassis car audio series.

Each is built from a commitment to musical excellence made 100 years ago. The same commitment that has made Yamaha the world's largest manufacturer of musical instruments—from concert grand pianos to FM digital synthesizers.

We've also drawn on our extensive experience in professional audio equipment used in concert halls and recording studios worldwide. And incorporated features from our state-of-the-art home audio components.

One such feature is our unique Variable Loudness Control. First developed for home receivers and amplifiers, it ensures that low, mid and high frequencies maintain proper tonal proportion at any volume. So the sound is always well balanced.

Every unit has our new rotary head design for superb bi-azimuth control, creating greater dynamic range and full-frequency response in either tape direction. Our improved MR II tuner circuitry automatically controls FM noise to optimize reception of even the weakest signal. And our top models offer an optional theft-proof removable chassis.

Visit any authorized Yamaha Car Audio dealer today and listen to our full line of DIN-chassis products. Your precision-engineered automobile deserves nothing less.

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

YAMAHA

1887-1987
100 Year
A Century of Quality
Even in a world that has come to expect the unexpected from Sony, our latest achievement is nothing short of astounding. A complete car compact disc system, with AM/FM tuner, 25-watt RMS per channel amplifier, and optional cassette deck that installs easily into the existing space in your dash. That means no awkward brackets, no sacrificing cassette deck for CD and no having to mix and match components. But that’s only half the story.

Even if you could figure out how Sony put a CD player, AM/FM tuner, amp and cassette deck in this space...

you’d still have to hear it to believe it.
SONIC HOLOGRAPHY transforms exciting new program sources as well as familiar old ones into truly lifelike experiences.

When Bob Carver set out to redefine the stereo listening experience through Sonic Holography, he was really rebelling against the limitations of the stereo phonograph record. At the time his remarkable invention first started astounding audio critics and music lovers, vinyl discs were the musical standard.

If Sonic Holography can breathe life into even your oldest records, imagine what it will do for CD's, VHS Hi-Fi and other exciting new stereo sources.

Now there are at least five major audio/video breakthroughs which further expand Sonic Holography’s potential to bring more excitement and realism into your life. These innovations include the Compact Audio Disc, noise-free stereo FM, AM Stereo, stereo television broadcasts and stereo Hi-Fi video formats.

Each provides the Sonic Hologram Generator in selected Carver preamplifiers and receivers with a chance to redefine the width, breadth and depth of the traditional stereo sound field – while using your existing speakers.

WHAT SONIC HOLOGRAPHY DOES.

Watch a 13” black and white TV. Now see a movie in 70 millimeter. Listen to your favorite musicians on a transistor radio. Now sit three rows back from the stage at a live concert.

These are not exaggerations of how much more dimensional and realistic Sonic Holography is than conventional stereo. The most experienced and knowledgeable experts in the audio industry have concurred. Julian Hirsch wrote in Stereo Review, “...it seems to open a curtain and reveal a deployment of musical forces extending behind, between and beyond the speakers.” According to Larry Klein of Stereo Review, “It brings the listener substantially closer to that elusive sonic illusion of being in the presence of a live performance.”

HOW SONIC HOLOGRAPHY WORKS.

When a musician plays a note, the sound occurrence arrives separately at your left and right ears. Your brain analyzes the difference in these sound arrivals and tells you exactly where the sound is.

Conventional stereo tries to duplicate this process by using two speakers to send a different version of the same sound occurrence to each ear. In theory, this should “trick” your brain’s psychoacoustic center into placing the musician on a limited sound stage between your speakers. If — and only if — each speaker can be only heard by one ear.

L. Real-life sonic event results in two sound arrivals: one at your left ear and one at your right ear.
R. Stereo playback of that sonic event results in four sound arrivals. Two per speaker per ear — four.

The problem is, these different versions of the same sound also cross in the middle of your listening room, so left and right ears get both left and right sound arrivals a split second apart. Stereo imaging and separation are reduced because both speakers are heard by both ears, confusing your spatial perception. The Sonic Hologram Generator in the Carver 4000t, C-9, C-1 and Carver Receiver 2000
"The World's Best Sounding Car Speakers From the Genius of Matthew Polk"

Two of Polk's newest polymer technology two piece, three way systems: The 6-1/2" 6502 (99.95 ea.) and the 5-1/4" 5502 (99.95 ea.)

Polk Mobile Monitor Voted Speaker of the Year 1987

This year industry professionals voted Matthew Polk's MM X (MM 10 6-1/2" two way system — 99.95 ea.) Speaker of the Year in the prestigious Audio Video International Auto Sound Grand Prix. Now the Grand Prix winning MM X is joined by a new generation of high power, three-way polymer technology Mobile Monitors. They are engineered in Matthew Polk's uncompromising tradition of superior sound quality and unequalled value. We are "The Speaker Specialists". No other loudspeakers will give you the unequalled musical pleasure of a pair of Polks. In car speakers, as in home speakers, if you want the best possible sound, listen to the experts and buy Polk Audio.

Polk's state-of-the-art 3 way 6" x 9 6502 (99.95 ea.) also incorporates polymer technology for superior sound.

polk audio
The Speaker Specialists®

5601 Metro Drive, Baltimore, Md. 21225
THE EVOLUTION OF THE DISC.

AND THE DISCWASHER.

Early records were scratchy and extremely fragile. Now, with compact discs, you can program the cuts you want to hear (in the order you want to hear them), sit back, relax, and enjoy hours of uninterrupted pleasure. We've certainly come a long way.

Discwasher has come quite a distance, too. And though our first product (the famous D4+ Record Cleaning System) is still the industry standard for cleaning LP's, our new Discwasher Compact Disc Cleaner has a style and design that's more than equal to the remarkable discs it protects.

For starters, our CD Cleaner uses a computer-aided design to deliver a true "radial" cleaning (that's what the manufacturers recommend). And Discwasher's CD-1 Cleaning Fluid is scientifically formulated to lift and suspend contaminants as our non-abrasive cleaning pad easily and safely removes the debris from the disc surface. The result is no audio drop-outs or playback skips to mar your enjoyment.

Best of all, both Discwasher's CD and LP Cleaning Systems are serious equipment—at a reasonable price. Good "insurance" to protect your priceless CDs and albums. Just the latest step in an exciting audio evolution.

discwasher

A Division of International Jensen Inc

The makers of the famous D4+ Record Cleaning System.
There's something for everybody in this month's test reports. The Shure D-6800 Compact Disc player spins 'em at home, while Alpine's first in-dash car tuner, the 7902, spins 'em on the road. Soundcraftsmen and Sony show their muscle with, respectively, the Pro-Power Four power amp and the TA-1700ES integrated. Acoustic Research sounds off with its TSW-410 loudspeaker system, and the big picture is provided by Proton's VT-210 color monitor/Receiver. Reports follow.
Introducing the Visionary New CLD-1010 LaserVision Discs, Compact Discs, Plus 5-inch CD Videos

Our new CLD-1010 is the first invention on earth capable of playing every audio and video laser format in existence. Which means the CLD-1010 opens up your home to a vast array of entertainment software. Select from a huge library of over 2000 LaserVision titles, from the latest movies to opera, many with breathtaking digital soundtracks. The new 5-inch CD Videos. Compact discs. And the growing catalog of 8-inch music LaserDiscs as well.

The CLD-1010's remarkable capabilities are made possible by Pioneer innovations like our super-fine half-micron laser optical reader and advanced high-precision servomechanisms and electronics. You get brilliant, high-resolution, 400-line true-color pictures, 60% sharper than any VHS-HQ on the market.

The CLD-1010 markedly reduces picture noise by "piggybacking" the RF video amplifier on the laser pickup assembly to shorten the signal path. Color "jitter" is eliminated with a CCD time-base corrector and spindle servo system. A new Feed-Forward Color Corrector maintains color accuracy, and an IC Video Detector along with Pioneer's exclusive Noise Canceller further reduces picture distortion and video noise.

Digital source materials are decoded by a 2x Oversampling Digital Filter to reduce phase distortion and deliver crisp, clear dynamic sound. And our three-spot beam linear servo system ignores dust, dirt and scratches on CD's for improved reproduction.

The front-loading CLD-1010 comes complete with extensive programming capabilities, between-track pausing, backward/forward scanning, skip, search, still/step, and more. A full-function remote complements front panel operation of basic controls. And unlike videotape, you can access any point on a LaserVision disc as fast as lightning.

The Pioneer CLD-1010 is years ahead of its time. But why wait till the 21st Century to enjoy 21st Century home entertainment? It's all here, right now, at your Pioneer Dealer today. For more information, call 1-800-421-1404.
Revolutionary.

PIONEER®
CATCH THE SPIRIT OF A TRUE PIONEER.
**Shure D-6000 Compact Disc Player**

**FREQUENCY RESPONSE WITHOUT DE-EMPHASIS**

<table>
<thead>
<tr>
<th>DB</th>
<th>-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hz</td>
<td>20</td>
</tr>
<tr>
<td>left channel</td>
<td>+0.0</td>
</tr>
<tr>
<td>right channel</td>
<td>+0.0</td>
</tr>
</tbody>
</table>

**FREQUENCY RESPONSE WITH DE-EMPHASIS**

<table>
<thead>
<tr>
<th>DB</th>
<th>-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hz</td>
<td>20</td>
</tr>
<tr>
<td>left channel</td>
<td>±0.2 dB, 20 Hz to 20 kHz</td>
</tr>
<tr>
<td>right channel</td>
<td>±0.2 dB, 20 Hz to 20 kHz</td>
</tr>
</tbody>
</table>

**CHANNEL SEPARATION (at 1 kHz)**

100 dB

**CHANNEL BALANCE (at 1 kHz)**

±0.2 dB

**S/N RATIO (re 0 dB; A-weighted)**

- 100 dB without de-emphasis
- 104 dB with de-emphasis

**DIMENSIONS**

17 BY 3 INCHES (FRONT PANEL), 121/2 INCHES DEEP PLUS CLEARANCE FOR CONNECTIONS. PRICE, $529; WARRANTY, "LIMITED," ONE YEAR PARTS AND LABOR, FIVE YEARS ON LASER IN HOME USE.

**EQUIPMENT REPORTS ARE BASED ON LABORATORY MEASUREMENTS AND CONTROLLED LISTENING TESTS. UNLESS OTHERWISE NOTED, TESTING DATA ARE PROVIDED BY DIVERSIFIED SCIENCE LABORATORIES. MANUFACTURERS ARE NOT PERMITTED TO READ REPORTS IN ADVANCE OF PUBLICATION AND NO REPORT OR PORTION THEREOF MAY BE REPRODUCED FOR ANY PURPOSE OR IN ANY FORM WITHOUT WRITTEN PERMISSION OF THE PUBLISHER. REPORTS SHOULD BE CONSTRUED AS APPLYING TO THE SPECIFIC SAMPLES TESTED; HIGH FIDELITY AND DIVERSIFIED SCIENCE LABORATORIES ASSUME NO RESPONSIBILITY FOR PRODUCT PERFORMANCE OR QUALITY.**

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**TEST REPORTS**

**Shure D-6000 Compact Disc Player**

If you think of Shure as a company that has been dragged kicking and screaming into the CD age, think again. For decades, this manufacturer of cartridges for playing analog LPs has been making a wealth of non-cartridge audio products, many of them for professional rather than consumer use. It hasn't been that big a step from microphones, mixers and equalizers to its recent range of home surround-sound processors and CD players. So it comes as no shock that, in the D-6000, this longtime guru of the black-vinyl nirvana shows a decided aptitude for the new silvery medium.

The organization of the front panel follows standard lines. The power switch is near the left of the disc drawer, the open/close button at its right. Along the right button, under the readout window, are the main controls: stop/clear, forward and reverse scan, forward and reverse cueing ("skip"). To their right are three more buttons. One enables or defeats the memory function, one chooses beginning and end points for segment repeat, and the last is a memory button for programmed playback. At the extreme right are an output level control, which adjusts one of two back-panel output-jack pairs as well as the headphone level, and the headphone jack itself.

With the exception of the main power switch, all of these controls—including the volume adjustment—are repeated on the supplied wireless infrared remote control, which runs on a pair of AA cells. The remote also incorporates a numeric keypad so you can choose tracks directly by number, either to begin play or for programming. (If you use only the front-panel controls, you must cue one track at a time with the skip buttons.) The keypad organization is a little unusual in that its ten regular buttons (0 to 9) refer only to the "ones" column; for digits in the tens, you use a button marked "+ 10." For example, to program Track 24, you press +10 twice, then 4.

During play, the readout displays minutes and seconds of elapsed time plus the track and index numbers of the passage presently playing. During memorization, the time display is preempted by the number within the programmed sequence. (You can't program by index number, by the way.)

When you first close the drawer, total time on the disc is shown for a moment in this
same space. The only other readouts are for status of repeat, memory, and so on. There are the usual three repeat modes: the full disc, the segment between start and stop cues, or a programmed sequence of tracks.

Incidentally, Shure makes the point that you can program the player even before you've closed the disc drawer, so you can use the disc label as a reference. In most cases, the jewel-case liner is a better reference, but the feature should prove useful under some circumstances, particularly as CD prices become more competitive and the packaging consequently chintzier and less informative. And while we're on that subject, the rather plain-Jane owner's manual for the D-6000 is more informative than most, thanks largely to the simple, direct, idiomatic English in which it is written.

The best setup for the D-6000 will depend on how you want your overall system to work. You can use the remote volume control to adjust speaker level from your armchair if you feed the rest of the system from the player's adjustable outputs. If the system itself has a remote volume adjustment, however, you're better off using the D-6000's fixed outputs and saving its volume adjustment for the headphones. There is a subcode output on the back panel to permit direct hookup for that feature—if and when it's implemented by CD makers for texts or other visual supplements to the digital audio.

The 6000's digital-to-analog conversion section uses oversampling plus a combination of digital and analog filtering. As a result, the inaudible "ringing" that can be seen in the pulse and square-wave traces from Diversified Science Laboratories is almost symmetrical: That is, there's almost as much in advance of the triggering transient as there is following it. (In the real-time world of analog signals, an effect can't precede its cause.) Pulse polarity is positive—the normal condition. Many players reverse polarity, though the audible importance of this remains debatable.

The digital filtering permits very flat response right up to 20 kHz. Though it's splitting hairs too fine to show clearly on our graphs, the curves for response without preemphasis have a tiny rise (less than 0.1 dB) over a broad range centered on about 10 kHz and are down not quite $\frac{1}{4}$ dB at 20 kHz. Those made with pre-emphasis lie slightly higher, rising close to $\frac{1}{4}$ dB—even as low as 5 kHz—and dropping off a hair less at the extreme top.

All the data, in fact, represent excellent performance. Look as hard as you may, you won't find significantly better figures for any characteristic in any other model at any price. The error-correction and concealment tests were passed perfectly (as they are by most models we test these days, but not by at least one high-price entry), though the D-6000 is fairly sensitive to external vibration in the vertical plane. Tapping on the top of the case easily caused mistracking, but footfalls never disturbed it during our tests. And we discovered no evidence of speaker feedback.

During some tests, we discerned (or thought we discerned) an indelible something extra: that elusive and highly subjective "musicality" evoked by some models. Notwithstanding that undocumented consideration, there's no doubting the excellence of the D-6000. As long as you're not looking for what we'd consider rather esoteric functions (like index-number programming), we don't see how you could possibly go wrong with so solid a design.

### Harmonic Distortion

<table>
<thead>
<tr>
<th>Frequency (kHz)</th>
<th>Harmonic Distortion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>0.01%</td>
</tr>
<tr>
<td>40</td>
<td>0.1%</td>
</tr>
<tr>
<td>80</td>
<td>0.4%</td>
</tr>
<tr>
<td>160</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

### Impulse Response

- **Input Impedance**
  - Fixed: 57 ohms
  - Variable: 575 ohms
- **Output Impedance**
  - Headphone: 150 ohms

---

**Sony TA-F700ES Integrated Amplifier**

**Dimensions:** 17 by 6½ inches (front), 15 inches deep plus clearance for controls and connections. AC convenience outlets: two switched (100 watts max. total), two unswitched (100 watts max. total). Price: $700. Warranty: "limited," three years parts and labor. Manufacturer: Sony Corp., Japan; U.S. Distributor: Sony Corporation of America, Sony Dr., Park Ridge, N.J. 07656.

---

JULY 1987 27
After the mountains of Europe, the canyons of North America pose no problem for a Blaupunkt.

For a Blaupunkt car stereo, the radio reception difficulties created by big city buildings are no big deal. Because ever since the first Blaupunkt was introduced in 1932, our tuners have had to overcome much bigger obstacles.

The Alps.
The Pyrenees.
The Apennines.
These European mountain ranges make even the towering headquarters of modern mega-corporations appear puny by contrast.

Yet thanks to the ingenuity of our 326 car audio engineers in Hildesheim, West Germany, Blaupunkt car stereos are superbly equipped to handle even the most extreme FM reception problems.

You see, a car stereo's ability to capture an FM radio signal is determined by five factors: FM sensitivity. Selectivity. Multi-path distortion. Signal attenuation. And RF intermodulation.

Most car stereo systems do a reasonably good job with two—perhaps three—of these factors.

But due to the persistence of our engineers—and the dozens of patents we've earned in this area alone—Blaupunkt's CODEM III and ORC II dynamic tuning systems do exceptionally well in all five areas.

Which helps explain why Blaupunkt has earned a reputation for engineering the world's finest tuners.

We even take the trouble to design our own antennas.

Something not one of our competitors bothers with.

So if you're an urban motorist frustrated by all those buildings wreaking havoc with the signals of all your favorite stations, pay a visit to your independent Blaupunkt car stereo specialist. (For the one nearest you, please call us at 1-800-237-7999.)

What you hear will be music to your ears.

Without all the static you've been accustomed to.

Blaupunkt
Designed for people with ears.
And something between them.
DYNAMIC POWER (at 1 kHz)

8-ohm load 4.1 dBW (140 watts)
4-ohm load 8.2 dBW (280 watts)

OUTPUT AT CLIPPING (at 1 kHz; both channels driven)

8-ohm load 12.5 dBW (400 watts)
4-ohm load 25 dBW (800 watts)

RATED POWER

20.2 dBW (105 watts/channel)

21.5 dBW (140 watts/channel)

DYNAMIC POWER (at 1 kHz)

8-ohm load 21.9 dBW
4-ohm load 23.7 dBW

DYNAMIC HEADROOM (re rated power)

4-ohm load 8-ohm load

3 dBW 21.5 dBW

FREQUENCY RESPONSE

+1.7 dB +2.2 dB

-0.013% -0.001%

0 Hz 20 Hz 100 Hz 1 kHz 2.5 kHz 5 kHz 20 kHz

DIA PHONO EQUALIZATION

+1/4 dB, -1/4 dB, 0 dB

Sensitivity & Noise (at 0 dB; A-weighting)

+3/4 dB at 5 Hz

+3 dB at 20 Hz to 20 kHz

-3/4 dB at 3 Hz

-1/4 dB at 20 Hz to 20 kHz

Sensitivity

0.256 MV

Noise level

77 dB

INPUT IMPEDANCE

515 ohms

515 ohms

515 ohms

-11.4 dB

OUTPUT IMPEDANCE (to tape)

1,000 ohms

1,000 ohms

1,000 ohms

73 dB

INFRASONIC FILTER

-3 dB at 9 Hz, ≈7 dB/ octave

HIGH FIDELITY
bared wires only. If you want to add a speaker equalizer or other outboard processor, there are preamp-out and amp-in jacks on the back panel, with a switch (instead of the usual, easily misplaced jumpers) to break the normal connection between sections.

The power section is rated not only at 8 ohms (the standard for home equipment as mandated by the Federal Trade Commission) and at 4 ohms (common practice, particularly for commercial-sound and car systems, in which 4-ohm speakers are the norm), but also at 6 ohms. The three ratings make a regular progression (105, 120, and 140 watts, or 20.1, 20.8, and 21.5 dBW) as load impedance drops, suggesting that the built-in protection circuitry will not prematurely limit power as current drain increases, despite the back-panel caveat to stay with 8 ohms or more per speaker if you drive two pairs simultaneously. The DSL data confirm this impression, though output at 2 ohms does back off slightly from the 4-ohm figure in the dynamic-power test.

But with more than 23 dBW (200 watts) available for music peaks at both these impedances, this amplifier clearly is no slouch. Distortion measured only a hair above our reporting threshold (of 0.01 percent), and only at full rated power and very high frequencies—a combination of factors you're unlikely ever to experience with normal music. Moreover, it proved to be entirely the second harmonic (the least offensive of by-products) and, because of the fundamentals' frequency range, beyond audibility in any event.

Essentially, the Sony TA-F700ES is a traditional (meaning audio-only) integrated amplifier that aims to forgo splashy special effects and give you a little more than you're likely ever to need where it really counts: in distortion-free power, input and tape options, and solid construction. It succeeds admirably.

**TEST REPORTS**

AR TSW-410 Loudspeaker

**DIMENSIONS:** 12 1/4 by 24 1/2 inches (front), 11 1/2 inches deep. **PRICE:** $530 per pair in walnut, $536 per pair in oak. **WARRANTY:** "FULL," FIVE YEARS PARTS AND LABOR. MANUFACTURER: ACOUSTIC RESEARCH, 330 TURNPIKE ST., CANTON, MASS. 02021.

IN THE TSW SERIES (WHICH REPLACES THE BXi Series), AR has designed a line of speakers stretching from low to moderate prices ($212 to $850 per pair), with similar construction and styling. TSW stands for Titanium/Solid-Wood, evoking both the oak or walnut slabs (your choice) at the top and bottom of each enclosure and the titanium Tetra-Helix tweeter shared by all but the bottom model (TSW-100, which has wood only at the top). The bottom four models are two-way systems; the remaining three, beginning with the TSW-410, are three-way.

The Tetra-Helical Constant Intensity Radiator, to give the tweeter's full name, is presented as the centerpiece of the series. Its diaphragm is a 1/2-inch titanium dome; fluid cooling is used in its voice-coil gap. The name is supplied by AR's "helicoid theory" of tweeter propagation, and a patent is pending on the device itself. The basic thrust is to prevent the sort of quasi-resonance that can be created by interaction of a sound's wavelength and the distance it must travel between the diaphragm and an exposed edge of the mounting plate. An edge concentric with the diaphragm acts cumulatively at a single frequency, since that frequency is everywhere diffracted in the same way from the plate edge, disturbing both frequency response and radiation pattern.

A common solution (though a relatively expensive one in terms of machining) is to bury the edge of the mounting plate by setting it flush with the baffle. This gives the sound no edge from which to diffract. AR has, instead, shaped the plate so that the distance from the center of the diaphragm varies from point to point along the edge of the mounting plate, spreading out over a band of frequencies and keeping it from accumulating significant amplitudes at any one pitch. Further aiding the process are an "acoustic lens," or phase-plug assembly, immediately over the dome and an Acoustic Blanket surrounding the tweeter assembly (and the midrange driver on the larger models of the series). The blanket is intended to absorb acoustic energy moving past the tweeter mounting plate and along the baffle surface before it reaches—and can be re-radiated by—the grille, which is constructed of a sturdy plastic frame with steel rods.

The grille's stretch fabric is held out at an angle by the rods so that the bottom end juts out farther than the top end. Although this suggests a sloping baffle, as in some supposedly phase-coherent floor-standing designs, the TSW-410 isn't intended for floor placement, and the baffle behind the grille actually is vertical. The owner's manual is written to cover a broad range of models and contains only generalized statements on placement, but an AR spokesman suggested using a stand and keeping the TSW-410 away from the wall behind it for testing. As we found out, this placement is best for listening also.

The 8-inch woofer and 6 1/2-inch mid-range driver—both with filled-polypropylene cone diaphragms and acoustic suspension loading—are mounted on the vertical axis, as is the tweeter. Nominal crossover frequencies are 3.8 kHz and 450 Hz, which is...
SOUNDCRAFTSMEN, WHICH HAS ALWAYS
taken a very iconoclastic American
approach to amplifier design, has also,
through its unorthodoxy, made some im-
portant contributions to amplifier design
particularly at high levels with current-limit-
ed amplifiers. AR's impedance rating—4
ohms nominal, with a 3-ohm minimum—is
conservative, but it makes the point. Within
the audio band, DSL found no impedance
value below 4 ohms (at 20 Hz), while the
maximum value (at 80 Hz) measured 8.6
ohms. The minimum above the bass-reso-
nance frequency (sometimes taken as the
rating point, and here near 200 Hz) mea-
sures 4.3 ohms. From the midrange up, all
values are between 5 and 8 ohms.

Above bass resonance (at 80 Hz, on the
basis of the impedance curve), the distortion
measurements consistently averaged ½ per-
cent or less until drive level approached the
maximum used in these tests. And even at
that point (100 dB sound pressure level), the
average is less than 1 percent, which we'd
judge good for a speaker of this size. Sensi-
tivity is a bit greater than we might have ex-
pected from the design and actually mea-
sures 3 dB higher than AR's spec—though
the moral here is that there are many ways to
measure sensitivity, so compare figures
from different sources at your peril.

We were very pleased by what we heard.
Again, we considered the heaviness of the
bass unacceptable with the speakers on the
floor, but the balance is very fetching with
the recommended stands in place. The
"personality" of the TSW-410 is open and
lively, dynamic range and imaging are both
above reproach, and coloration is slight. In
short, AR has done it again.

TEST REPORTS

Soundcraftsmen Pro-Power 4
Power Amplifier

DIMENSIONS: 19 BY 5 1/2 INCHES (FRONT PANEL), 10 INCHES DEEP PLUS
CLEARANCE FOR CONNECTIONS. PRICE: $749. MANUFACTURER:
SOUNDCRAFTSMEN, 2200 S. RITCHEY, SANTA ANA, CALIF. 92705.
TO FILL OUT YOUR COMPACT DISC COLLECTION, JUST FILL IN THE COUPON BELOW.

TAKE ANY 3 CDs for $1
WITH MEMBERSHIP

334927. Tina Turner — Break Every Rule (Capitol)
334928. Glenn Miller Orchestra — In The Digital Mood (Digital—GRP)
293357. Led Zeppelin — Houses Of The Holy (Atlantic)
346827. Bob James and David Sanborn — Double Vision (Warner Bros.)
345105. Bangles — Different Light (Columbia)

345777. Peter Gabriel — So (Atlantic)
346668. Jim Croce — Photographs And Memories—His Greatest Hits (Soundscreen)
334391. Whitney Houston (Arista)
333286. Phil Collins — No Jacket Required (Atlantic)
349085. Johnny Mathis/Henry Mancini — The Hollywood Musicals (Columbia)
286914. Fleetwood Mac — Rumours (Warner Bros.)

344622. Anita Baker — Rapture (Elektra)
349904 — 349905. Motown 25 I I Hits From 25 Years (Motown)
291278. The Doobies — Best of The Doobies (Warner Bros.)

345946. Genesis — We Can’t Dance (Atlantic)
346892. Tony Bennett — Duets (Columbia)
345965. Kate Bush — Hounds Of Love (Capitol)

345377. Billy Joel — The Bridge (Elektra—Columbia)
342731. Lionel Richie — Dancing On The Ceiling (Motown)

353449. The Police — Every Breath You Take—The Singles (A&M)
3489/40. Original Soundtrack — Stand By Me (A&M)
346320. Billy Joel — The Bridge (Elektra—Columbia)

343721. Rolling Stones — Some Girls Live In Texas (Atlantic)
351692. Kansas — Leftoverture (A&M)

341073. Steely Dan — A Decade of Steely Dan (MCA)
349997— 349999. Steve Wonder's Original Master Tapes (Motown)
348108. Buddy Holly — From The Original Master Tapes (Digitally Remastered — MCA)
206538. Oingo Boingo — Greatest Hits (Columbia)

351718. Georgia Satellites — Broods (Epic)
351722. Bruce — The Final Countdown (Epic)
350140. Pretenders — Get Close (Sony)
349070. Terence Trent D'sorao — Sings With —Flight Chamber Symphony, Gerard Schwarz (Digital—Nonesuch)
348318. The Police — Every Breath You Take—The Singles (A&M)
348964. Original Soundtrack — Round Midnight (Columbia)
351556. Vladimir Horowitz — Play Favorite Chopin (Digitally Remastered—CBS Masterworks)
358266. RIO — Speedo — Wolf As We Know It (Epic)
353037. Miles Davis — Sketches of Spain (Digitally Remastered—C Jazz Masterworks)
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The Pro-Power Four contains both 8- and 4-ohm sets of output protections, which are blocked gratings that are the intake and exhaust of the unit's front-panel rack-mounting holes.

The rear panel contains large not-to-be-blocked gratings that are the intake and exhaust of the unit's fan, as well as multiway binding posts for the two speaker connections and the input pin jacks. Soundcraftsmen, cognizant of the high voltages that can be generated at the output terminals of such a powerful amplifier, thoughtfully provides push-on insulators for the binding posts.

These are meant to cover the hot (red) terminals when they are directly connected to stripped-wire speaker cable.

Soundcraftsmen, in a letter to High Fidelity explaining some of the design goals for the amplifier, also expounded the proposition, almost heretical in these days of 6-dB dynamic headroom, that an amplifier's continuous power is "of much more importance to accurate musicality than peak power." They justify this statement—rather well, we think—by noting that there are sufficient numbers of sustained peak passages [longer than the 20-millisecond bursts of the official dynamic headroom measurement technique], particularly with the increased use of CDs, to make it extremely important that an amplifier have continuous power capability for reproducing those sustained high energy requirements." This is a valid point, and has been noted by other manufacturers who, instead of taking Soundcraftsmen's approach of providing prodigious amounts of continuous power, have opted only to extend the duration of their amplifiers' peak-power output to longer than 20 milliseconds.

The tight power-supply regulation, together with the emphasis on continuous output power, probably account for Diversified Science Laboratories' somewhat curious dynamic power readings, which, instead of being higher, are equal to or even less (in the case of 8-ohm loads) than the amplifier's continuous power at clipping. Not to worry. With a clipping power of 245 watts (23.9 dBW) into 8 ohms and 345 watts (25.4 dBW) into 4 ohms, and despite the rather low dynamic headroom, the Pro-Power Four has enough behind it for all but the most difficult listening situations (such as very inefficient speakers driven to disco levels in a large room). Particularly noteworthy is the ability to put out peaks of 355 watts (25.5 dBW) into 2-ohm loads.

Distortion was at all times well below audibility and, in any case, consisted principally of the relatively benign third harmonic. Signal-to-noise ratio, damping factor, and channel separation were all line, and the input characteristics (sensitivity and impedance) are suitable for connection with nearly any preamp.

Output protection for the Pro-Power Four consists of multiple thermal sensing devices controlling the speed of its fan. The blades are always turning while the amplifier is on and, as DSL found, they switch into a rather noisy high gear after the amplifier has been delivering full power for several minutes. Our listening tests using typical pop and classical music played at rather loud levels over inefficient speakers (with a sensitivity rating of only 86 dB SPL) activated the high fan speed only rarely, and most of the time it couldn't even be heard over such loud music. Deliberately attempting to obtain the high fan speed continuously with music wouldn't probably have put our hearing, and the structural integrity of our listening rooms, at risk. There also was no reason to push the amplifier so hard. The Pro-Power Four smoothly and cleanly handled every music we gave it, with power to spare.

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**TEST REPORTS**

**Proton VT-210 Monitor/Receiver**

**DIMENSIONS:** 21 1/2" BY 19 1/2" INCHES (FRONT), 20 1/2" INCHES DEEP;
**SCREEN:** 20 INCHES (DIAGONAL), **PRICE:** $849, **WARRANTY:** "LIMITED," **ONE YEAR PARTS AND LABOR, TWO YEARS ON PICTURE TUBE. MANUFACTURER: MADE IN TAIWAN FOR PROTON CORP., 737 W. ARTESIA BLVD., COMPTON, CALIF. 90220.

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**JEFA Vu—LITERALLY! JUST ABOUT A YEAR ago (August 1986), we reviewed the Proton 619A stereo monitor/receiver and found it performed "as well as or better than any other comparable unit we've tested in almost every category." Now we return to Proton to review the VT-210, a new 20-inch (measured diagonally) monitor that has essentially the same styling, the same lineup of features, and as it turns out, very similar performance to last year's slightly smaller model.**

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**JULY 1987 35**
As with the 619A, the VT-210's tuner spans all 82 VHF and UHF broadcast channels plus midband (A1-A3), superband (J-W), and hyperband (AA-WW and AAA-EFF) cable channels. Connection to cable or VHF is via a standard F connector, and there is provision for a 300-ohm twinlead UHF antenna. As with the 619A, there's a second pair of F connectors to hook in a pay-TV decoder, or a computer or video game generating an RF signal. If your computer has a digital (TTL-level) RGB output, the VT-210 handles it as well.

In addition to the RF inputs and the RGB connection, the VT-210 accommodates three composite video inputs with accompanying stereo audio connections. In round-robin fashion, these are selected by pressing either the front-panel 'TV/Video button or an equivalent one on the wireless remote. Other front-panel buttons scan through the channels you've "memorized," raise and lower the volume, select between the antenna and auxiliary inputs, and power up the set. The remote performs all these functions and, additionally, provides direct access to any channel (via a numerical keypad), selects the channel previously tuned, activates the on-screen channel-number display, and engages the audio muting and sleep timer. The timer can be set to automatically turn off the VT-210 after 5 to 90 minutes.

Behind a hinged panel beneath the screen are the setup controls: master power (to disconnect the set from the line when you're away for an extended period), vertical hold, color, tint, black level (brightness), picture (contrast), and detail. The color, tint, and black-level knobs have center detents suggesting the recommended settings. Separate bass, treble, and balance controls (also with center detents) affect the sound to the two small built-in speakers as well as the audio at the variable line outputs. (There are no speaker output connections.)

To the right of these controls, also behind the door, is a series of buttons and switches that program the channel memory, select between TV and CATV (cable) operation, and select automatic or manual fine-tuning (the latter accomplished via small up/down buttons above the switch). Three more switches activate Proton's video low-level noise reduction circuit. Choose between normal operation and the RGB input, and between the SAP and main broadcast stereo audio channels. On the back panel are switches to disconnect the internal speakers, choose the sync polarity for the RGB input, and engage a 3.58-MHz trap that can help clean up the picture when using the monitor with a computer or video game.

In addition to the three direct audio-video inputs, the VT-210 sports three sets of rather versatile audio-video outputs. The first (labeled TV) carries the channel (picture and sound) to which the set is tuned, independent of the source you've chosen to watch. Thus, you can record a broadcast on a VCR connected to this output while viewing any of the three direct video inputs. Or, by jumping the TV output to one of the direct video inputs and connecting your FM tuner to the corresponding audio input pair, you can receive simulcast broadcasts by choosing that video input and setting the video tuner to the appropriate TV channel and the FM tuner to the station carrying the audio.

In addition to the TV-out jacks, there are two other sets of audio-video outputs, one having fixed audio levels and one whose audio is affected by the VT-210's volume, balance, and tone controls. The former connections are the obvious choice for recording on a VCR; the latter's audio connections would be appropriate for driving an external power amplifier or powered loudspeakers. And the second video output could come in handy to drive a second monitor.

One of the clearest differences between last year's 619A and this year's VT-210 is the larger picture tube itself. The new model has a square-corner CRT with an exceptionally flat face, providing distortion-free viewing over a wide seating area. It is very difficult to maintain geometric linearity with a flat-face tube (so that objects do not change shape as they appear on different parts of the screen), yet Diversified Science Laboratories reports that the VT-210 is absolutely superb in that regard. Furthermore, the picture is almost perfectly centered along both axes and exhibits negligible overscan.

One of the most impressive attributes of the new CRT is its color accuracy, particular-
ly on difficult-to-reproduce deep greens, which are noticeably less "limey" than we've seen on most other tubes. The reds will tend to lean toward orange but not as much as on many other sets. Overall, the color rendition is excellent—both on the test bench and in normal viewing.

Black-level retention—a Proton specialty—is also excellent, and the picture is perfectly interlaced. Video transient response is, if anything, better on the VT-210 than on its predecessor, and the three color rasters proved equally pure. (Actually, as received, there were some blotches in the raster, but after we followed Proton's automatic de-gaussing instructions—turn the set off for 10 minutes and turn it back on, repeating if necessary—the blotches disappeared.)

Gray-scale linearity and the related chroma differential gain are excellent, and there is very little change in hue with changes in scene brightness (measured as chroma differential phase).

In convergence, blooming, and horizontal resolution, however, the VT-210 does not quite live up to the performance of the earlier model. Convergence on our sample was only fair, with blues shifted slightly to the left over most of the screen. But since the error was so uniform, we believe a competent technician could readjust the set for excellent overall convergence. (Misconvergence over only a portion of the screen is harder to correct.)

With the black level set at the detent, there was noticeable blooming over the upper half of the contrast range. This may have degraded the horizontal resolution, which at reduced contrast levels is better than the approximately 290 lines reported in the data. All measurements were made with the detail knob at maximum. Turning it down mainly affects resolution in the 1.5- to 3-MHz region, and is useful for softening an overly harsh picture or for reducing snow. This may need be less often than usual because Proton's video noise reduction does reduce low-level snow in many pictures without grossly (or even noticeably, in many instances) degrading high-level resolution.

The tuner's video frequency response, measured through the TV output, rolls off above 3 MHz, implying a resolution of perhaps 260 lines. But since this output will be used mainly to record broadcasts on a VCR—and no current decks have anywhere near that resolution—we consider the loss relatively unimportant. As far as viewing is concerned, picture resolution through the tuner is almost as good as from the direct-video input.

Coming from the TV output, luminance level is higher and chroma level lower than standard, but they are within the automatic-gain-control range of an average VCR. Gray-scale linearity is very good, as are color accuracy and chroma differential phase. The chroma differential gain is less than we've seen on many other tuners and occurs only in the brightest parts of an image.

The tuner's audio response is adequately flat from 50 Hz to almost 15 kHz, whereupon a "whistle filter" kicks in and does a good job of removing the horizontal-scan frequency. Signal-to-noise ratio is at least average with a black raster and better than average in the worst case (when displaying the convergence test pattern). Maximum audio output level is higher at the variable output than at the fixed or TV outputs, but is more than adequate in all three cases. Output impedance is also low enough to be of no concern. The tone controls (which affect only the signal at the variable output and to the internal speakers) hinge at 1 kHz and provide a range of approximately +12 dB, -8 1/2 dB at 50 Hz and +8 1/2 dB at 10 kHz.

Although we would prefer less picture blooming and the essentially "perfect" resolution of the 619A (which probably would have been there without the blooming), we're nonetheless pleased with the Proton VT-210. It is a well-conceived and excellent-ly realized monitor/receiver. Besides, there are still only two program sources (live broadcasts and videodiscs) that come close to taxing the 330-line resolution of which the NTSC system is capable. Both can look superb on this monitor.

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Alpine 7902 Car Tuner/CD Player

Alpine says its 7902 is the first front end to combine a CD player with an AM/FM tuner on a single chassis. It is certainly the first product of that description we've tested. (The only other AM/FM/CD combination we've reviewed needed a second chassis for the power-supply and tuner circuits but included a stereo power amp, which the 7902 does not.) The 7902 turns out to be an excellent performer with equally excellent ergonomics and thus a very welcome newcomer to the car CD-player field.

The 7902's single-chassis design simplifies installation if you're going for an all-Alpine system. The company uses multipin DIN-style jacks to hook everything together with minimum fuss. If you want to mix brands, Alpine offers an adapter that supplies more common connectors: round male and female for ignition, battery, and female for antenna input, standard coaxial female for antenna input, round male for "interface" (to Alpine alarm system), spade lug for ground; multipin DIN-style male for front and back line outputs, multipin DIN-style female for line input; standard coaxial female for antenna input. Fuses: 3-amp in ignition line (and in ignition and battery lines of accessory adapters to mate multipin DIN connectors). Price: $850. Warranty: "Limited," one year parts and labor. Manufacturer: Alpine Electronics, Inc., Japan: U.S. distributor: Alpine Electronics of America, Inc., 19145 Gramercy Pl., Torrance, Calif. 90501.
One curious aspect of the hookup scheme that isn’t clarified in the otherwise helpful owner’s manual is that there’s no chassis battery lead to supply an uninterruptible power source for the unusually comprehensive memory functions. Instead, that line must be hooked up via one of the three multipin connectors: Two male plugs interconnect with front and back power amps, respectively, while the female connector is for input from an auxiliary source for future expansion.

In any of these connectors, the battery pin powers the memory functions for the tuner, clock, and CD-player track location. When you shut off the ignition during disc play, the disc isn’t ejected. When you restore power, playback continues right where it left off, just as if you had put the player into pause. However, you can’t similarly interrupt play to check a broadcast news report, because the tuner functions only when you eject the disc. If you want to resume disc play after listening to the radio, you must reexecute manually.

The front-panel layout makes heavy use of the traditional Alpine large, square illuminated buttons, which sometimes change color from green to amber—for example, when you select a station preset. At the left is the only knob cluster: for volume (the main knob), fader (the outer ring), balance (pulling the main knob), and on/off (tapping the main knob). Above it are center-detented sliders for treble and bass.

Two rocker switches to the right of the knob cluster are particularly satisfying in their behavior, since they double on closely related functions for tuner and CD. The first offers up or down station-seek for the tuner, forward or back track-seek for CDs. The next tunes manually up or down or cues (at higher than real-time speed but with reduced output) forward or back across a CD. The top of the third rocker is a mono/stereo switch that affects only the FM tuner; the bottom is a memory-enable switch used for both adjusting tuner presets and programming (or adding to) a CD track sequence.

The first two buttons to the right of the display serve single purposes. The upper button steps through the tuner-preset banks (two FM and one AM). Each holds six frequencies, corresponding to the six numbered buttons farther to the right. Below the tuner-bank button is one that toggles between play and pause for CDs. The six station presets double as special functions for the CD player: CLEAR clears one or all slots in the programming memory, depending on how long you press it; PRESET operates after the left-hand memory button has been pressed and enters the currently selected track at the first free programming slot while stepping the memory to the next slot (it can also be used to correct the last entry); P.S.P. (preset play) begins playback of a programmed sequence; REPEAT steps between a repeat of the current track, repeat of the entire disc, and off (it won’t repeat a programmed sequence); SCAN samples each track in turn for ten seconds and will follow a programmed sequence if one is in memory; and A.D.I. (automatic disc initializer) restarts play from the top.

When you insert a disc into the slot, it automatically overrides the tuner output. (CONTINUED ON PAGE 43)
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TUBULAR SOUND
I'VE HEARD IT SAID MANY TIMES THAT TUBE POWER amplifiers have a more natural, mellower sound than the best of today's transistor amplifiers. Is that true, and if so, why?
Sam Silvana
Bell, Calif.

To mix a metaphor, you've asked me to juggle a hot can of worms. First of all, what makes for a "more natural, mellower sound?" Tube power amplifiers, with only one exception that I know of, use massive output transformers. In most cases, these transformers, not the tubes themselves, are responsible for the frequency-response characteristics that make up some of the "tube" sound (when such a sound actually exists). Such transformers can cause an amplifier's damping factor at low frequencies to fall far below its mid-range spec. With many speakers, this alters the bass response to provide the sort of warm, mellow sound preferred by some listeners.

It's frequently possible to provide solid-state amplifiers with some of the same sonic warmth as those tube units. This is easily done by connecting a 0.5- or 1-ohm, 10- or 12-watt resistor in series with each of your speakers. This increased series resistance was the reason that some audiophiles at one time advocated the use of thin, 22-gauge wire for speaker cable. I would be interested in hearing about the results from readers who try the resistors.

Other characteristics of tube equipment missing from well-designed solid-state components, and possibly responsible for any difference in sound quality, are higher distortion and higher noise.

SPEAKER IMPEDANCE
These days, most manufacturers rate their speaker system impedances at 4 or 8 ohms, but I remember when systems of 16 ohms—and even higher—were common. What's the story on speaker impedance, and what determines the rating a manufacturer chooses?
David Lee
Ft. Lauderdale, Fla.

A couple of the engineers to whom I referred this question took the historical approach in their replies. They stated that speakers of 16-ohm impedance provided the best match to tube amplifiers, that 4-ohms represented the most appropriate load for the early germanium output transistors (which could handle high currents but not high voltages), and that 8 ohms was a reasonable choice for today's silicon-based solid-state amplifiers. And the use of 8-ohm impedances allowed running two systems simultaneously without over-stressing the amplifier.

The EIA (Electronic Industries Association) Amplifier Standard specifies 8 ohms as the primary standard load with which amplifier manufacturers rate their products' output capabilities, but this is in no way binding on the speaker manufacturers, nor should it be. Four-ohm speakers have the advantage that they can draw as much as double the output power from an amplifier—assuming that the amplifier can satisfy the increased current demand. However, many amplifiers run into trouble when attempting to drive two sets of 4-ohm speakers. A few speaker manufacturers are now producing 6-ohm-rated systems as a neat compromise between the opposing dangers of running out of current (low speaker impedance) or running out of voltage (high impedance). The improved protection circuits and output current capabilities found in today's amplifiers enable them to handle paralleled pairs of 6-ohm and, sometimes, 4-ohm speakers.

Several engineers I spoke to complained about the non-standard ways speaker impedance is rated by different speaker manufacturers. Among the various rating methods—each of which would produce a different impedance rating for the same speaker— are (1) DC resistance only, (2) minimum impedance in the audible range, which usually occurs within an octave or so above a speaker's bass resonance, (3) impedance at some specified frequency, and (4) an "average" impedance value arrived at by eyeballing an impedance vs. frequency curve for the speaker. The first two methods usually yield the lowest numbers and are therefore the most conservative with respect to the amplifier interface. Since there is no official standard for specifying impedance, a manufacturer's rating depends simply on what he chooses to regard as "nominal." Unfortunately, the impedances of a few 8-ohm-rated speaker systems fall as low as 2 ohms at certain frequencies. This can trigger the protective circuits of some amplifiers or cause them to overheat.

LINEAR STEREO VCR
I RECENTLY SAW AN RCA AD THAT WAS OFFERING BOTH "Hi-Fi Stereo" and "Linear Stereo" videocassette recorders. Is Linear Stereo an improved version?
Peter Seigal
Boston, Mass.

The main audio soundtracks on a videocassette have always been "linear," meaning that they are recorded on a line down the length of the tape by a stationary audio head, much as in an audio cassette recorder. However, the narrowness of the stereo tracks and the slow tape speeds across the fixed record/playback head result in tape noise and limited high-frequency response. Dolby B and other noise reduction circuits (like DNR) can be of some help, but the result would never qualify as high fidelity.

The high-quality alternative to "linear stereo" is not non-linear stereo, but helical-scan stereo. The Hi-Fi audio recording systems used by the Beta and VHS formats both employ the spinning video-head drum to lay down a frequency-modulated stereo signal. This helical track, which is highly complex, can be of some help, but the result would not qualify as high fidelity.

In short, mono-only VCRs play and record a linear mono soundtrack; stereo VCRs do the same for linear stereo soundtracks (they can also play linear mono sound); and Hi-Fi VCRs play and record helical-scan frequency-modulated stereo as well as linear mono or, in some machines, linear stereo.

We regret that the volume of reader mail is too great for us to answer all questions individually.
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DAT Certain Feeling

In what some would characterize as a Pavlovian reaction, audio editors are always excited by the arrival of a box containing a new stereo component. But the large carton from Luxman that arrived at the beginning of May elicited more than the usual salivation from this audio aesthete: It contained a sample of Luxman's first DAT machine, the KD-117, specially modified by Luxman to work on American instead of Japanese line current. As the first DAT deck we've been able to examine for any length of time (only two days, as it turned out), its features and capabilities were of intense interest. What struck me most from this brief acquaintance was the very distinctive "feel" of the DAT medium, which is in many ways quite unlike the familiar analog cassette.

Every new audio medium has its own operational peculiarities (features, to the optimist) to which users—and record producers—have to adjust. With the vinyl LP, it was long playing times; with stereo, it was the use of two speakers and the restriction of the listening position to a "stereo seat." The analog cassette was audio's first medium that was both easy-to-use and fairly durable, while the CD introduced an unprecedented speed of access to any portion of a recording. DAT, on the other hand, actually introduces unprecedented speed of access to any portion of a recording. DAT, on the other hand, actually introduces unprecedented speed of access to any portion of a recording.

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But the features of a DAT deck that I think will ultimately be most important to the user are unfortunately the ones that usually don't make for spectacular advertising copy: cueing capabilities. For the first time in a consumer recording medium, the user will have the kind of control over cueing that has previously been the exclusive domain of the Compact Disc—if the deck is appropriately equipped. The DAT standard specifies methods for electronically labeling sections on a DAT with track (or band) numbers, but it does not tell how to best accomplish this function. This is where DAT deck designers will—or should—let their imaginations run wild.

For instance, the front panel of the Luxman deck features two small knobs, one an on/off switch labeled AUTO START-ID and the other a three-position switch called BLANK NOISE. The three positions of the latter—DIGITAL SOURCE, -60, and -80—give a small hint as to what these controls do: While recording, they automatically assign track numbers to sections of the music if the level of the sound drops below the assigned blank-noise level for a certain period. DIGITAL SOURCE requires that there be a near-total drop-off in background noise, as in the intertrack spacings of a CD, before the assigned track number is incremented. The other two settings of BLANK NOISE set the "noise floor" below which the signal must fall in order to increment and assign a track number. The system isn't foolproof and, on our sample, seemed to miss assigning some track numbers as we tried to record certain classical CDs (those in which the record producers rightly included "room tone" to produce sonic continuity between selections). Automatic track-number assignment is necessary, however, since the KD-117 seems to have no method of manually assigning track numbers (although we might have learned otherwise with an English instruction manual). Other DAT decks we've seen do include manual track-number assignment and resetting.

There are other small, but useful, differences between the DAT and analog-cassette media. The "write-protect" tab of a DAT actually slides open so that you can re-record on a cassette without using a piece of adhesive tape to cover the protection hole. A DAT cassette itself includes indicators for the length of the tape it contains, so you shouldn't have to wait to start the DAT machine the tape length in order for its remaining-time indicator to work properly. Many, but not all, of the first DAT decks have a CD-like audible fast-scan mode in which the music comes out at the correct pitch. Fast-forwarding, rewinding, and cueing are much faster than with analog cassettes, though not as fast as with CDs. Zipping from one end of a two-hour DAT to the other takes approximately 40 seconds, at least with the Luxman unit. But as soon as you get your hands on a DAT deck, you'll probably find these features to be far less important than your ability to quickly and accurately cue up selections, and even subsections of selections, using the format's various cueing modes. Aside from DAT's superb sound quality, these modes are the most important aspect of the new medium.

Note: Luxman, and all the other companies that have released DAT units in Japan, have, as of early May, made no announcement of DAT product availability or pricing in the U.S. 20
A Biased Report

Time was when magnetic recording was totally unbiased. That is, the signal representing the sounds to be recorded was the only one fed to the recording head. But magnetic recording media are notoriously nonlinear at low signal levels, and even loud sounds get soft—twice each cycle for anything approaching a continuous tone. It wasn't long before someone discovered that adding a steady magnetic field, or bias, to the AC audio signal helped matters considerably by maintaining a continuous magnetic flux at the record-head gap, essentially offsetting (biasing) the recorded signal away from the most nonlinear levels.

Home recordists seem to have trouble with the concept of bias, partly, I suspect, because tape manufacturers often speak of bias as though it were a property of the tape rather than the recorder. "High bias" tape does have characteristics differing from those of "normal bias" tape, but the bias itself is supplied by the deck and is nowadays generated by an AC oscillator instead of a permanent magnet.

The discovery of such AC bias, which was a significant advance, dates from the early 1940s, when it was developed independently by Telefunken in Germany and by Marvin Camras in Illinois. To get a feel for how it works, think of yourself as a cook trying to get flour from a canister into a measuring cup. You can hold the canister horizontally and quickly spoon the flour out in dollops, but intuitively the process seems less efficient than pouring. The catch is that flour doesn't flow like a liquid. You can tilt the canister until gravity overcomes the adhesion of the flour to the canister and cohesion of the flour particles. But once this happens, you're in danger of dumping flour all over the floor. (In this case, gravity, as a constant force, can be compared to DC bias.)

What you probably will do instinctively, however, is tilt the canister somewhat less and tap on it. By overcoming the flour's "stickiness" in this manner (which is like AC bias), you can get it to pour at a more controlled rate, spilling less (creating less distortion and noise, in recording terms) than with either the direct (spooned) method or the DC (gravity alone) bias.

Like all metaphors, however, this one can be carried just so far without being misleading. For one thing, flour is ground to a more or less uniform particle size and thus is homogeneous in a way that sound is not because it contains such a mixture of frequencies and, therefore, of wavelengths. Much of magnetic recording is governed by the wavelength of the recorded tone (as measured from peak to peak of the magnetic flux "imprint" it leaves along the tape).

Recorded wavelength is obviously a function of both frequency and tape speed. The magnetic wavelength of a 1-kHz tone recorded on a cassette is the same as that of an 8-kHz tone on an open-reel tape running at 15 ips—eight times the tape speed of 1⅔ ips. The two tones are consequently similar in the depth to which they will record within the magnetic layer of the tape, the maximum head-gap size that will play the signal back, and the AC bias level that will deliver maximum recording level. Yes, bias doesn't affect all wavelengths—and, therefore, frequencies—alike.

If you could see the output from each frequency range of your cassette deck and crank the bias up from grossly underbiased to grossly overbiased, you'd notice that output at all frequencies increases with bias. The first frequencies to stop increasing are the highs. Then the highs actually start to drop off as bias increases, even though the midrange output is still rising. Then it, too, falters and starts to drop, followed eventually by the bass. If the bias is increased enough, it will completely erase the recording as it is being made. (In fact, the erase-head signal is usually a high-amplitude version of the bias signal.) The amount of bias thus influences both the tape's sensitivity (output for a given input) and, because this effect varies with frequency, its frequency response.

This is why reducing bias by some small amount from what might generally be considered an ideal setting tends to increase headroom (along with sensitivity) at high frequencies, but at some expense in midrange headroom. Raising bias tends to have the reverse effect, improving the midrange at the expense of the highs. The main reason the highs give out first as bias goes up is the boost applied by the recording equalization. This is intended to, and does, raise low-level highs above the inherent tape hiss. But as the total high-frequency signal—boosted program highs plus bias—increases, it eventually becomes powerful enough to erase its own record on the tape. The other reason the highs give out first is that their wavelengths are short. The longer the wavelength, the deeper it records within the tape's magnetic coating and the more impervious it is to self-erasure.

Several circuits have been developed that control self-erasure by altering bias under some signal conditions. The best, and the only one to achieve wide success, is HX Pro headroom extension. It reduces the ultrasonic bias when there's enough high-frequency energy in the signal to provide some of its own bias, keeping the total effective bias constant.

Considerations like these make us think of bias as something that influences the way the highs are recorded, whereas it actually affects the entire frequency range. And its effect can vary considerably from tape to tape, depending on the kind of magnetic particles employed, the thickness of the coating, and so on. This is why I encourage recordists to pick one tape brand and type that they know works well in their decks for the kinds of music they like to record. If you simply pick up whatever is on sale (and particularly if you buy gray-market tapes, whose formulations may differ from those manufactured under the same brand for use in this country or which may actually be counterfeit), you'll be in for some peculiar results sooner or later.

By ROBERT LONG

JULY 1987
Is Now the Time to Go Mobile with Your Growing Compact Disc Collection? If you’re planning to spend over $500 on an in-dash car stereo system, the answer is yes. Quality is up, and prices aren’t getting any lower.

If you haven’t auditioned a car CD player since their introduction several years ago, be aware that things have changed. Mistracking on rough roads has been significantly reduced on second-generation models. Newer players are also much less likely to be affected by deviations from a perfectly horizontal installation or by fluctuating temperatures. Plus, it’s no secret that the sound quality of CDs in general has improved, thanks to better digital recording and re-mastering techniques. If you’re serious about audio and have the requisite change in your pocket, start shopping. Cassette, particularly the prerecorded variety, simply don’t compare in sound quality and convenience.

If you’re waiting for the precipitous price drops that befell home players, don’t hold your breath. Granted, recent models have shown a modest decline in price compared to their predecessors, but as I write, the dollar is hitting new lows versus the yen every day. Any further price drops would be minimal, and a strong possibility exists that the currency situation will force an increase instead. If you’re thinking of a trunk-mounted CD changer, only owners of home CD changers not made by Sony have reason to hesitate. JVC, Pioneer, and Technics all plan to bring car CD changers to market, with others sure to follow. Considering the expense associated with the extra disc magazines, not to mention the possible trauma of having to shuffle multiple CDs between incompatible magazines shortly before leaving for work, it would make sense to share this investment between your home and car.

Don’t buy just any car player without considering the many features available on given models. Let’s assume that you’re looking for a tuner/CD unit, since player-only models are less in demand. Let’s also assume you’ve opted for a single-disc player, since the current selection of changers is a field of two (Sony and Alpine). Here are a few of the features to consider, and why:

**Cartridge loading:** A plus if you are currently riding around with loose cassettes lying in the passenger’s seat or accumulating in the glove compartment. A CD-cartridge system, initially developed by Yamaha (and also offered by JVC, Blaupunkt, Clarion, and Audiotex) provides protection that need not be as clumsy as the traditional CD jewel boxes it replaces, since discs stay in their cartridges even during play.

**Auxiliary input:** Great for listening to those cassettes that have yet to be released on Compact Disc. An auxiliary input comes in two flavors—a front-panel mini-phone jack for patching a portable cassette unit or back-panel pin jacks for a more permanent attachment.

**Dynamic range compression:** Very important if you like to listen to classical music in a noisy car. Unfortunately, this feature is currently available only on the Sony Disc Jockey changer.

**Security:** Since we are talking big-buck systems here, it would be nice if you could retain ownership for more than a week or two. Quite a few players offer some form of internal protection. Those that render their units inoperable if the power is interrupted seem to make the most sense (caution—a master criminal I’m not).

**Single-chassis design:** Makes things considerably easier if you’re doing the installation yourself, but probably won’t matter to a professional installer unless space is extremely limited.

**Amplifier(s):** Only the Sony CDX-R88 comes with an amplifier, which is contained in a separate chassis along with the tuner circuitry. All the others will need at least one power amp, maybe more, to do the job. Don’t forget to budget not only the cost of the amps, but the additional cost of labor for installation as well.

**Fader:** Very important if multiple amps are used and a passive equalizer with a dual-amp balancer is not. Otherwise, an outboard dual-amp balancer will be necessary for front-to-rear level adjustments with four or more speakers. Such balancers may not be difficult to find, but are also an additional $20-plus expense and a potential installation headache. The fader on the aforementioned Sony CDX-R88, for instance, is nonfunctional without at least one external amplifier.

**Programmability:** Great feature for home players, but not such a big deal on a car model. After all, how far from the track-skip button are you likely to be when your least favorite song starts playing? And for reasons of safety, entering a program should be done while the car is at a full stop.

**Direct track access:** Possibly a bit more useful in a car than programmability. This lets you listen to a couple of favorite cuts now, assuming you know their track numbers.

**Ergonomics:** This is no small consideration when buying any car-stereo component, and CD players are no exception. Think about the buttons you’re most likely to use, then examine the various models to see which one devotes the most front-panel area to those functions. Tiny buttons allow more features to be tucked into the same 14 square inches, but their size may render the additions meaningless while on the road. Night illumination also figures prominently here; if possible, turn the lights off while auditioning the player in question. Can you still find the important controls with a minimum amount of searching? Also, try to operate basic functions while not looking at the player. Can you load, play, scan, and stop a disc? Can you change tracks or switch to FM? If not, those microbuttons may be the last things you ever see.

—Jay C. Taylor, Car Stereo Product Manager for Crutchfield
dent in the trade deficit, electronics hobbyists will enjoy assembling Heath's GR-9009 AC/DC 9-inch color-TV kit. The GR-9009 uses a Zenith Chromacolor picture tube and modular chassis with mostly preassembled circuit boards. A built-in crosstalk generator allows convergence and purity adjustments. Features include a 178-channel quartz-locked electronic tuner, automatic color control, and a removable sunscreen for outdoor use. Price is $250. For more information and to request a free Heathkit catalog, write to Heath Co., Dept. 150-915, Benton Harbor, Mich. 49022.

SUPER VHS HITS JAPAN

On April 21, JVC's first Super VHS VCR went on sale in Japan for about $1,550 (at $1.14 to the dollar, then the exchange rate). As described in the April "Scan Lines," Super VHS is said to yield a horizontal resolution in excess of 400 lines and requires a new tape formulation for recording a wider luminance bandwidth. (S-VHS cassettes are otherwise identical to those for regular VHS.)

In addition to composite (single pin jack) video inputs and outputs, S-VHS machines have individual luminance (Y) and chrominance (C) connections to separate brightness information from the color portion of the signal, thus eliminating the picture-degrading effects of crosstalk. New television receivers will take advantage of these separate outputs, and presumably high-quality prerecorded S-VHS tapes will be made from films that have been remastered for feeding duplicators that have Y and C inputs.

S-VHS machines can play regular VHS tapes and include a switch for making regular VHS recordings. Thus, compatibility is ensured during the transition from VHS to S-VHS.

As you read this, the first U.S. machines should already have been shown at the June Consumer Electronics Show. We will report on those in an upcoming issue, as well as any news regarding an S-VHS camcorder and the availability of prerecorded S-VHS tapes.

NO NOISE MAKES NOISE

In January, we reported on a complex new digital technique called No Noise that removes tape hiss, clicks and pops, and other unwanted signals from record companies' master tapes in preparation for rererelease on the very transparent and unforgiving Compact Disc. The company, Sonic Solutions, realizes that many existing recordings would sound unacceptable on CD, especially to consumers who have come to expect near perfection from the digital medium.

We are pleased to announce that the first rerereleases using No Noise processing are now available. They include a 20-year-old live performance at the Taj Mahal by flutist Paul Horn (trade, Rykodisc RCD 10040). For this recording, tape hiss and ambient noise were removed "without diluting the ethereal quality of the performance," according to Rykodisc president Don Rose. Another release is a concert film of a previously unusable 1968 performance by the Doors (MCA Home Video), in which lead vocalist Jim Morrison's microphone cable was loose (one can only imagine how it got that way). The resulting clicks are said to have been removed by No Noise without leaving noticeable artifacts. No Noise is also said to be ideal for restoring old film and television soundtracks.

All releases processed with No Noise are labeled with a special symbol (pictured). Acceptance seems to be running high, and the company plans to license the system to selected facilities around the country. Sonic Solutions is located at 746 Twentieth Ave., San Francisco, Calif. 94121.

A THREATENED INDUSTRY?

With all the talk from record companies about DAT machines, the protection of intellectual property rights, and rampant illegal copying of records, CDs, and prerecorded tapes, one might logically assume that the recording industry has fallen on hard times. But guess what? According to the Recording Industry Association of America, revenues for 1986 rose six percent to $1.65 billion, an all-time high. (First-quarter 1987 profits for CBS Records, a leading naysayer on the DAT issue, are already up a staggering 30 percent from the same period in 1986—a company high.) As expected, unit sales of LPS, EPS, and singles were down sharply (more than 20 percent) and those of cassette ups slightly (two percent), resulting in an overall decline in combined unit sales of about five percent. A 134 percent rise in unit sales of CDs accounts in large part for the increase in total revenue.

Prerecorded cassettes account for well over half the unit sales and revenue for the recording industry. The growth rate of cassette sales peaked in 1985 after years of phenomenal increase that saw it overtake the LP in popularity. Is it a coincidence that as the listener's appetite for the high quality of digital sound grows, so does a disaffection for poor-quality prerecorded cassettes?

The major record companies have stated that they will not support the DAT format with prerecorded tapes. But with analog cassette sales clearly slowing down and CD sales in the stratosphere, it's hard to believe that the big boys won't see the digital writing on the wall. Betcha two bits? C.J.E.

SIGNET LOUDSPEAKER

Best known for phono cartridges, Signet has expanded its repertoire of transducers with its first loudspeaker, the floor-standing SL-100 Definitive Image system. Originally announced about a year ago, it uses an unusual Ferrallipse lens system consisting of two tweeters that fire rearward into an elliptical reflector. The reflected sounds are said to converge in-phase and radiate over a 120-degree angle to eliminate high-frequency beaming, thus better matching the wide dispersion pattern of the lower frequencies.

The midrange driver is a 3-inch soft dome enclosed in a separate sealed compartment. A 10-inch long-throw woofer with a polymer-impregnated cone is housed in a tuned-port enclosure that is said to endow the SL-100 with high efficiency. Amplifier connections are made via gold-plated five-wire binding posts. Price is $1,450 per pair. For more information, contact Signet, 4701 Hudson Dr., Stow, Ohio 44224.
ups: Stereo image expansion broadens the stereo soundstage and dynamic bass expansion increases bass boost in proportion to increasing input signal level. As in Yamaha's remote models, the volume control knob on Onkyo's TX-84 and TX-82 is motor driven for remote operation.

Rounding out the new receivers is the TX-80, a nonremote model rated at 33 watts (15.2 dBW) per channel that also has two tape inputs for dubbing and connections for two sets of speakers.

Dynamic headroom is rated at more than 1.2 dB (into 8 ohms) for each model, yielding dynamic power ratings of 81, 60, and 43 watts per channel from top to bottom. For more information, contact Onkyo, 200 Williams Dr., Ramsey, N.J. 07446.

**TOP NEC DIGITAL VCR**

The four-head DX-5000U VHS Hi-Fi VCR is the third NEC model to include the company's unique digital video noise reduction (NR) system (the DX-2000U was reviewed in our April issue). It uses a field-storage method that reduces noise in playback by consecutive averaging of the video fields, thus improving the video signal-to-noise ratio, especially on poor-quality tapes.

As opposed to the DX-1000U and DX-2000U, where only the luminance signals benefited from digital noise reduction, the improved circuitry in the DX-5000U also processes the chrominance signals separately, yielding a further potential increase in the video signal-to-noise ratio. And the process works on all signals that pass through the unit's monitor output, including those from the built-in tuner as well as signals led through from another source (such as a different-format VCR). The amount of noise reduction applied by the DX-5000U cannot be continuously varied, but is instead determined by a three-position switch that sets the clipping point of the limiter in the NR circuit: Position 1 (normal) sets it low, cleaning up ordinary-quality sources without causing time lag (blurring on scenes with motion) in the picture; if noise is still present, Position 2 or 3 raises the clipping level to a point that allows the noise to be removed while keeping time lag to a minimum.

In addition, the new model incorporates a Digital Dropout Compensator that, says NEC, differs from conventional "line" techniques by analyzing the entire video field to reduce the effects of dropouts caused by dirt or scratches on a tape.

As a consequence of the DX-5000U's field-storage circuitry, striking special effects are possible, including still frame and variable strobe action (with uninterrupted sound) of tape or TV broadcasts. The most welcome of these is Natural Slow Motion, which combines the benefit of four video heads with field storage to provide jitter-free, "nearly professional" forward slow motion on tapes recorded at the SP speed (which includes almost any prerecorded tape). Conventional slow-motion effects are possible in forward and reverse for the other tape speeds.

An indexing system marks the beginning of as many as nine recorded segments, which can then be cued to or successively previewed automatically for ten seconds. To further aid in locating specific segments, a real-time search function is included.

The number of controls on the remote is somewhat daunting, but things are made easier by a built-in LCD panel that confirms every operation, including the setting of the unit's 8-event/21-day timer. The remote also operates most NEC television.

More conventional features include VHS Hi-Fi and linear stereo (with Dolby B noise reduction), a cable-compatible tuner with MTS/SAP decoding, and HQ video circuitry. Suggested retail price is $1,199. NEC is investigating other applications for its NR system, such as in large-screen monitors and projection TVs. For more information, contact NEC Home Electronics, 1255 Michael Dr., Wood Dale, Ill. 60191.

**HANDIER HANDYCAM**

SOUND HAS DOWNSIZED THE ORIGINAL RECORD-only 8mm Handycam to 2.13 pounds (with battery and tape), making it the lightest consumer camcorder ever. Like its predecessor, the CCD-M7U has two-position focus and a solid-state image pickup. Simplicity of operation is achieved by making white balance and iris adjustments completely automatic; the only controls are for recording start/stop and focus position (long-range or arm-length close-up). LED indicators in the optical viewfinder confirm recording mode and focus position and warn of low battery charge.

A new one-hour rechargeable battery is 50 percent lighter than the previous one and clips onto the back of the CCD-M7U. This is the first camcorder that can run on dry cells: The optional EBP-55 battery case holds six AA alkaline cells that can provide an hour of recording time for occasions where AC power is unavailable for charging the nicad pack.

Included with the camcorder as part of the "Pak 7" system are the EV-P10U playback deck and a molded plastic carrying case. The deck has both RF and direct audio-video outputs for connection to any television, as well as an edit switch to enhance dubbing to other decks of any format. It can also operate portably with the rechargeable battery pack. Suggested retail price for the entire Pak 7 system is $1,450. For more information, contact Sony Corp., Sony Dr., Park Ridge, N.J. 07656.

**RABBIT OFFSPRING**

RABBIT'S SECOND VIDEO PRODUCT (THE FIRST IS a VCR signal-distribution system) is called Double Play, and it is basically a TV tuner that connects to any existing TV to provide "digital" effects such as picture-in-picture and freeze frame. (We tested the first product of this sort, the Multivision 3.1, in our March issue.)

The Double Play superimposes a second broadcast station or a videotape picture in a small box in any corner of the TV screen and can freeze the smaller picture or "swap" it with the main picture. Using the unit's remote control, this enables viewers to keep track of two programs at once and instantly switch either one to the full screen. The tuner can be programmed to scan through chosen stations on the mini-screen and can display the channel number on command. Price is $229. For more information, contact Rabbit Systems, 233 Wilshire Blvd., Santa Monica, Calif. 90401.

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mance of the AM tuners in home equipment is (with one or two exceptions) so poor that few people ever consider using them for anything but news or sports broadcasts, which is why we don't bother testing them. If this situation ever changes, so will we.

—Ed.

STATION IDENTIFICATION
In the April "Crosstalk," Larry Klein comments on the common practice of FM stations shortening their on-air frequency IDs. You should be aware that a broadcast outlet can identify itself in any way it wishes except at or near the top of each hour, when it must give its legal station ID, including call letters and community of license. Deregulation has eliminated most other requirements, though stations still may not use false call letters.

"The reader to whom Mr. Klein was replying listens to a fairly crowded FM band in San Diego; hence, frequency identification there is less outlandish than it can be in small markets like my own, where a station at 101.5 MHz bills itself as "FM 101." With the increasing market penetration of digital-readout tuners, the smart programmers in radio are leaning toward more specific identification, and even the "lucky" stations are calling themselves "106-9 KMOK-FM," for example. Now, if we can just get those guys to stop dubbing all their music to endless-loop tape cartridges!"

Don McKay
Program Director, KRLC
Lewiston, Idaho

UNITY-GAIN EQ
In April's "Crosstalk," Larry Klein writes that "the improved headroom of today's equalizer designs has obviated input/output matching." I think this is misleading advice. True unity gain assures maximum headroom with the least possible noise and distortion. I see no reason to give up any of the performance I have paid for or to risk damage to my system.

The benefits of unity gain are easily seen on an oscilloscope. If the output voltage is greater than the input voltage, severe clipping—possibly enough to damage other components in the system—is likely. Very minor clipping may cause no damage, but it will affect the sound of the music being played. In either case, the result is undesirable. If the output level is less than the input voltage, no clipping will occur, but components following the EQ will not realize their full potential. Either way, when true unity gain is not achieved, the true music is not heard.

Daniel P. McCann
Pittsburgh, Pa.

We agree that it is desirable for an equalizer to be set for overall unity gain. (As Klein noted, input/output matching "still represents good practice... because it minimizes the possibility of amplifier and speaker overload at strongly boosted frequencies.") However, modern equalizers usually deliver 10 or more volts without clipping—far greater than the inputs they are likely to see, which typically range no higher than 1 or 2 volts. And reducing the overall output level is unlikely to increase noise perceptibly unless the cut is fairly large (greater than just a few dB).—Ed.

COSTLY REPAIRS
My receiver recently went dead in one channel and I brought it to a local authorized repair shop. They charged me $75 to repair a unit that cost $300 when new. My friends tell me similar stories. Are the repair-shop owners trying to get rich at the expense...


**LETTERS**

of the consumer—and why don’t the manufacturers do something about it?

John Taylor
Boston, Mass.

Contributing Editor Larry Klein replies: We live in a time when very complex electronic devices are manufactured by automated machinery controlled by computers. This is why you can buy a digital watch or a pocket AM/FM radio for well under $10. But the reduction to the vanishing point of the expensive hand-assembly component of today’s electronic devices is of no help when the unit needs repair. Repairs continue to be very labor-intensive—and involve skilled, trained, and expensive labor at that. In short, although electronic products are built by the most sophisticated automated assembly techniques available in history, the only way they can be repaired is by the equivalent of an 18th-century handicraft approach. And today, that’s expensive!

WHITHER GARRICK OHLSSON?

I am a fan of Garrick Ohlsson, who has not produced a new recording on the Angel label for several years. He is one of the most versatile pianists playing today, and it had been my hope to replace all of his records with Compact Discs. No such luck. I wrote to Angel and received a very brief letter saying that there would be no new recordings and no CDs of his old recordings. No reason given. To me, it is unbelievable that the label would just cancel a contract with an artist of Ohlsson’s stature.

Do you know why Angel no longer represents him on records? Also, what would it take to encourage London, for example, to buy up the original Angel tapes and reissue them as CDs on their own label?

Recently, I learned that Ohlsson had just recorded the Scriabin Piano Concerto on some new label. Do you know anything about that?

Robert S. Deolitte, Jr.
San Francisco, Calif.

The main reason any record label decides not to renew a contract with an artist is that the records didn’t sell. For the same reason, don’t expect London to pick up the Ohlsson masters from Angel for reissue on Compact Disc. However, Ward Botsford of Arabesque Records informs us that Ohlsson has signed a recording agreement with his company for four records. The first, due in the fall of 1987, will be the first volume in a series devoted to the solo piano music of Carl Maria von Weber. (The sessions took place April 9–11.) The remaining three releases will consist of the Dutilh Concerto, to be recorded with the Czech Philharmonic; the Brahms Concerto in B flat, with the Gewandhaus Orchestra of Leipzig; and volume two of the Weber. According to Botsford, the Scriabin Piano Concerto was recorded in Czechoslovakia for Supraphon—which, incidentally, is not a new label—Ed.

LOOKING FOR LA BANDA DI CHIETI

After many years of almost fruitless search, I would appeal to any of your readers who are in possession of Victor (scroll Series) or Decca Blue Label 78s of a symphonic band that toured the United States in 1933 and 1934 under the name La Banda Di Chieti, directed by Nicola Santarelli. They were guests at the Chicago World’s Fair and created a sensation on their world tour. They performed at the Syria Mosque here in Pittsburgh at the time, and many old-timers still talk of their performance.

Senlensin E. Silvestri
Vandergrift, Pa.

Letters should be addressed to The Editor, Hi-Fi Forum, 825 7th Ave., New York, N.Y. 10019. All letters are subject to editing for brevity and clarity.

**PERFECT MARRIAGE**

New SA-XG is TDK’s exclusive SA-X formulation—the world’s quietest tape—technonomiously joined together with TDK’s most sophisticated mechanism ever—the RS-II.

Our unique 3-layer RS-II mechanism is specifically designed to suppress the generation of modulation noise. A precision die-cast alloy frame and molded tape guide block are sandwiched between two transparent precision-molded shell halves made of a special hard plastic, which also incorporate 4 precisely machined metal guide pins. The RS-II’s rigidity of construction, accuracy of fit and superior thermal resistance assure unerring tape travel, optimum tape-to-head contact and reduced modulation noise. The result is virtually true-to-source sound quality.

So whether you choose the outstanding SA-XG, or SA-X, with its new vibration-dampening Dual Layer Mechanism (DLM), you can be assured of one thing: An everlasting high bias honeymoon—till decibels do you part.
Matthew Polk's Awesome Sounding SDA-SRS & SDA-SRS 2

Matthew Polk's SDA SRS and SRS 2 have both won the prestigious AudioVideo Grand Prix Speaker of the Year Award.
The Genius of Matthew Polk Has Created Two Awesome Sounding Grand Prix Award Winning SDÅ SRSs

"Spectacular...it is quite an experience"
Stereo Review Magazine

Matthew Polk’s own dream speakers can now be yours!

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 signature features of the SRS without significantly compromising its awesome sonic performance. The extraordinary new SRS 2 is the spectacularly successful result. Music lovers who are privileged to own a pair of either model will share Matthew Polk’s pride every time they sit down and enjoy the unparalleled experience of listening to their favorite music through these extraordinary loudspeakers, or when they demonstrate them to their admiring friends.

“Exceptional performance no matter how you look at it”
Stereo Review

Listening to any Polk True Stereo SDA is a remarkable experience. Listening to either of the Signature Edition SDA's is an awesome revelation. Their extraordinarily lifelike three-dimensional imaging surrounds the listener in a 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 originally smooth, natural, low distortion reproduction. Nicholas B. Jr. of Loudspeaker Magazine 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 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 the sound”
Stereo Review

Both the SDA-SRS and the SRS 2 incorporate Polk’s incredible sounding/affordably priced Monitor Series loudspeakers which reproduce music with a precise, life-like three dimensional soundstage which is unequalled and gives you, as Julian Hirsch of Stereo Review summed it up, “literally a new dimension in sound”. Each beautifully styled and finished SRS 2 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. It is rated to handle 750 watts. The SRS utilizes 8-6½” drivers, a 15” sub-bass radiator, 4 Polk tweeters and an even more complex crossover. It is rated to handle 1000 watts.

Both the SDA-SRS and SRS 2 incorporate: 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 $995, 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.

Where to buy Polk Speakers? For your nearest dealer, see page 75.
REMEMBER THE RECEIVER? IT ALMOST GOES
without saying that what was originally con-
ceived as a one-box alternative to a separate
amplifier and tuner has become the flag car-
rier in the march toward audio-video inte-
gration. Even traditional audio manufactur-
ers have fallen in line with hybrid products,
further strengthening the once-innocent re-
ceiver’s role as the fundamental building
block of an audio-video system.

FIVE FROM YAMAHA. Yamaha’s new line of
receivers is headed by the RX-1100U
($940), a 125-watt-per-channel (21.0 dBW)
model that uses the company’s Absolute
Linear Amplification (ALA) circuitry, a vari-
ation of negative feedback that the company
claims provides improved distortion cancel-
lation. Features include controls for level
and detail of video signals, selectable IF
bandwidth and a fine-tuning control for the
tuner, three sets of speaker terminals, and an
infrared remote that also operates other Ya-
maha RS Series audio components.

The RX-900U ($699) is a similar 85-watt
(19.3-dBW) model that has two sets of
speaker outputs and a video level control, but no video detail control and no LED indi-
cator on the volume control knob.

At $549, the 65-watt (18.1-dBW) RX-
700U is a slightly pared-down version of the
RX-900U that employs Yamaha’s conven-
tional amplifier circuitry but retains the
video level adjustment and RS-compatible
remote control.

Next down the line is the RX-500U
($379), rated at 50 watts (17.0 dBW) per
channel and including an independent re-
cording output selector and inputs for two
tape decks and a video sound source. It has a
dedicated remote that controls volume lev-
el, selects input sources, and skips through
the tuner’s station presets.

The rotary volume knob on all four of
Yamaha’s remote-control receivers is mo-
tor-driven, which affords level changes in
smaller increments than are typical with up/
down electronic volume controls, as well as
lower noise.

Finally, the only nonremote model is the
37-watt (15.7-dBW) RX-300U, which at
$269 features Yamaha’s variable loudness
control and connections for two pairs of
speakers. The dynamic headroom for both
the RX-300U and RX-500U amplifier sec-
tions is given as more than 2 dB.

For more information, contact Yamaha
Electronics Corp., 6660 Orangethorpe Ave.,
Buena Park, Calif. 90620.

THREE FROM ONKYO. Actually, five. Two of
the new receivers from Onkyo, the 60-watt
(17.8-dBW) TX-84 ($450) and the 45-watt
(16.5-dBW) TX-82 ($350), come with either
a dedicated remote control or, for $80 more,
the company’s new RC-AV1M Universal
Programmable Remote (as the TX-84M and
TX-82M, respectively). The RC-AV1M is
preprogrammed to operate both of the re-
ceivers and most Onkyo cassette decks, turn-
tables, and CD players. Because it can mem-
orize more than 100 functions of other infra-
red remotes, however, it can serve as the
single controller for an audio-video system,
regardless of brand. Correspondingly, the
RC-AV1M is also sold separately for $120.

The TX-84 and TX-82 include connec-
tions for two tape decks and two video
sources, with dubbing possible either way
within each pair. A Selective Tone Control
(a.k.a. loudness compensation) applies a
variable level of boost simultaneously to
lower and upper frequencies. Two effects in
the TX-84 are geared for video-sound set-


YAMAHA'S TOP-OF-THE-LINE RX-1100U RECEIVER INCLUDES VIDEO LEVEL AND DETAIL CONTROLS

ONKYO'S TX-84 IS AVAILABLE WITH EITHER A DEDICATED OR A PROGRAMMABLE REMOTE CONTROL.
solve this muddling of sound arrivals by actually creating another "sound." This special impulse cancels the objectionable second sound arrival, leaving only the original sound from each loudspeaker.

The result is a vast sound field extending not only wider than your speakers, but higher than your speakers as well. Sounds will occasionally seem to come from behind you! It is as if a dense fog has lifted and you suddenly find yourself in the midst of the musical experience. Or, as the Senior Editor of a major electronics magazine put it, "When the lights were turned out, we could almost have sworn we were in the presence of a live orchestra."

**CARVER CD AND TUNER INNOVATIONS EXTEND THE POSSIBILITIES.**

Any stereo source can be transformed from monochromatic flatness into vibrant three-dimensional reality with Sonic Holography.

Compact discs afford vastly increased dynamics, frequency response and freedom from background noise. Yet their potential is trapped in the 2-dimensionality of conventional stereo. Sonic Holography can surround you with the drama and impact of digital. (And the Carver Compact Disc Player with Digital Time Lens sound correction circuitry can enhance your listening experience even further).

Thanks to the Carver Asymmetrical Charge-Coupled FM Stereo Deflector, FM stereo broadcasts can be received with vastly increased fidelity. Hiss and interference-free, any signal from chamber music to live rock concerts, can take on an astonishing presence and dimension through Sonic Holography.

The new Carver TX-11a AM/FM tuner delivers AM stereo broadcasts with the same dynamics and fidelity as FM. A perfect source for the Sonic Hologram Generator. Think of it: AM can actually become a three-dimensional phenomenon through Carver Technology!

**SONIC HOLOGRAPHY PUTS YOU INSIDE THE VIDEO EXPERIENCE.**

More and more people are discovering what theaters discovered some time ago. Audio makes a huge contribution to the realism of video. Still, it has taken the incredible, near-digital quality of VHS and Beta Hi-Fi to make the marriage of audio and video truly rewarding. Now even rental movies fairly explode with wide frequency range, dynamic impact and conventional stereo imaging.

Add the steady emergence of stereo TV broadcasts by all three major networks of prime time programming and special broadcasts, and you have fertile ground for the added realism that only Sonic Holography can deliver.

Unlike so-called "surround sound", a Sonic Hologram Generator puts you into the middle of any stereo soundtrack, (stereo, Hi-Fi stereo, broadcast stereo or even simulcasts). It psychoacoustically expands the visual experience with life-like sound that envelops you in the action.

Once you've heard Sonic Holography with a good video tape or LaserDisc, you'll never go back to mere stereo again.

**ENHANCE YOUR SPACIAL AWARENESS WITH FOUR CARVER COMPONENTS.**

The patented Carver Sonic Hologram generator circuit is available on two preamplifiers, our largest receiver and as an add-on component. Each can transcend the limits of your listening (and viewing) room. Each can add the breathtaking, spine-tingling excitement that comes from being transported directly into the midst of the musical experience.

Before you purchase any component, consider just how much more Carver can enrich your audio and video enjoyment. And then visit your nearest Carver dealer soon.

The Carver Sonic Holography quartet. Pictured from left to right is the 4000t Preamplifier, the C-9 sonic Hologram Generator, the Receiver 2000 with remote control and the C-1 Preamplifier.

Distributed in Canada by Evolution Technology
**SOFT PACIFIC**

Paul Moor's Review of *South Pacific* [April] was by far the kindest and most generous critique of this horrible travesty of an album I've read so far. I could hardly believe my eyes when I read Moor's comment that Mary Martin sang "certain passages" better than Kiri Te Kanawa.

"Certain passages"? Mary Martin sang every blessed note a billion times better, and so did Mitzi Gaynor! Te Kanawa is lost on this recording, and her renditions range from ill-considered to downright embarrassing. As for José Carreras... his cromming of "Theece Nee-ahr-ly Iwasse Mine" and his other numbers sounds about as much like a French planter as José Jimenez.

I thoroughly resent the bald-faced lie on the cover claiming the London Symphony Orchestra played the album when, in fact, all we get is a tinny, theater-crossed band from that orchestra. CBS's stupid cardboard-box packaging of the CD with an outsize program book that won't fit in the jewel box adds the final coup de grâce.

CBS should drop this mess from its catalog and issue public apologies to Rodgers and Hammerstein's heirs.

**David Green**

Houston, Texas

**IN DEFENSE OF BAKER'S ROMEO**

I would like to take issue with a remark made by Thor Eckert, Jr., in his review of the new Gruuberova/Baltsa recording of Bellini's *I Capuleti e i Montecchi* [May]. In referring to EMI's earlier recording of this opera, made in the '70s, he stated that it "put Sills against the hopelessly miscast Janet Baker." Baker's Romeo, obviously studied with care, was sung with an intensity that was a hallmark of the many recordings she made. Although I own the new CD recording of this beautiful opera, I find myself reverting to the Sills/Baker recording, which, to my ears, is a performance that has stood the test of time.

**Gerardino Segal**

Randallstown, Md.

**SURROUND-SOUND PATENTS**

Thank you for your mention in the April issue's coverage of the Winter Consumer Electronics Show. But one point needs to be straightened out: The high-separation surround "logic" that I have licensed to Dolby Laboratories was by no stretch of the imagination originally developed for SQ matrixing. We are talking about patent licensing. The fact that the patent had already been issued was a precondition of negotiating the SQ license under it. Beyond that, Gilsaid it its way. The rest, as they say, is history.

As your article states, I have a special relationship with Shure Brothers, which has a direct license with Audiodata conferring certain rights under my patents (beyond the rights sublicensed by Dolby to every manufacturer of consumer Dolby Surround equipment). Another company that has a customized license under my surround patents is Fosgate, Inc., which is also licensed to use my new 360° Space Matrix technology (patent pending).

**Peter Scheiber**

Managing Partner

Audiodata Co.

Bloomington, Ind.

We received your April issue and noted Robert Long's comments regarding surround sound at the Winter CES as well as his comments regarding Peter Scheiber, his patents, and his relationship with Shure Brothers. We would like to point out that Peter Scheiber currently has an exclusive arrangement with Fosgate, Inc. The only collaborative work Peter has done in recent years has been with Jim Fosgate on the 360° Space Matrix.

As Long notes, Peter Scheiber does own the major patents in the field of matrix surround processing. He has licensed Dolby Laboratories to use the patents for both encoding and decoding applications (Dolby Stereo and Dolby Surround). More recently, Peter concluded an additional licensing agreement with Dolby Labs to allow them to sublicense a basic logic circuit for the MP Matrix. This system will be known as Dolby Surround Pro Logic. The new license restricts Dolby to sublicensing for MP Matrix applications only.

Currently, only Fosgate and Shure Brothers have separate licenses with Peter that allow them to use "logic" circuitry in their home products. In the case of Shure Brothers, Peter simply licensed them under the patents and the company developed its own circuitry, Fosgate, on the other hand, has worked closely with Peter over the last several years. The results have been the 360° Space Matrix and the 360° Digital Space Matrix, as used in the DSM-3602, our current state-of-the-art surround audio processor.

**Charles Wood**

Marketing Manager

Fosgate, Inc.

Heber City, Utah

We have requested samples of the Fosgate DSM-3602 for review.—Ed.

**WINE, WORDS, & WRONG DEFINITIONS**

The overall analogy at the foundation of Rich Warren's "Wine, Words, & Song" [March] may be a good one, but the definition given for "talebot rot" is incorrect. It is not "a disaster if it appears prior to the fermentation process." Noble rot, or Botrytis cinerea, is a fungus that is indeed beneficial, even essential, to the making of some wines, specifically the very sweet wines of Germany and France. But this fungus attacks the grapes while they are still on the vine, resulting in a drying of the grapes and a concentration of their sugar content before harvest. This most certainly occurs prior to fermentation.

**Thomas Allison**

Brooklyn, N.Y.

**8mm INCONSISTENCY**

It is ironic (not to mention inconsistent) that at the same time the electronics industry is encouraging us to upgrade our TV sets to stereo it expects us to pay a premium to downgrade our VCRs to mono ["Why 8mm?", February]. I find it incomprehensible that a magazine calling itself High Fidelity is pushing the mono 8mm format. You should push for a stereo 8mm format (or change your name to High Video Fidelity/Low Audio Fidelity).

**Don Schmidt**

Atlanta, Ga.

All of the consumer VCR format standards, including the one for 8mm, require a mono audio track and offer stereo as an option. The system used for recording stereo audio on 8mm videotapes was described in the "Why 8mm?" article. And we are not pushing the 8mm format, just reporting on it—as we will do with any promising new video developments.

—Ed.

**AUDIO-VIDEO RECEIVERS**

Your reply to Timothy Hendeii's letter [March] is incorrect. The Wintec R-1060 was the first receiver to include a TV tuner. I owned one for about five years and then got a Technics SA-550, which also has a built-in TV tuner. Both were mono, but Technics brought out a receiver with a stereo TV tuner the year after the SA-550.

**Dan L. Atkins**

Reading, Pa.

We thought Mr. Hendel was referring to receivers containing tuners that handle the video as well as the audio portion of a TV broadcast. We are not familiar with the Wintec, but the Technics receivers did not have that capability. The Jensen ATS-1500 did.—Ed.

**WHY NO AMT?**

I am a stereo-am enthusiast, so it bothers me that you rarely give any consideration to the performance of the AM tuner sections in the equipment you test. Why not?

**Thomas England**

Dayton, Ohio

We do test the AM tuners in car units and comment on their performance, but only because FM reception is not always possible on the road. The perfor-
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FX vs. HIGH-TECH

BY MICHAEL RIGGS

B) FX, I MEAN FOREIGN EXCHANGE, YOU'D HAVE TO HAVE been living underwater for the last six months not to know that the dollar has taken an express elevator to the currency basement. As I write this, you can change money at a rate of less than 110 yen to the dollar; the last time I was in Japan, about two years ago, a dollar would buy you 250 yen. We're looking at a drop of more than 40 percent, at least relative to Japanese currency.

But in the world of consumer electronics, this is the key conversion, because most of the audio and video equipment sold here is made by Japanese companies. So you would expect prices for everything from receivers to VCRs to be going straight up. Yet at the Winter Consumer Electronics Show in January, prices overall were, if anything, a little down. And initial indications are that we'll be seeing more of the same at the Summer CES.

There are two main reasons for this. One is increasing reliance on manufacturing in countries with lower labor costs or local currencies that enjoy a more favorable rate of exchange with the dollar. Sony, for example, builds most of the television sets it sells here in California. Another is fear of lost sales or market share (particularly to Korean and Taiwanese competitors) and the production cutbacks that such setbacks would ultimately entail. The Japanese aversion to production slowdowns is legendary. It is said that during the big recession at the beginning of the decade, the American distribution arm of one major Japanese audio manufacturer scrapped large amounts of equipment because its parent company wouldn't match supply to the retail sales rate and warehousing the overflow was too expensive.

In short, the Japanese are gritting their teeth and hoping that better days come before bankruptcy. However, the consumer doesn't get a completely free ride. We've grown accustomed to rapid advances in technology and equally swift migration of new developments from expensive showpieces to affordable products. At the very least, part two of that expectation will have to change. When and if Super VHS and DAT arrive here, the machines will be costly—in the $1,200 to $2,000 range. And though prices eventually will drop, they probably will come down more slowly than they did for CD players and ordinary VCRs and bottom out at a significantly higher plateau. Japanese manufacturers may not feel that they can raise prices substantially on established products, but neither will they feel free to cut them on new entries with the abandonment of years past.
The tuner section also behaved very well in our road test. FM "spitting"—as we have been calling the burst of noise and distortion typically produced by weak and varying signal strength combined with high and fluctuating multipath—was almost inaudible. Subjectively, reception suffered more from distortion than from noise and more from unstable, phasex stereo imaging than from either of the other ill. Because the 7902 has a mono/stereo switch (not all models do, unfortunately), the imaging problem is easy to banish on weak stations, and neither of the other problems is severe. FM listening quality was therefore judged well above average.

The tuner separation and quieting curves suggest the reasons for these conclusions. The latter remain admirably low, right down to minute radio-signal strengths. They are kept there partly by attenuating overall output (the top curves on the graph) somewhat more than usual—which of course attenuates the noise along with the signal—and stereopho, by blending channels rapidly below signal strengths of about 40 dB. This rapid blending produces unstable imaging with fluctuating signal strength.

Technically, the stereo sensitivity is a very respectable 34 dB; we omitted the figure from our data column because 1-kHz channel separation at that input level is only 69 dB—arguably, no longer true stereo, although it's enough to deliver some stereo effect. Since this reduction in separation is important in keeping weak signals listenably quiet, some front ends offer even less separation at the same rating point.

There is a local/distant (DX) switch on the front panel, but it affects only the sensitivity of the station-seek function, not the actual tuner performance. You can seek out all receivable stations or only strong ones, but whatever you tune to will be received with maximum sensitivity and so on (the approach we prefer). The remaining data all are typical of good after-market gear. Frequency response droops slightly toward both frequency extremes (and retains the very slight downward slope toward the upper end we noted for CDs), but is flatter than was once the rule in home gear only a few years ago. The response figures shown below the graph were measured in mono, while the droop is a hair less in stereo.

The AM section is fairly typical of the front ends we test: It has been designed for speech intelligibility, rather than sensuous sound. The restricted bandwidth and steep high-frequency cutoff help suppress the artifacts that plague weak AM reception. Most notable is the superb selectivity figure, which is better than we can document reliably and is thus shown simply as greater than 100 dB. Not surprisingly, we judged the AM listening quality better than average.

The 7902's overall response is the same as that of the CD section, which means that its slight departures from flat response should be attributed to the preamplifier, with the tone controls at their detents, rather than to the CD section's own circuitry. The tone controls themselves offer more than minimal adjustment range. The bass is most affected at about 40 Hz, where it can attain about 13 dB of cut or boost. In the treble, the maximum range is about ±11 dB at 15 kHz.

We see car CD players as the way of the future. Other models will surely come along to rival the 7902's single-chassis format and probably its performance, but few will be able to rival its exceptional ease of operation. The controls that really matter—meaning nearly all of them—are clearly differentiated, intelligently grouped, well illuminated, sized for adult human fingers, and attractive. And that in itself is a triumph.
As we go to press (early May), the legislative fate of Copy Code coding is still unknown. But whatever the outcome, the contents of this article will remain relevant and vitally important to audiophiles and music lovers. If the bills that would require inclusion of Copy Code scanners in DAT recorders are defeated, they are almost certain to be reintroduced in the next session of Congress. The issue will not just go away. If the bills become law, it will be important to understand their significance and to campaign to have the restrictions lifted, for the good of everyone. —Ed.

It all started in 1979, when researchers at the now-defunct CBS technology center in Stamford, Connecticut, were directed to find a method of stopping unauthorized copying of records and tapes. After experimenting with inaudible signals that would disrupt the recording process (then only analog), and after not finding any method that did not require the addition of circuitry to the recorder, they came up with what CBS calls Copy Code. Although the system does require a detector in the recorder, it was CBS’s hope—and is now the hope of much of the record industry—that a law would be enacted to require such circuits in tape recorders, including analog and digital audio decks and VCRs. One such proposed law (which is being advanced in several bills with nearly identical wording) is the Digital Audio Recorder Copy Code Act of 1987, whose grand, sweeping edicts make for chilling reading to anyone familiar with
the most fundamental principles of high fidelity audio:

(a) No person shall manufacture, assemble, or offer for sale, resale, lease or distribution in commerce (1) any digital audio recording device which does not contain a copy-code scanner; or (2) any device, product, or service, the primary purpose or effect of which is to bypass, remove, or deactivate a copy-code scanner. (b) No person shall bypass, remove, or deactivate a copy-code scanner. [A copy-code scanner is] an electronic circuit . . . (A) which is built into the recording mechanism of an audio recording device; (B) which, if removed, bypassed, or deactivated, would render inoperative the recording capability of the audio recording device; (C) which continually detects, within the audio frequency range of 3,500 to 4,100 hertz, a notch in an encoded phonorecord; and (D) which, upon detecting a notch, prevents the audio recording device from recording . . . for at least 25 seconds . . . An "encoded phonorecord" is a phonorecord which has a notch within the audio frequency range of 3,700 to 3,900 hertz." . . . [A notch is] an absence of sound resulting from the removal of sound signals at a certain frequency. [italics added]

It boils down to this. To prevent unauthorized copying of any particular recording, all of its incarnations will have to be "notched"; its LP, cassette, and CD versions will have to have a "certain frequency" removed (filtered out). Unfortunately for the creators and consumers of recorded music, such antimusical processing would be, in the end, literally and figuratively self-defeating. (For a detailed technical description of Copy Code—and possible methods for defeating it—see the accompanying explanation, "Electronic Warfare." For a list of House and Senate Bills containing Copy Code legislation and the names of a few players in this matter, see "Sound Off," p. 51.)

FURY ABOUT SOUND

ON APRIL 2, IN TESTIMONY BEFORE CONGRESS BY THE RECORDING INDUSTRY ASSOCIATION OF AMERICA (RIAA), DAVID STEBBINGS (DIRECTOR OF RECORDING RESEARCH AT THE CBS RECORDS TECHNOLOGY CENTER IN MILFORD, CONNECTICUT) STATED THAT THE COPY CODE SYSTEM ENCODES ANY MASTER RECORDING "by removing a sliver of sound from the music." He further claimed that "listeners cannot distinguish an encoded recording from an unencoded recording" and that the encoding filter is "effectively inaudible and does not affect the quality of the music." And indeed, in a demonstration of encoding using a "notched" track from Barbra Streisand's The Broadway Album (a CBS CD, CK 40092), there was no immediately apparent difference between the filtered and unfiltered versions. But the sonic nature of the segment played would make the effects of the system hard to discern in any case, not to mention that the material was unfamiliar to many of the listeners in the room and that opportunities for comparison were limited and controlled by CBS representatives.

However, that was followed by an utterly convincing counterdemonstration of the audible sonic effects of the Copy Code filter by the Home Recording Rights Coalition (HRRC). The HRRC used a filter designed according to
may cause other sonic problems besides missing notes or altered musical timbres. A sixth-order Chebyshev filter made from biquad stages is a rather complex device, containing a dozen operational amplifiers. Each will add noise to the audio signal. Phase equalization of the filter would add further active components to the circuit and noise to the signal. Dynamic range will be further reduced by possible Substage overload. Depending on the input signal, one or more of the cascaded stages may overload before the final output does, thus adding distortion to the music. Making the filter a ninth-order design would only exacerbate these problems.

A Copy Code scanner is inherently more complex than even a ninth-order encoder filter, because it must reliably detect the encoded notch even if the recording is reproduced on an off-speed player, and more important, because it must avoid "false positives" that would halt the recording even if the source material were not encoded. As described in the March 1986 document, and shown here in a block diagram for the first time, CBS's version of a Copy Code scanner operates on the sum of the recorder's input channels. This sum signal is then fed through a "wide" bandpass filter (3,840 Hz ±375 Hz) so that the rest of the circuit "looks" only at the region around the notch frequency. A fast-acting automatic gain control compresses the filtered signal so that the following circuits see little variation in level. This is necessary to prevent the level-dependent detection circuit from being triggered by musical dynamics (it also lessens the circuit-quality requirements on the following stages).

The filtered and compressed signal is now split into two nearly identical paths. Both paths, with their rectifiers and integrators, serve to create slowly varying DC voltages. One path contains a narrow bandpass filter that is (or was) supposed to be identical in response to the encoding notch filter, so it generates a DC voltage the then-known parameters of the system. When a pure tone was swept through the frequency range of the notch—disappearing when it neared the notch frequency—the Congressmen, along with the assembled press and observers, could easily "distinguish an encoded recording from an unencoded recording." And when the notes of a scale played on a piano passed through the notched frequencies, the change in timbre was unmistakable.

In his testimony, Stebbings claimed that the HRRC filter was incorrect because the notch was too wide and was located at the wrong frequency. "It [the HRRC filter frequency] was placed on musical notes that were part of the recording in a way that overlapped with audible sound." In an unnecessary swipe at those who built the HRRC filter, Stebbings testified that "any competent audio engineer could have easily avoided any of these obvious mistakes, at least with CBS technology." That technology, however, was not generally available on April 2, because, as Stebbings admitted, "We have yet to release our [latest] technical specifications for the encoder to anyone outside the music industry." Nor is it available as of this writing (early May), despite Stebbings’s April 2 promise to Congress to make the system available for independent listening tests.

After that morning’s testimony was over, Stebbings, commenting to me on the HRRC demonstration, said, “You heard attenuation of the fundamentals of two piano notes. Now, on their document there, which they have produced, you’ve got the [minus] 3-dB points on the fundamental [of the piano note]. Now you know that if you change either a fundamental or an overtone on a piano by 3 dB, you’re not going to hear any difference. So I’m saying that "that demonstration was not even the spec he said it was. Believe me, our encoder wouldn’t make that sound effect on a piano."
temperament ratio would dictate. This stretching is necessary to bring the fundamentals of the high notes into consonance with the harmonics of lower notes. Those harmonics are moved up in pitch by the characteristics of piano strings (they have some stiffness, which shifts the harmonics slightly from being simple multiples of the fundamental frequency).

Using a middle C of 261.626 Hz, a typical grand piano’s highest equal-tempered A sharp will be not tuned to a calculated 3,729.31 Hz, but to around 3,783 Hz (half a quarter-tone higher). Stebbings’s post-testimony claim to me was at best dubious: A Copy Code encoder will not attenuate the fundamental of a piano’s high A sharp by only 3 dB. Instead of being 111 Hz away from the filter’s center frequency, that note is only 57 Hz away and will be virtually obliterated by the encoder, causing a change in timbre. This is precisely what was heard in the HRRC demonstration. Granted, not all piano works explicitly call for such high notes, but those that do (including works by Liszt, Debussy, and many contemporary composers) will have the musical effect ruined as a player hits a clanging high A sharp (or B flat). Other acoustic instruments (such as pipe organs, glockenspiels, xylophones, and violins) as well as electronic synthesizers generate fundamental frequencies straddling the pitch of the Copy Code filter, and their sound quality would also be at risk when passed through it.

And not only the high A sharp or B natural will be altered. All the notes for whose fundamentals 3.84 kHz is a harmonic will be changed, perhaps audibly so, and especially if the instrument being used is not tuned to standard modern pitch. As you start examining these submultiples of 3.84 kHz, you immediately enter regions for which a great deal of music has been and is being written. The Copy Code filter is close to the third harmonics of the D sharp and E natural two octaves above middle C. These two pitches occur very often in, for example, flute and violin music (see Fig. 2). A violinist using vibrato while playing one of these pitches, say, in the Bach, Beethoven, or Brahms violin concertos, could sweep the third harmonic of the instrument’s sound through the frequency of the Copy Code filter, with disconcerting changes in timbre a distinct possibility. Stress and may escape sonic mutilation, but the classical “Three Bs” will not. Performances using historical “original” instruments are often performed below modern standard pitch, so that the instruments’ harmonics stand a good chance of falling directly into the abyss. Historical pipe organs are tuned in all sorts of non-equal-tempered systems to all sorts of standard pitches. Many orchestras deliberately tune sharp for a more brilliant tone quality. For example, the Boston Symphony is said to tune its A to 442 Hz instead of 440 Hz. At the top A sharp, this 2-Hz difference has been magnified to more than 16 Hz, pushing the whole ensemble’s fundamentals and harmonics closer to the notch frequency.

There are few, if any, types of music whose pitches would conveniently avoid Copy Code’s musical black hole. You don’t have to be a graduate student in ethnomusicology to understand that any culture whose music contains much pitch inflection (Indian, Chinese, and Japanese classical music and good old American jazz spring immediately to mind) will generate fundamentals or harmonics that will eventually slide into the notch. If, as Jan Timmer (President of Corporate Management at Polygram International) believes, home taping represents “cultural vandalism,” then the Copy Code system, with its claims to inaudibility poorly founded on the equal-tempered scale, equally signifies cultural demagoguery. All told, it is impossible to design a dependable Copy-Code-type anticopy system whose encoding will filter all music without audible damage. Indeed, for the Copy Code system to operate at all, the music must originally have some information at and near the notch frequency.

UNFINISHABLE SYMPHONY

The record companies supporting Copy Code (not all do) seem willing not only to distort, perhaps grossly, the very product they are trying to protect, but also to impose a form of culturally biased musical censorship. If the system is required by law, a composer or arranger will not be able to write certain notes with the assurance that they will emerge in recorded performance without some form of sonic impairment. What if, in order to achieve a certain musical effect, a composer needs to sweep a tone through the frequencies of the Copy Code notch? (This happens occasionally in synthesized pop music and in the Onudes Martinet part in Messiaen’s Turangalila Symphony.)

If the Copy Code system is indeed so audibly innocuous as to “not affect the quality of the music,” why has CBS steadfastly refused to release those relevant technical details on the system that would enable independent listening tests? Where are the artist endorsements like the ones that accompanied the release of the CD system? Otherwise the whole circuit is reset and the search process repeated. The long wait is supposed to be the final guarantee against false detections, since it is unlikely (or so CBS thinks) that unencoded music will have a naturally occurring notch in its spectrum that lasts 13 seconds.

From this detection scheme, one can conclude that attempts to further narrow the encoding filter will not only increase that filter’s ringing but will probably also increase the number of false alarms in playback. The narrower the slice taken out of the music spectrum, the less likely it will contain any signal to remove and the more likely that the recorder’s scanner will represent the signal level found in the frequency range of the encoded notch. The other signal path’s DC voltage represents the level of the frequencies around the notch.

The CBS description states that “if the music is not encoded, then the DC outputs from the first and second integrators will be the same. If, however, encoded music is used, then the DC output of the first integrator will remain at a small value, whereas the output of the second integrator will be much greater. By using a comparator, which detects the ratio of these values, within a preset margin of tolerance [also necessary to guard against false detections], the presence of the notch in the music signal can be determined.” The control circuit has several functions. First, it sweeps the center frequencies of the scanner’s bandpass filters by ±6 percent so that the notch will be detected even if the music to be copied is played off-speed by as much as one musical semitone. When a notch has been detected during a sweep, the control circuit “freezes” the filter center frequencies and switches the integrators from a search-mode averaging period (80 milliseconds) to a long averaging period (13 seconds). If, after 13 seconds, the scanner still detects a notch, the circuit will signal the recorder to stop taping.

Otherwise the whole circuit is reset and the search process repeated. The long wait is supposed to be the final guarantee against false detections, since it is unlikely (or so CBS thinks) that unencoded music will have a naturally occurring notch in its spectrum that lasts 13 seconds.

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deem a naturally occurring notch the result of encoding.

From the complexity of the scanner operation, one can guess how CBS plans to turn the circuit into an integrated "chip" form (which, as of this writing, has not yet been done). If a filter similar in complexity to the encoding filter is to be used in the scanner—and especially if its center frequency is to be swept—then there is only one practical way the scanner can be produced. It will have to use switched-capacitor solid-state filter chip-manufacturing techniques. This is the only way such fine-tolerance variable-frequency filters can be made without using hand-selected parts or post-assembly trimming (which would make the chip cost much more than CBS's claimed $1).

**ELECTRONIC COUNTERMEASURES**

If, in a recorder, the Copy Code scanner function is indeed carried on a separate chip and is not incorporated as part of another vital IC (a likely proposition if it is done with switched-capacitor technology), it will not take long for methods of bypassing, deactivating, or disconnecting the scanner IC to become common knowledge. Actually performing these operations will be illegal if the legislation passes, but at least one way of getting around the Copy Code scheme may not be.

Since the CBS system is frequency sensitive (with a vengeance), all that's necessary to defeat it is a simultaneous shift of playback and recording speed beyond the ±6-percent search range of the scanner chip. Although CBS says provisions can be made for doubling the scanner filter frequencies (to stymie double-speed analog dubbing decks), it is not possible to account for the infinite number of possible playback/recording speeds—the scanner will be looking for the notch in the wrong place. Congress will also have to outlaw continuously variable speed controls on decks and players.

**THE ULTIMATE TURN-OFF**

Copy Code supporters, in addition to not realizing—or dismissing—the musical damage it may cause, also seem not to realize that requiring the installation of a Copy Code circuit in a digital-audio tape recorder (or, for that matter, in an analog deck or VCR) will be self-defeating. They have forgotten the history of the Dolby-encoded analog cassette: It, like DAT, is a medium pioneered by the high fidelity industry (Advent and Nakamichi, to be specific) and promoted by other performers whose work is to be shielded by the Copy Code system. Perhaps they haven't even heard of Copy Code. By advocating the system, are record companies presuming to speak for Liszt, Debussy, and the rest of the composing community?

Also strangely silent in this affair have been reputable audio engineers and designers, especially those of the CD system, many of whom work at Philips. I've observed them applying prodigious energy and brainpower toward the sonic perfection and operational reliability of that digital medium. I can't believe they would, on principle, allow their work to be so undone by Copy Code and not raise a fuss. Perhaps Philips's CD-system designers have been "reminded" that their employer also owns much of Polygram Records.

Based on a verbal description in a CBS document, our block diagram of a Copy Code scanner shows the distinctive dual path (upper right) the signal takes on its way to the comparator, the device that actually makes the record/dont-record decision. The circuit's provisions against false alarms make it vulnerable to jamming by several types of homemade circuits.
of music consumers.

Somebody will eventually have to pay for the development of the Copy Code chip, its manufacturing, and its incorporation into tape-recorder circuitry, as well as for the manufacturing and installation of encoders and the remastering of software through Copy Code filters. Since I can’t imagine the recording industry paying for all of this voluntarily, it is the music consumer who ultimately will bear these economic burdens. Furthermore, as the quality of prerecorded software is deliberately violated by the Copy Code process, the burden of musical damage will be borne by all sensitive listeners and musicians. Weingarten summed it up simply: “Attempts to control information flows too tightly may either fail or be so draconian as to be legally and socially unacceptable, as well as economically costly.” He might well have added: musically disastrous.

**COPY CODE COPS**

**SOUND OFF**


If you are handy with a soldering iron and are near a parts store, several more advanced countermeasures are possible. Those willing to sacrifice audio quality can build a filter with a very sharp roll-off above 3,500 Hz or a notch filter wider than the scanner’s first bandpass filter (that is, centered on 3,840 Hz and wider than ±375 Hz). Either will fool the scanner into thinking that the recording is unencoded. These filters would probably be illegal because they would not get around the legal prohibition on “any device, product, or service, the primary purpose or effect of which is to bypass, remove, or deactivate a copy-code scanner.” (Under this restriction, telephones would have to be banned too, since a primary effect of feeding an encoded signal over poor-quality phone lines would be to render it unprotected.)

The most sophisticated approach would have as its goal the “filling in” of the encoded notch without a substantial loss of audio quality. One way to do this is to add to each channel a band of deliberately generated harmonic distortion (or possibly only noise) at the notch frequency. The amount added would have to be automatically regulated, by some form of voltage-controlled mixing, so as not to sound unnatural. But here the anti-false-alarm provisions of the CBS scanner can be used to advantage. It is not necessary to constantly add distortion; it just needs to be mixed in often enough to make the scanner continually reset itself without triggering, perhaps only every 5 or 6 seconds. And since there is a 13-second “sweet spot,” the precise moment of the de-notchings can be selected by the jamming circuit so as to create little or no audible disturbance. While this method would be fairly complex and the circuit would have to be duplicated for each channel, it can be built from common off-the-shelf parts that would cost at most $75. It would cost even less if the timing of the mixing operation were controlled by a $1 Copy Code scanner chip!
A historical and technical guide to an important specification

MAXIMUM HEADROOM

BY LARRY KLEIN

A STEADY SUPPLY

OUR PRIMARY CONCERN WAS TO PROVIDE A TEST THAT WOULD FIT IN WITH THE THEN RECENT FEDERAL TRADE COMMISSION (FTC) RULINGS ON AMPLIFIER POWER MEASUREMENT (WHICH SURVIVE, AMONG OTHER PLACES, IN THE TEST ON AMPLIFIER POWER MEASUREMENT (WHICH FEDERAL TRADE COMMISSION (FTC) RULINGS WOULD FIT IN WITH THE THEN RECENT)

THE PURPOSE OF A POWER SUPPLY IN AN AMPLIFIER IS TO CONVERT THE HIGH-VOLTAGE ALTERNATING LINE CURRENT TO DIRECT CURRENT FOR USE BY THE AMPLIFIER CIRCUITS. AT ONE TIME, AND APPARENTLY STILL AMONG SOME MANUFACTURERS, IT WAS ENGINEERING-SCHOOL GOSPEL THAT A PROPER AMPLIFIER POWER SUPPLY WAS TO BE WELL-REGULATED ("STIFF," "HARD," OR "RIGHT"). SUCH A SUPPLY MIMICS THE BEHAVIOR OF A BATTERY: ITS OUTPUT VOLTAGE REMAINS AS RIGIDLY FIXED AS POSSIBLE SO LONG AS THE CURRENT BEING DEMANDED OF IT DOES NOT EXCEED THE SUPPLY'S CAPABILITIES. WHEN, ON THE OTHER HAND, THE OUTPUT VOLTAGE OF A POWER SUPPLY TENDS TO RISE AND FALL WITH THE CURRENT DRAWN FROM IT, IT IS REFERRED TO AS UNREGULATED, OR, LESS TECHNICALLY, "SOFT" OR "LOOSE."

THE IHF'S "MUSIC POWER" RATING (AND OTHER AMPLIFIER-POWER TERMS, SEE "POWER WORDS," P. 53.)

POWER TESTS

A QUICK REVIEW OF THE IHF PROCEDURES FOR TESTING AN AMPLIFIER'S OUTPUT POWER WILL HELP CLARIFY SOME OF THE ISSUES UNDER DISCUSSION. APPROPRIATE LOAD RESISTORS (OF 8, 4, OR 2 OMS AND A HIGH POWER RATING TO PREVENT MELTING) ARE CONNECTED ACROSS THE AMPLECTER'S RIGHT- AND LEFT-SPEAKER OUTPUT TERMINALS. ACROSS ONE CHANNEL'S LOAD RESISTOR (SAY, THE LEFT) ARE CONNECTED AN AUDIO VOLTOMETER AND A HARMONIC-DISTORTION ANALYZER. A SINE-WAVE SIGNAL GENERATOR IS CONNECTED TO THE INPUT JACKS OF BOTH AMPLIFIER CHANNELS. THE PRECONDITIONING MANDATED BY THE FEDERAL TRADE COMMISSION REQUIRES THAT BOTH CHANNELS BE OPERATED FOR ONE HOUR INTO THE RATED LOAD IMPEDANCE AT 33 PERCENT OF THE AMPLIFIER'S RATED OUTPUT POWER.

A CLIPPING HEADROOM MEASUREMENT IS OBTAINED BY RAISING THE LEVEL OF A CONTINUOUS SINE WAVE, AS USED IN THE CONTINUOUS AVERAGE POWER MEASUREMENT, UNTIL THE AMPLIFIER OUTPUT CLIPS. THE RATIO (EXPRESSED IN DECIBELS) OF THE VOLTAGE REACHED TO THAT OBTAINED IN THE CONTINUOUS AVERAGE POWER RATING IS THE AMPLIFIER'S CLIPPING HEADROOM.

MEASUREMENT OF DYNAMIC HEADROOM IS ACCOMPLISHED BY USE OF A SPECIAL SIGNAL: A 1-KHZ SINE WAVE THAT JUMPS UP 20 DB IN LEVEL FOR 20 MILLISECONDS (1/50 SECOND) EVERY HALF SECOND. THIS IS LED TO THE AMPLIFIER, AND THE MAXIMUM OUTPUT VOLTAGE OBTAINED WITHOUT CLIPPING THE 20-DB BURSTS IS RECORDED. THE DYNAMIC-HEADROOM RATING ITSELF IS THE RATIO (EXPRESSED IN DECIBELS) OF THE AVERAGE POWER OF A SINE WAVE HAVING THE SAME PEAK-VOLTAGE LEVEL AS THAT OBTAINED WITH THE SPECIAL TEST SIGNAL TO THE AVERAGE CONTINUOUS POWER.


L.K.
the instructions for how to obtain it) in the 1966 standard was a poorly conceived attempt to recognize that soft power supplies actually can be beneficial. A well-designed unregulated supply can cost less and yet may provide large amounts of power for short periods—following the dynamic range requirements of music, which is mostly rather quiet but contains frequent large, short-duration peaks. An amplifier with a continuous-output rating of, say, 40 watts (16 dBW) but that is able to deliver 80 watts (19 dBW) of power on a short-term basis is likely to sound better (because it is not clipping) on high-level musical transients than an otherwise identical amplifier that, because of its tightly regulated power supply, has a lower maximum short-term output. Of course, an amplifier that is able to put out 80 watts continuously can play louder (by 3 dB) than another amp that can achieve 80 watts only for brief periods, but it would probably be more expensive. But without some kind of dynamic-power rating, there would be no recognition of those amplifiers that could deliver musically significant amounts of power for short periods.

SHORT-TERM POWER

Everyone agreed that the continuous power of an amplifier should be rated as it always had been—by the ability of the amplifier to provide a constant voltage into a resistive test load at a given distortion over a specified frequency range. And it was agreed that the flaw in the old music-power rating was in the recommended test technique, not in the concept itself. All that remained was to define "short term" in some meaningful way so that a dynamic-power test could be designed. The committee's task was thus to come up with a waveform to be used in our revised dynamic-power measurement, plus a new term to describe it that would avoid the stigma attached to "music power." After some analysis of recorded musical waveforms, we decided that the peak output level had to be maintained for at least 20 milliseconds to be truly useful (audible). The final test waveform decided on was a 1-kHz sine wave that increases in level by 20 dB for 20 milliseconds every half second. It sounds like a tone interrupted by loud beeps. To avoid a repeat of the "music power" wattage-rating shenanigans, we decided to express the increase above the continuous power by a ratio (converted to decibels) rather than in watts. This got around the FTC wattage-rating restrictions in addition to being foolproof: Advertising copywriters probably don't understand decibels well enough to pervert the usage of "dynamic headroom." We needed the question of a new descriptive term, and I think I was the one who came up with "Dynamic Headroom." (For an explanation of how power output is measured, see "Power Tests," p. 52.)

WHY MAX HEADROOM?

There are several ways of looking at the virtues of high dynamic headroom. The continuous output power of an amplifier is basically provided by a large, heavy, and relatively expensive power transformer. A conventional Class AB output amplifier designed to provide a continuous power of, say, 200 watts (23 dBW) per channel is therefore quite costly. However, if the continuous rating were to be 50 watts (17 dBW) but the dynamic headroom a high 6 dB, the amplifier would still have 200 watts available for musical peaks and yet would be smaller, cooler, lighter, and far less expensive. Now, a 50-watt amplifier won't cut the mustard when sustained power beyond its rating is called for, but for short-term peaks, any extra headroom can make a worthwhile audible difference. Any amplifier headroom is nice to have available when you are playing CDs, or (someday?) prerecorded DATs, whose ratio of peak-to-average signal level can be 10 to 20 dB higher than those on the equivalent LP. Somehow, the amplifier testing committee was lucky enough in 1975 to foresee, or idealistic enough to at least hope, that one day the dynamic range of program material would approach that of live music, and that by instituting a precisely defined dynamic-headroom rating, consumers could profitably compare amplifiers' abilities to reproduce such wide-range recordings.
Long Live the King

SO BUDDY RICH IS GONE. IT WOULD appear then that supermen are mere mortals after all. Not a bit of it!

I came upon Buddy in the late 1960s, when I was attempting to make a name for myself in London as a rock drummer. Carl Palmer insisted that he take me to a club to see Buddy and his new band. Most of the evening has gone with the mists of time. Two things, however, are etched in memory. The first is the wonderful precision of Buddy’s band and the breathtaking work of the various soloists. The second is the man himself. Being in my twenties at the time, I was completely unprepared to see someone almost 30 years my senior transform my instrument from the merely mundane to the stratospheric. His invention, combined with the sheer pleasure of playing, transfixed everyone watching in the small room.

Shortly after that evening, I attended a clinic that Buddy conducted. In the audience were some of the best names in English percussion, and once again, excitement was rampant. Buddy entered, sat at his kit, and regaled the room with ten minutes of his particular form of acid humor. That disposed of; he gave a brief recital, playing while seated forward, sideways, and finally backwards, all the time performing faultlessly. The most indelible memory of that day, though, is of the question-and-answer session that followed. Many respected drummers waded in with queries about technique and timing; to a man, they were treated to the sort of sarcastic rebuff that Buddy did so well. But when a small boy of not more than eleven stood up and asked, in a tremulous voice, what appeared to the assembled throng to be an extremely naive question about the hi-hat, Buddy came down from the stage with the item in question and proceeded to gently explain and demonstrate the answer. There wasn’t a man present who didn’t wish he was that young boy.

There are only two reactions open to the less fortunate of us when viewing a master at work: depression and inspiration. Buddy Rich was that rare individual who always forced the second reaction, because of his enthusiasm for what was so obviously his business. I shall miss him.

Andrew Steele

Mr. Steele played drums in Peter Frampton’s first band, the Herd, and has since been active as a session musician.

To Slava With Love

ALTHOUGH WE HAVEN’T MET before,” Gregory Peck said, “I understand that I am to call you Ted, and you are to call me Greg.” I looked up from my script and saw that he was smiling. “That will be fine with me, if it’s all right with you,” I said a little sheepishly. I’m not used to movie stars.

We were in the executive offices of the National Symphony Orchestra, preparing our lines for the next night’s gala concert in honor of Mstislav Rostropovich’s 60th birthday in the Concert Hall of the Kennedy Center. Peck had agreed to be the emcee, and was honing the script with producer Peter Wexler at his side. His marvelous sense of polish and euphonious voice were going to be our insurance—our guarantee that no matter what went wrong, we’d be a hit. Even nervous editors unaccustomed to bright lights and live audiences weren’t going to prevent this concert from going over the top.

Of course, I wouldn’t be writing about it if it hadn’t gone marvelously. Rostropovich (“Slava to his friends, which means Slava to everybody,” Peck observed at the start) watched it all from the President’s box. The First Lady sat at his side; next to her was Galina Vishnevskaya. The National Symphony played for its music director under the batons of guest conductors Leonard Bernstein, Yehudi Menuhin, Cristóbal Halffter, James Conlon, and Maxim Shostakovitch. In addition to Menuhin, the evening’s soloists included Anne-Sophie Mutter, Jean-Pierre Rampal, Isaac Stern, Eugene Istomin, Yo-Yo Ma, Frans Helmerson, and Bella Davidovich. Krzysztof Penderecki led the Choral Arts Society of Washington in the premiere of a new work, Song of the Cherubim, written in honor of Rostropovich. A new hybrid rose, named for Slava, was presented to him by Kathleen Turner, and at the end, the First Lady led the orchestra and the audience in “Happy Birthday to You.”

In the middle of it all, I strutted and fretted my hour upon the stage, managed to say “Greg” and not “Gregory,” and tried to deliver a couple of anecdotes about the man who is this year’s Musical America Musician of the Year. Later, there was a big party at the French Embassy, where we all congratulated Slava on his honorary knighthood from Queen Elizabeth (Sir Slava?). As I was writing this, the White House announced that Slava will receive the Medal of Freedom from President Reagan in June. We sure know how to pick a Musician of the Year.

Ted Libbey

Ted Libbey edited the story of Mr. Steele’s encounter with Buddy Rich. Libbey is the managing editor of Musical America. He is the author of numerous articles on classical and popular music, and has written for The New York Times, The American Scholar, and other periodicals.
Star conductors are on the move, leaving America's orchestras without the "personalities" they once had and diminishing their stature on record.

By Theodore W. Libbey, Jr.

Musical Chairs

Whoever invented musical chairs had the right idea. A handful of chairs arranged in a circle. Music from a jack-in-the-box, and a procession of kids in party clothes and comical hats marching around the chairs until the music stops! A mad dash, and—always—someone with nowhere to go. The thrill of victory among the survivors, and the agony of defeat writ large on the face of the unfortunate little one. Remove a chair, start the music over again, and continue, each time with one more child than there are chairs, until only the lucky one remains.

What makes sense about musical chairs is that for every winner there are six, eight, a dozen losers. It's a metaphor for life, and we learn it at an early age.

Today there's a new game of musical chairs being played on the podiums of the world's major orchestras. But in this game of musical chairs, there are no losers.

Instead of chairs neatly lined up, the game is played with music directorships scattered here and there. There are more of these positions than there are players in the game, so no one is ever eliminated. But since it is not a good idea to leave one or another of them vacant for too long, the rules allow for a player to occupy more than one chair simultaneously. This he does simply by moving back and forth, sometimes while the music is playing, sometimes when it has stopped. The distances are not great—it is rare that positions are
separated by more than a few thousand miles, and frequently they are much closer than that—so it only takes a few hours by jet to get from one to another.

Since there is a shortage of players, some of the best are offered large amounts of money to occupy specific positions, generally the most prestigious ones. These players occasionally spend a turn or two as "guests" in another's position before returning to their assigned ones; to make the game a bit more interesting, there is a pool of players without assigned positions who do the same thing. The rules allow the players with the assigned positions to stay where they are, but few of them choose to do so for more than 10 weeks a year. The object of the game is to make money and, of course, to keep the music going.

It all sounds so simple, even a child could do it. The realities, however, are more complicated than the musical-chair metaphor suggests. Instead of simple rules, the game is governed by a fascinating interaction of personalities, aesthetics, cultural politics, and, yes, money. There are parts for press agents, critics, record companies, and boards of directors. Nonetheless, the making of a music director is a game, in which the conductor is both a participant and a piece. The real players—often seated on opposite sides of "the board"—are his management and that of the orchestra.

It was not always this way. Thirty or forty years ago, music directors spent the entire season with their orchestras, and as often as not held what amounted to lifetime tenures. It was possible to say that such orchestras as those of Chicago, Boston, Philadelphia, and Cleveland were the orchestras of Frederick Stock, Serge Koussevitzky, Eugene Ormandy, and George Szell; and in Europe, there was the inexhaustible Willem Mengelberg, who manned the helm of the Concertgebouw Orchestra for half a century. One global development that, in the interim, has contributed to the gradual disappearance of such arrangements is the lengthening of symphony seasons. Most major orchestras now operate 52 weeks a year, with subscription seasons ranging from 24 to 28 weeks; tours, special programs, and summer seasons fill an additional 20 weeks or so, and paid vacations account for the rest. Such seasons, while guaranteeing a reasonably good standard of living for the players, place great demands on orchestras and music directors alike. No conductor, however energetic, can prepare that much repertory or spend that many weeks in front of the same orchestra without burning himself out, so the door has been opened to guests.

Perhaps even more significant is the fundamental change that has come over the role of the music director itself. It used to be that a music director took total responsibility for planning a season's repertory, engaging soloists, examining new scores, auditioning new players, and rehearsing and conducting the orchestra. Now, many major orchestras have specialists, called by a variety of titles (often something like "artistic administrator"), to help with the first three tasks. While still responsible for the overall direction of artistic policy, the music director spends more of his time with the orchestra, on the podium. One reason this has happened is that, as the principal conductor, he has become a commodity: Having a star on its podium is the most important advantage an orchestra can give itself today. Star conductors bring recording contracts with them. Star conductors sell tickets. Star conductors attract the interest of wealthy patrons. Star conductors are marketable products who, like athletes, command enormous salaries, but, also like athletes, usually make a huge difference at the box office. An orchestra like the Boston Symphony or the New York Philharmonic is, to be sure, an artistic entity, but it is also in the entertainment business, a medium-size nonprofit organization that functions like a large corporation, with hundreds on its payroll and millions in its budget. It is essential for such enterprises to have star performers on their podiums.

The emergence of the star music conductor is a symptom of the gradual replacement of interest in music by interest in performance. One may well lament that fact, but the players in the game recognize it and play accordingly. Musical chairs is a mechanism for producing star conductors. How well does the mechanism work? A recent, and very neat, example is provided by the selection of a new music director for the Staatssymphonie Dresden. The result? Three apparently happy orchestras: the Staatskapelle Dresden; the Gewandhaus Orchestra for half a century; the Minnesota Orchestra. Fit the music director of the Staatskapelle Dresden. fit the music director of the Cleveland Orchestra. Now, many major orchestras have specialists, called by a variety of titles (often something like "artistic administrator"), to help with the first three tasks. While still responsible for the overall direction of artistic policy, the music director spends more of his time with the orchestra, on the podium. One reason this has happened is that, as the principal conductor, he has become a commodity: Having a star on its podium is the most important advantage an orchestra can give itself today. Star conductors bring recording contracts with them. Star conductors sell tickets. Star conductors attract the interest of wealthy patrons. Star conductors are marketable products who, like athletes, command enormous salaries, but, also like athletes, usually make a huge difference at the box office. An orchestra like the Boston Symphony or the New York Philharmonic is, to be sure, an artistic entity, but it is also in the entertainment business, a medium-size nonprofit organization that functions like a large corporation, with hundreds on its payroll and millions in its budget. It is essential for such enterprises to have star performers on their podiums.

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burbach, on international tours in 1985–86. Word is already out that he and the Pittsburgh are going to be one of the country’s hottest combinations in the seasons to come. Meanwhile, Los Angeles is delighted to have Previn, who returns to his former stomping grounds, though this time not to work in Hollywood but at the Dorothy Chan-dler Pavilion. And Cleveland and Dohnányi go merrily along, recording warhorses for London and Telarc, but offering much more adventurous fare in concert.

If there is a drawback to this scheme, it’s that the great personal and artistic legacies left by the conductors of the older generation seem not to be forthcoming under the rules of the musical-chairs game. American orchestral traditions—once so pronounced in the days of Stokowski, Koussevitzky, and Toscanini—seem to be more easily erased and remade. Within weeks of Previn’s departure, according to Marshall Turkin, former managing director of the Pittsburgh Symphony, the orchestra’s players were referring to themselves as the orchestra of William Steinberg, not the orchestra of André Previn. If Previn’s effect on the orchestra was so slight, and his influence so fleeting, the world of music really needs. Otherwise, dynasties—like those of Gehrig and the Ford/Mantle years to establish a more permanent presence on their podiums of fully committed music directors—do American orchestras have anything left to offer the recor-d labels?

Just to stay in the recording game, it will be necessary for them to become more closely identified with their star music directors. The strategy has worked well in Mon-

can a great tradition be said to have been sustained?

Once again, a parallel can be drawn with the world of professional sports. The musical-chairs syndrome has a great deal in common with free agency in baseball: Stars go where the money is and tend not to stay rooted in one spot. This has had a leveling effect that is good for baseball, because it has enhanced competition and made it harder for dynasties like the Yankees of the Ruth/Gehrig and the Ford/Mantle years to establish themselves. But dynasties—like those of the Koussevitzky years in Boston and the Stokowski years in Philadelphia—are what the world of music really needs. Otherwise, orchestras begin to sound interchangeable.

Another complication is that some conductors are not easily made into stars. San Francisco faces that problem now with maestro Blomstedt, by all accounts a competent conductor, if not a charismatic one. An enor-

meous publicity campaign has been launched in San Francisco to build Blomstedt’s image, an interesting aspect of which is the omission of Blomstedt’s first name. The reason, it has been suggested, is that “Herbert” is viewed as too wimpy a name for a conductor. It makes one wonder how Herbert von Kara-
MILHAUD STRING QUARTETS: AQUITAINE PLAYERS

Darius Milhaud, surely one of the 20th century's most prolific composers, turned out 18 string quartets between 1912 and 1950. They're not his best efforts, and almost any one of them can be heard as representative of the lot. Notwithstanding Milhaud's penchant for experimenting with structure and his occasional forays into polytonality, ethnic rhythm, and quasi-expressionist melodic free flight, they invariably come across as mere bonbons; sophisticated as they are in terms of craftsmanship, none of them makes much of a statement, and even their very real charm wears thin after several of them are heard in succession.

The only available recordings of the Milhaud quartets are those on the French Cybelia label: In recent years, the Arcana Quartet brought out two albums of them (Nos. 2, 6, and 15 on CY 653 and Nos. 3, 4, 9, 12, 14, and 17 on the two-disc set CY 651/2), and now an ensemble made up of members of the Centre National de Musique de Chambre d'Aquitaine has issued Nos. 5, 8, 11, and 13. These latest performances are remarkable mostly for their energy; intonation is sometimes insecure, the sound is more often than not rough-edged, and the feeling of suavity that ought to permeate Milhaud's chamber music is generally lacking. Playing time: 63:56. (Cybelia CY 805, Distributed by Qualiton Imports, 39-28 Crescenti St., Long Island City, N.Y. 11101.)

CHRISTOPHER PARKENING: RECITALS AND REISSUES

I doubt that anyone better appreciates Christopher Parkening's genius than Andrés Segovia. The venerable maestro, whose life has been a monument to the guitar, has repeatedly singled out the brilliant young American as one of the most gifted guitarist of our time, "one touched by the finger of God."

Parkening, in turn, comes to us as a pilgrim from Segovia's mysterious, haunting world. He is one of the few who have ever truly mastered the guitar, and for him the love of Segovia's music was the beginning of wisdom. Segovia, after all, single-handedly brought the guitar out of obscurity and into the realm of serious music, compelling in the process a wealth of challenging transcriptions, notably from Bach. Parkening, to his credit, embraced that patrimony and has sought to preserve and enhance it for future generations. Angel has recently released on Compact Disc four remarkable collections that represent both aspects of his efforts.

In the Spanish Style contains an hour of Parkening's finest early recorded selections (playing time: 59:42; Angel EMI CDC 47194). Here, in what are some of the most challenging pieces in the repertory, he establishes the breathtaking standard of technical perfection and sensitivity that has become his trademark. No other guitarist has approached Segovia's example so closely.

Parkening's playing reflects not only a love of the great tradition that informed it but also the religious inspiration that occasioned the creation of so many classical masterpieces. In Simple Gifts (playing time: 38:10; Angel EMI CDC 47525), the guitarist soars from an exquisite Bach Prelude to the rhythmic Nigerian "Jesus, We Want to Meet." In the "Evening Prayer" from Humperdinck's Hänsel und Gretel, he effortlessly and quite faithfully captures the hushed voices and poignant orchestral accompaniment of the original. The duets offered here—all transcribed by Ronald Ravenscroft (with Timothy Howard on harpsichord and Parkening playing both voices in the "Laudate Dominum" from Mozart's L'espera Salutem de Confessores, K. 339)—will be welcomed by all who have sought a wider repertoire for the guitar. The best gift of all comes from Haydn, via Ravenscroft's fine transcription of the hymn tune from the master's String Quartet, Op. 76, No. 5, a majestic pearl that will grace the recitals of guitarists for generations to come.

A Bach Celebration (Angel EMI CDC 47195) is Parkening's first foray into recording with full orchestra. (Even though he has performed the Rodrigo concertos on tour for years, he has yet to record them.) The collection is reminiscent of Parkening Plays Bach [reviewed in "The CD Spread," September 1986]; and while it must be said that "Sheep May Safely Graze" and "Jesus, Joy of Man's Desiring" appear better suited to unaccompanied performance, "How Joyful Is My Heart," with Allan Vogel's oboe d'amore, stands out as a fine example of the art of arranging. The disc's playing time is only 37:17, but the collection should be popular among music lovers who might find listening to a solo guitar recital too taxing.

Kathleen Battle's work with Parkening in The Pleasures of Their Company is the jewel in the crown here, offering such extraordinary pleasures that one hopes further collaborations will follow. In the Renaissance pieces, Parkening handles his debut as an accompanist with a grace that both underscores Battle's measured, sure interpretations of John Dowland and limits the beauty of the original lute accompaniment, a most difficult achievement that seems to come naturally.

The later pieces cover a broad spectrum, from the whispered "Para Nitar" to the jubilant spirituals and the boisterous "Bai Bumba." Guitar and voice combine as one melodious and harmonious instrument in the inspired, sensitive hands of these performers. The Pleasures of Their Company (playing time: 43:56; Angel EMI CDC 47196) not only marks a promising debut for this duo of superstars but should become a classic among collections of song.

SCHEMELER, MUFFAT SONATAS: LONDON BAROQUE, MEDLAM

On disc: at least, the largely Italianate virtuoso instrumental works of the Austrian composer Johann Heinrich Schmelzer (c. 1625-1680) have been sadly neglected by the vanguard of early music's "authenticity" movement. The London Baroque's new digital recording of five of the three-part sonatas actually introduces Schmelzer's name to the current catalog. It's a welcome record-
...ing, and a splendid one, too. Under the direction of cellist Charles Medlam, the performances, like the material itself, are on the whole more notable for their surface brilliancy and dramatic effect than for their substance. Beneath the flashy veneer, however, the listener can observe countless fine details—in the sheer variety of articulations in the violin passages for example, or in the phrasing of the bass lines—that suggest the players' indulgence in razzle-dazzle, like Schmelzer's, is very much a matter of choice.

Only one of the Schmelzer pieces is from a published collection (the 1659 Duodener se-lectorum sonatarum); the others—which include a Lamento on the death of Ferdinand III and a sonata based on the folk song "Lantertyla"—are from manuscripts at the library at Olomütz (Olomouc), Czechoslovakia. They share the disc with two works by Georg Muffat, a lengthy Sonata a 5 from the 1682 Armonico Tributo collection and an unpublished accompanied violin sonata. In the latter, the refined, appealingly aggressive soloist is Ingrid Seifert. Playing time: 61:35. (Harmonia Mundi, U.S.A. 90.1220.) J.JW.

BERLIOZ "FANTASTIQUE": CONCERTGEBOUW, DAVIS

The transfer of Sir Colin Davis's Berlioz series to CD continues with his 1974 remake of the Symphonie fantastique. The digitally remastered analog sound is satisfactory, and the performance is wonderfully elegant, with the Concertgebouw Orchestra in excellent form throughout. Superb liner notes by David Cairns. Playing time: 55:39. (Philips 411 425-2.) T.T.

SCHUBERT, SCHUMANN Fantasies: PERAHIA

The Schumann C Major and the Schubert Wanderer fantasies, a familiar coupling, are superlatively performed here by Murray Perahia, one of our most consistently satisfying pianists. The only possible complaints are technical ones: Andrew Kazdin's digital sound is slightly cold and tubby, and the Schubert contains no internal bands. Playing time: 51:52. (CBS Masterworks MK 42124.) T.T.

HAYDN MASSES: AUGSBURG, KAMMLER

In 1746, eight-year-old Joseph Haydn became a chorister at St. Stephen's Cathedral in Vienna. Nine years later, when his voice changed, he was unceremoniously dismissed. One of Haydn's earliest surviving compositions, the Missa Brevis in F major (Hob. XXI:1), dates from that same year. The Mass in G major (Sancti Nicolai; Hob. XXII:6) of 1772 and the Missa Brevis in B flat major ("Little Organ Solo," Hob. XXII:7) of 1775 are also included on this recording. These early masses are essentially cheerful and optimistic, uncomplicated in their attitude toward God. Yet certain adventurous harmonic progressions and a poignant lyricism, particularly in the Sancti Nicolai, point to the composer's later maturity.

It is a special joy to hear these masses performed by a choir much like the one of Haydn's youth. The soloists and chorus of the Bov's Choir of Augsburg Cathedral produce a pure, light tone, not burdened with too much vibrato, and they display remarkable vocal control in both pitch and articulation. In fact, the choir is so vibrant and energetic that the overly polite Residency Chamber Orchestra of Munich, conducted here by Reinhard Kammler, pales in comparison. Perhaps the orchestra felt obliged to make a distinction between sacred and secular that Haydn himself did not. But the Augsburg boys make this first CD of Haydn's early masses a delightful discovery. Playing time: 54:12. (Angel EMI CDC 47529.) K.R.S.

BRUCKNER EIGHTH: NHK SYMPHONY, MATAČIĆ

The year before his death, Lovro von Matačić (1899-1985) made a live recording of Bruckner's Eighth Symphony with Japan's NHK Symphony Orchestra. Though he used the Nowak edition (which makes some cuts that I find a bit annoying), Matačić delivered a most impressive performance—alongside the Deutsche Grammophon version with Herbert von Karajan and the Berlin Philharmonic (which uses the longer Haas edition), one of the finest performances currently available on record. Matačić's overview of this immense score is uplifting and upbeat: The allegro movements for once aren't dragged, while the heavenly adagio unfolds as a rapt, beatific arc that makes the listener feel as if he were hearing the most beautiful music ever written. In addition, for an Oriental orchestra, the playing of the NHK Symphony is quite amazing. One expects precision and gorgeous tone from all those Suzuki-trained string players, but not such blazingly heroic work from the brass section, which in this instance rivals that of the Berlin Philharmonic itself. Moreover, this Denon CD manages to pack the entire 75-minute symphony on one disc—without the least bit of sonic compromise—which automatically makes this version a best buy. Highly recommended. Playing time: 74:13. (Denon C57-1001.) B.Z.

RACHMANINOFF SYMPHONIES: BERLIN, MAAZEL

These wonderful performances are in the spirit of the composer's own: Lithe, supple, and elegant, they let the emotion speak for itself. They do for the three symphonies what Edo De Waart and Zoltán Kocsis did for the piano concertos in their Philips recordings; instead of portraying Rachmaninoff as a gloomy, Byronic throwback, they allow him to speak to our contemporary sensibility. The tone is ironic, nostalgic, oddly grotesque, and thoroughly modern.

Since these performances by Lorin Maazel and the Berlin Philharmonic got short shrift in the wake of Vladimir Ashkenazy's then new but utterly conventionally viewed Nos. 2 and 3 (No. 1 is something special—his only podium performance deserving preservation), Deutsche Grammophon's convenient repackaging allows you to redress the balance. The orchestra plays superbly, the recording is much better than DG's digital average, and the fillers (The Rock and The Isle of the Dead) are equally distinguished. Playing time: 167:19. (Deutsche Grammophon 419 314-2.) D.H.
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SHOSTAKOVICH:
Quintet for Piano and Strings, in G minor, Op. 57; Quartets for Strings: No. 7, in F sharp

Richter*, Borodin Quartet. Igor Vepřinský and
Edward Shakhnazaryan, prod. Angel EMI
CDC 47507 (A).

SHOSTAKOVICH:
Quartets for Strings: No. 3, in F, Op. 73;
No. 8, in C minor, Op. 110.

Manhattan Quartet. Victor E. Schaefer, prod.
Centaur CRC 2020 (D).

SHOSTAKOVICH:
Concerto for Piano No. 2, in F, Op. 102*;
Symphony for Strings in A flat, Op. 118a
(arr. by Barshai from String Quartet No. 10).

D. Shostakovich*, M. Shostakovich*, Turovsky; I Musici de Montreal. Members of the
Montreal Symphony Orchestra. Brian Couzens,
prod. Chandos 8443 (D). © ABDR 1155. © ABRI
1155.

Shostakovich's finest music is quite possibly to be found in his chamber works.
Even at their best, his symphonies can be enigmatic; at their worst, they occasionally
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posed with passages of searing intensity and unrelenting power, are not to everyone's
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Shostakovich's Piano Quintet in G minor—one of the finest chamber works of the
20th century—is a beautifully balanced piece, a work of variety and rhythmic vitality
with a full complement of haunting themes. Unlike some of Shostakovich's late works,
it is not overloaded with largos, and it does not leave the listener with the impression of un-
relieved desolation. On a new Angel EMI Compact Disc, Svatoslav Richter and the
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from artists of this caliber, has just the right

THE BORODIN QUARTET: PLAYING WITH A PRECISION AND EXPRESSIVITY THAT ENABLE ONE TO GRASP THE SUBTLETY AND POWER OF THE MUSIC

touch. The live analog recording, made in 1983, sounds fine in spite of an occasional
tubiness in the piano, and the audience is undetectable until the concluding applause.

This generous disc, with a playing time of close to 70 minutes, also contains the Boroda-
in Quartet’s accounts of Shostakovich’s Seventh and Eighth Quartets. The Seventh
is a brief, gemlike work dedicated to the memory of Shostakovich’s first wife. The
poignant grief lyrically expressed in the first

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and the French National Radio Orchestra). Whatever the reason, it brims with delight. Vich Senior recorded it with Andre Cluytens for his son, Maxim, who premiered it in 1957. The piece quotes themes from several of Shostakovich's works and makes use of a musical motto derived from his initials: DSCH. Using the German spellings for the notes, the motto is D, E-flat (Es), C, B natural (H). - Ed. The work is weighted on both ends by genius, lovely largos that convey a feeling of deep sorrow. They frame a ferocious allegro molto, which alternates between stamping chords and wild gypsylike material, and an allegretto based on a weird little waltz. It is extraordinary music, in which Shostakovich takes on the aspect of a Russian Janáček.

The Borodin ensemble plays both quartets with a precision and an expressivity that enable one to grasp both the subtlety and power of the music. The analog recordings, from 1981 and 1978, are quite good, though a slight background hiss is detectable.

The Eighth Quartet may also be heard on a new Centaur disc featuring the Manhattan String Quartet (playing time: 48:23). It is paired with the Third Quartet, the second longest of the 15 Shostakovich wrote. Completed in 1946, shortly after the Ninth Symphony, it is every bit as powerful a composition as the Eighth Quartet. Its opening allegro has the same kind of wild, violent swagger and hammered chords as the allegro from the Eighth, while the ensuing adagio is beautifully poignant and haunting, surely one of Shostakovich's finest inspirations. The final movement closes with a quiet lament that must be one of the most touching farewells in chamber music.

The Manhattan Quartet has a rougher style of playing than the Borodin, one that makes up in excitement what is lost in subtlety and tonal refinement. These players dig in with energy and total commitment. The sound on the disc — very clear and a bit raspy — goes with the quartet's style; there is nothing mellow here, but it will keep you on the edge of your seat. If there is a drawback, it is that another of Shostakovich's quartets could have easily fit on this disc.

Shostakovich's chamber-scale Piano Concerto No. 2, in F, Op. 102, written between Symphonies Nos. 10 and 11, is puckish, exhilarating, whimsical, wistfully romantic, and humorous. Anyone who has been beaten nearly to death by one of the longer symphonies should listen to it for sheer refreshment. The sense of innocence and the absence of vulgarity may be due to Shostakovich's having written the concerto for his son, Maxim, who premiered it in 1957 at the age of 19. (Later that year, Shostakovich Senior recorded it with André Cluytens and the French National Radio Orchestra.) Whatever the reason, it brims with delight. Now, on a Chandos release (playing time: 44:34), the concerto's dedicatee, Maxim Shostakovich, conducts I Musici de Montreal in an account with his son, Dmitri, at the piano. The performances, not surprisingly, are quite similar. Maxim and the younger Dmitri, only marginally slower than Cluytens and the elder Dmitri, are completely in tune with the sprightly zest of the two allegros, as well as with the unabashed tenderness of the intervening andante. Grandfather would have been proud.

It is paired with the transcription for string ensemble of Shostakovich's String Quartet No. 10 in A flat, made by Rudolf Barshai with Shostakovich's blessing. One must first grant that this transcription makes the Tenth Quartet into something quite different; only then can its merits — the added weight and power it gives the music — be appreciated. While Barshai's transcription and Turovsky's performance do not sacrifice anything in intensity and do show new sides to this gem, something is still missing — specifically a sense of intimacy and of the intense communicativeness and expressivity that intimacy affords. The sound is quite good if a bit reverberant.

My only real complaint concerns playing time: There is less than 45 minutes of music on this transcription makes the Tenth Quartet into something quite different: only then can its merits — the added weight and power it gives the music — be appreciated. While Barshai's transcription and Turovsky's performance do not sacrifice anything in intensity and do show new sides to this gem, something is still missing — specifically a sense of intimacy and of the intense communicativeness and expressivity that intimacy affords. The sound is quite good if a bit reverberant. My only real complaint concerns playing time: There is less than 45 minutes of music on this disc. Robert B. Reilly

BACH:

Motets: B.W.V. 225–230, 118. Collegium Vocale Gand (Ghené); Choeur et
Ensemble Instrumental de la Chapelle Royale, Herreweghe. Michel Bernard, prod. Harmonia
Mundi HM 90.1231 (D). O HM 1231/2 (D).
Motets: Singet dem Herrn ein neues Lied, B.W.V. 225; Der Geist hilft unser Schwachheit auf, B.W.V. 226; Jesu, meine Freude, B.W.V. 227; Fürchtet dich nicht!, B.W.V. 228; Komm, Jesu, komm, B.W.V. 229; Lobet den Herrn alle Heiden, B.W.V. 230; O Jesu Christ, B.W.V. 118.

Motets: B.W.V. 225–230, 118; Cantates:
Christ lag in Todes Banden, B.W.V. 4; Nun ist das Heil und die Kraft, B.W.V. 50.
Monteverdi Choir, English Baroque Soloists, Gardiner. Michel Garcin, prod. Erato ECD
881172 (A, 2). O STU 71337. O

BACH:


BACH'S SIX INDISPUTABLY AUTHENTIC MOTETS (B.W.V. 225–230) are among his least-known vocal works. Written for various special functions — funerals, memorial services, even a birthday celebration — they bear a general resemblance to the early cantatas. Their German texts consist of chorale verses and Biblical extracts, and the settings, like those of the early cantatas, shun operatic aria and recitative and cling to dense, polyphonic chorale realizations. Although instrumental parts survive only for B.W.V. 226, an
in the pop music business describe—following a logic apparent only to themselves—as "acoustic." In this case, though, the sonic models are not the instruments that make up the standard Western orchestra but, rather, such exotic devices as Tibetan bells, African log drums, Indian tamburas, and Javanese gamelans; the several cuts not based (stylistically as well as sonically) on traditional non-Western music are also somewhat exotic, for their relatively simple tunes are flavored with "out of focus" harmonies based on various microtonal tuning systems.

Beauty in the Beast is more engaging than Digital Moonscapes, but only because the sounds themselves are sometimes fascinating. By and large, the music is pop—all of it simply (albeit smoothly) constructed and none of it as dynamic or ear-dazzling as the authentic Third World music Carlos tries to imitate. In her liner notes, Carlos opines that all machines—including digital synthesizers—are to a certain extent "beastly" and that all beasts—including the mechanical ones—are to a certain extent beautiful. This album, she says, reveals some of the beasts she's found in her particular electronic arena. The sounds are lovely; but that's about all there is to it.

People who buy this CD ought to check it out in the store before they take it home. On my copy, the two longest tracks—the "Poem for Bali" and the 144-note-per-octave "Just Beginnings"—were horribly marred by skips and blips. Playing time: 57:50.

James Wenzlick

**CARLOS:**

Beauty in the Beast.

CARLOS: Wendy Carlos, prod. Passport 03 SYNCO 200 (D). © (Distributed by JEM.)

This latest effort by WENDY CARLOS is more appealing than her Digital Moonscapes album on CBS a few seasons ago. Here, too, she uses an array of digital synthesizers to re-create the sounds of instruments that people in the pop music business describe—following a logic apparent only to themselves—as "acoustic." In this case, though, the sonic models are not the instruments that make up the standard Western orchestra but, rather, such exotic devices as Tibetan bells, African log drums, Indian tamburas, and Javanese gamelans; the several cuts not based (stylistically as well as sonically) on traditional non-Western music are also somewhat exotic, for their relatively simple tunes are flavored with "out of focus" harmonies based on various microtonal tuning systems.

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Orchestra and resident pianist with the Smithsonian Institution's Twentieth Century Consort— is an outstanding performer of modern music.

Even Orkis, however, has trouble breathing life into the hulking piano sonata Richard Wernick wrote for him in 1982. Granted, this 41-minute soliloquy is supposed to be a heavyweight piece; according to William Bland’s liner notes, its three movements depict “anger and despair” and “dark introspection,” “reminiscence,” and “static, immobile inarticulation,” and—in an ultimately quiet finale based on one of J. S. Bach’s most anguished chromatic motifs—a “reaffirmation of spiritual faith.” But the music is merely massive, not monumental. It plods and staggers, as though trying to support some lyrical burden that is nowhere to be heard. For all its lofty intentions—and in spite of the dedicated reading Orkis gives it—the Sonata for Piano is sadly uninspiring.

Wernick’s catalog includes many works that demonstrate his ability to use a stark, atonal vocabulary and rigorous constructive techniques as means to richly—sometimes profoundly—expressive ends. One thinks, for example, of his 1971 Kaddish-Requiem (Nonesuch 71303), his 1979 chamber cantata based on William Blake’s A Poison Tree (Spectrum SR-183), and his Pulitzer Prize-winning, as-yet-unrecorded Visions of Terror and Wonder for mezzo-soprano and orchestra. All of those pieces, however, involve texts, and their dynamic qualities derive largely from Wernick’s deft musical commentaries on meaningful words. The only poetry in the Sonata for Piano is to be found, alas, in the three movements’ aphoristic subtitles. And that’s not nearly enough to make the piece work.

On the other hand, George Crumb’s 1979 A Little Suite for Christmas has all the momentum it needs to carry a listener through its 15-minute duration. In the tradition of Messiaen’s l’ange regardant sur l’Enfant Jesus, it’s a series of pianistic meditations on aspects of the Nativity. The seven sections—all short and well paced—are generously colored with the sustained harmonics and pizzicato strums that have long been part of Crumb’s sound palette, but the results—even in this recording, which throws the sound effects into sharp relief—are not at all gimmicky. Like the Wernick sonata, this is very serious music, but it has the advantage of being effective serious music. Playing time: 56:17.

James Wierzbicki

Honegger:
Symphonies: No. 2, for Trumpet and Strings; No. 4 ("Deliciae basilissina").

Bavarian Radio Symphony, Dutoit, cond. Michael Kemppi, prod. Erato MCE 75259 (D). © ECD 88178

With these two relatively unfamiliar works, Charles Dutoit and the Bavarian Radio Symphony Orchestra complete the first digitally recorded cycle of the symphonies of Arthur Honegger. (The first installment in the series was the 1984 release of Symphonies No. 3 and 5; Symphony No. 1, in the company of several symphonic poems, appeared just last year.) Honegger’s Second Symphony (1941), for string orchestra, has been recorded several times, but probably never as winningly as here. The less frequently heard Fourth has been recorded before only by Ernest Ansermet, for London in 1960. Its title is apt indeed, for it is deliciously alluring music. With its mercurial changes of mood, it may come as a revelation to those who have heretofore known Honegger only by his brash, mechanistic Pacific 231.

Like the earlier releases in this Erato Editions Costallat series, this one is lovingly, idiomatically played and gleamingly, warmly recorded.

R. D. Darrell

Prokofiev:

Concertgebouw Orchestra, Ashkenazy, Andrew Cornall, prod. London 417 314-2 (D). © 03

At a recent concert in Carnegie Hall, Vladimir Ashkenazy led the Royal Philharmonic Orchestra in what several New York critics decried as dismal performances of Strauss’s Don Quixote and Rachmaninoff’s Symphony No. 2. The consensus was that Ashkenazy lacked the musicianship and podium skills needed to achieve decent results. Since the Concertgebouw can play rings around the Royal Philharmonic, Ashkenazy’s new account of Prokofiev’s Fifth Symphony sounds technically polished. But then, so did his recording of the Rachmaninoff Second, which was made with the Amsterdam orchestra, and his Don Quixote, for which Ashkenazy had the superlative Cleveland Orchestra playing around him.

Still, this is a much poorer performance than one might think upon first hearing. Its shortcomings manifest themselves in Ashkenazy’s total lack of interpretive viewpoint, his inability to project the music’s architecture, and his gross inattention to dynamic shadings, especially in the range above mezzo forte.

Listen, for example, to the great first-movement climax with its thundering drums and crashing tam-tam. A good conductor, like Neeme Järvi on his Chandos recording of the same work, knits this passage together: The cymbals answer the tam-tam, while the drums propel the groaning, heaving brass upward. A slight accelerando screws the tension tighter still until the movement’s final collapse. What does Ashkenazy give us? Brittle cymbals, a tam-tam that sounds like a trash-can lid struck with a wooden spoon, clotted gobs of brass, and a deep bass throb (like an organ pedal) that makes hash out of the entire low end of the sonic spectrum. This isn’t music, it’s noise.

Until someone has the guts to tell Ashkenazy to stick to the piano, all we can do is vote with our wallets. Go with Järvi on Chandos. Vanity records such as this waste a fine orchestra, a record company’s limited resources, and that most precious quantity of all, your time. Playing time: 51:39.

David Hurwitz

Schubert:
Sonata for Piano, in G, D. 840 ("Unfinished").

Richter, Phillips 416 292-2 (A). © 03

Sviatoslav Richter fascinates by the extremes to which he goes, whether in his demoniacally fast performance of Beethoven’s Appassionata Sonata or in this intensely concentrated, slow-motion account of Schubert’s unfinished Sonata in C, D. 840. In either case, Richter’s is not a trick performance but the result of rethinking by a profound musician.

Richter’s vertical dissection of the Schubert sonata comes close to stasis at times and seems quite stark and austere. Each note is made to stand on its own; not one is allowed to pass by as part of the singing line that a Wilhelm Kempff, for example, plays so lyrically. The result is unquestionably mesmerizing.

However, played in this fashion, the music seems naked, if not skeletal. While Kempff draws out the piece’s full human drama with flexible temps and a rich palette of tonal shadings, Richter sounds almost monochromatic and metrically square. His interpretation is fascinating for how much of Schubert’s beauty it can sustain, at times even enhance—it’s a bit like seeing Hamlet in black and white. But there’s nothing quite like Shakespeare or Schubert in full dress, and for that reason, I would recommend this performance primarily for the connoisseur.

Richter plays only what Schubert wrote, eschewing various completions of the last two movements. The music simply stops. Until someone has the guts to tell Ashkenazy to stick to the piano, all we can do is vote with our wallets. Go with Järvi on Chandos. Vanity records such as this waste a fine orchestra, a record company’s limited resources, and that most precious quantity of all, your time. Playing time: 51:39.

Robert R. Reilly
WHEN SHOSTAKOVICH'S FIFTH SYMPHONY burst upon the world in 1937, it was hailed as the quintessential musical product of Socialism Realism, the doctrine, directly associated with Stalin, that art should be popular and optimistic. Clever Western critics admired it, but some, led by Russian musicologist Saul Kertsner, were skeptical, questioning whether the Fifth Symphony was nothing more than the forced smile of Stalinism

In 1959, Leonard Bernstein and the New York Philharmonic recorded a frenetic, hyperactive performance of the work as a "flawed masterpiece" marred by bombast. Their condescending view of the work as a "flawed masterpiece" cast a shadow over its growing popularity.

Now Soviet émigré conductor Semyon Bychkov makes his recording debut with still another perspective on this infinitely rich music. In the finale, he adopts Rostropovich's approach, but to much less powerful effect. That may be partly because the Berlin Philharmonic is too light-textured an ensemble for this often brutal music. Or it may be that Bychkov has gauged his interpretation to fit the orchestra's type of sound. The first movement gets a much quicker reading than usual, very fluid, but with some lumpy gestures in the opening pages. The Scherzo lumber by quite slowly. This throws the weight of the argument onto the slow movement: absolutely exquisite, with gossamer string textures. In this context, the finale makes its point without exaggeration. It's an interesting, legitimate approach, but one that cannot be recommended over those of Rostropovich or Rozhdestvensky, simply because they find more in the work as a whole. Playing time: 48:07.

David Hurwitz

STRAVINSKY: The Rite of Spring

Le Sacre du printemps/
Four Norwegian Moods.


The Rite of Spring is scored for a huge orchestra that includes augmented wind, brass, and percussion sections. This London recording spotlights the latter, particularly the bass drum, which is recorded with incredible clarity and impact. The sonic approach is spectacular in its way, but it yields little in the way of warmth or concert hall realism.

After hearing Riccardo Chailly and the Cleveland Orchestra in a broadcast performance of The Rite some months ago, I expected much from this recording. Unfortunately, it does not have the excitement of the broadcast. Chailly gives a brisk, rather prosaic reading that is short on imagination, although the Clevelanders play beautifully. The inclusion of Four Norwegian Moods scarcely suffices to make the Compact Disc a good value in playing time; surely from the myriad short orchestral pieces of Stravinsky, London could have found something additional.

It is also unfortunate that London does not provide separate cueing bands for the different sections of Rite. There are only two bands for the entire work; if you want to find a particular section, you'll have to do considerable fast-forwarding. Audio buffs will doubtless want to have this recording for its vivid percussion, but for me, the Rite to have is Colin Davis's Concertgebouw version on Philips, generously coupled with Petrouchka. Playing time: 41:33.

Robert E. Benson

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### TECHNICS SPESIALS

- **Technics SA-130**: AM/FM Stereo Receiver + 35 watts per channel + 0.009% THD + 1-kilohertz bass + 15kHz treble + digital display + Black finish
  - **Price**: $99.95

- **Technics SA-290**: Digital Stereo Receiver + 50 watts per channel + LED power meter + 15-response + 3-bands + 15kHz digital display + Black finish
  - **Price**: $159.95

- **Technics SL-P210**: Remote Control CD Player
  - **Price**: $199.95

- **Technics SL-P230**: Remote Control CD Player
  - **Price**: $199.95

- **Technics SL-D81K**: Self Drive Turntable
  - **Price**: $79.95

- **Technics SL-S55**: Three Way Reflex Loudspeakers
  - **Price**: $129.95

- **Technics SL-D55**: Three Way Reflex Loudspeakers
  - **Price**: $129.95

- **Technics SL-D33**: Three Way Reflex Loudspeakers
  - **Price**: $109.95

### NOTES

- **AKG K-1300**: Dynamic stereo headphones
- **AKG K-340**: Dynamic stereo headphones
- **TEAC EGA-10**: GA, which stands for Graphic Equalizer/Analyzer
- **Sony UX-PRO 10-Pack**: Features a High-resolution digital display, Black finish
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Nigel Kennedy's inquiring spirit has led him to reexamine the Tchaikovsky Violin Concerto, and the results are provocative, if not altogether satisfying. Kennedy's flexible tempos and rhapsodic manner occasionally become disruptive; fast passagework is rushed past the point of technical security, while slow musical lines are needlessly stretched. This same impetuosity leads Kennedy into some surprisingly rough articulations and instances of strident tone. However, such lapses are compensated for by moments of breathtaking poetry, particularly in lyrical passages, and there is no masking the unhindered Romantic streak that runs through his playing. On the whole, though, Kennedy's performance here lacks the perfect balance between passion, personality, and control that characterized his recent recording of the Elgar Concerto (EMI 7 47210 2). None of the shortcomings of his interpretation are evident in Kennedy's brilliant recording of Bartok's Sonata for Solo Violin (1944) and Duke Ellington's Mainly Black (1943), selected from the jazz-orchestra suite Black, Brown and Beige. Not only is Kennedy's pairing of these works a stroke of genius, but the stylistic versatility he displays in them is, to the best of my knowledge, unparalleled among present-day violinists. His performance of the Fantasia on a Theme by Thomas Tallis is convincing. Though his pairing of these works a stroke of genius, his execution is assured and imbued with an almost demonic intensity. (Here, Kennedy's rhapsodic tempo fluctuations and violent articulations are ideally suited to the music.) Mainly Black is offered in a deft, austere violin and double-bass arrangement by Kennedy himself, a version that makes Ellington sound more startlingly original than ever. This is no chic, watered-down foray into jazz, cleverly designed for crossover appeal. Kennedy, who has spent long years working with the legendary jazz violinist Stephane Grappelli, has mastered the radically different jazz violin technique, with its restrained vibrato, gritty bow stroke, lean tone, biting portamentos, and rhythmic freedom. The result must be heard to be believed. Playing time for Tchaikovsky/Chausson: 55:24. Playing time for Bartok/Ellington: 69:01.

K. Robert Schwarz

VAUGHAN WILLIAMS:
A London Symphony; The Lark Ascending.©


André Previn, who recently announced that he is stepping down as music director of the Royal Philharmonic to become that orchestra's principal guest conductor, has been rerecording his bread-and-butter repertoire with the RPO for Telarc. The results have ranged from very good (the Tchaikovsky Fifth) to rather limp (the Rachmaninoff Second). Previn is usually at his best in British music, and his new recording of Ralph Vaughan Williams's most lovely symphony (playing time: 48:43) represents a fine effort all around. Compared with Previn's 1972 recording of A London Symphony with the London Symphony, tempos throughout the piece are a fraction slower. This works well in the dramatic first movement, while the second is so gorgeous that technical considerations seem irrelevant. The scherzo lacks the last ounce of agitation (Adrian Boult's 1971 account is wonderful in this respect), and although the finale begins very well, the great climax, with its apocalyptic gong stroke, doesn't have the shattering impact of the Boult or the early Previn performance. It's not just a question of volume—there's plenty of that. Rather, Previn's episodic treatment prevents the music from accumulating the necessary momentum. Telarc's "mike in the bass drum" recording technique works well with this symphony. The dynamic range is awesome, though some high-frequency information sounds muffled. The glockenspiel in the first movement prevents the music from accumulating the necessary momentum. The dynamic range is awesome, though some high-frequency information sounds muffled. The glockenspiel in the first movement prevents the music from accumulating the necessary momentum. Telarc's "mike in the bass drum" recording technique works well with this symphony. The dynamic range is awesome, though some high-frequency information sounds muffled. The glockenspiel in the first movement prevents the music from accumulating the necessary momentum. Telarc's "mike in the bass drum" recording technique works well with this symphony. The dynamic range is awesome, though some high-frequency information sounds muffled. The glockenspiel in the first movement prevents the music from accumulating the necessary momentum. Telarc's "mike in the bass drum" recording technique works well with this symphony. The dynamic range is awesome, though some high-frequency information sounds muffled. The glockenspiel in the first movement prevents the music from accumulating the necessary momentum. Telarc's "mike in the bass drum" recording technique works well with this symphony. The dynamic range is awesome, though some high-frequency information sounds muffled. The glockenspiel in the first movement prevents the music from accumulating the necessary momentum. Telarc's "mike in the bass drum" recording technique works well with this symphony. The dynamic range is awesome, though some high-frequency information sounds muffled. The glockenspiel in the first movement prevents the music from accumulating the necessary momentum. Telarc's "mike in the bass drum" recording technique works well with this symphony. The dynamic range is awesome, though some high-frequency information sounds muffled. The glockenspiel in the first movement prevents the music from accumulating the necessary momentum. Telarc's "mike in the bass drum" recording technique works well with this symphony. The dynamic range is awesome, though some high-frequency information sounds muffled. The glockenspiel in the first movement prevents the music from accumulating the necessary momentum.
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David Hurwitz

Recreations and Miscellaneous

EDITA GRUBEROVA

Famous Opera Arias (S). 1

GRUBEROVA: Munich Radio Symphony Orches- tra, Gardelli, Axel Mehrle, Dieter Sinn, and Dieter Worneck, prod., Orfeo C 101 841 (D). o


Peter Serkin

Peter Serkin, Elizabeth Ostrow, prod. New World NW 344-2 (D). o

LIEBERSON: Bagatelles. STRAVINSKY, Serenade for Piano, in A; Sonata; WOLPE; Form IV; Broken Sequences; Pastorela; Four Studies on Basic Rows: Possocaglio. Peter serkin traverses no less than 60 years of 20th-century piano music on this rewarding disc, from the neoclassicism of Stravinsky through the expressionism of Stefan Wolpe to the alternately tranquil and scamping dissonance of Peter Lieberson. Stravinsky’s Sonata (1924) and Serenade in A (1925) are brittle, lean-textured works, infused with a Bachian contrapuntal rigor. Lieberson’s music has received sympathetic readings from Serkin in the past, most notably in the expansive Piano Concerto of 1983 (New World NW 325). The three miniature Bagatelles (1985) consist of a boldly arpeg- giated Proclamation, the radiantly calm Spontaneous Songs, which seem to suspend the passage of time, and a lively, jazz-inflected Dance.

A special word must be devoted to the neglected Stefan Wolpe (1902-1972). Born in Berlin, Wolpe studied with Busoni and Webern before leaving Europe for Palestine and later the United States. The three works selected here frame his long career: the Pas- sacaglia of 1936, Pastorale of 1939, and Form IV: Broken Sequences of 1969. The Passacaglia is unquestionably a masterpiece, speaking a dissonant, atonal language of violent intensi- ty and propulsive rhythmic power. Built upon one unyielding, prolonged crescendo, its harrowing vision eloquently mirrors the horror of its era. Form IV employs a more jagged, pointillistic idiom, but it loses none of the earlier work’s darting, explosive energy.

Too often, Wolpe—and especially Stra- lvinsky—are played as if percussive power should suffice. Though Serkin never denies this music’s chiseled textures and ham- mered intensity, he chooses to stress its more poetic, reflective aspects. Stravinsky’s Sonata (1924) and Serenade in A are the absolute limits of a contemporaneous Stimphalomenon named Maria Ivogin (whose subsequent Berlin pvals, incidentally, included a 1956 Fulbright Fellow named Evelyn Lear). Of all the Zer- binettas I have heard, I would have to award my personal palm to Edita Gruberova, the Slovakian soprano who burst onto the international scene at the 1974 Salzburg Festival and has reigned at the Vienna State Opera ever since.

I had never before encountered the opening Mozart aria, conceivably because Mozart’s murderous furniture place it beyond the capabilities of all but a very few sopra- nos. Gruberova tosses it off as the unique Miliza Korjus might have—only with the additional paramours of timbre, timbre, and diction that she shares with almost no other coloratura in that high register. The Bellini concentrates not on pyrotechnics but on bel- canto—as does the Cherubini, aside from a little cacciono with flute obbligato. The Mi- grumia aria offers some extraordinary filigree, but Gruberova, like every soprano of recent decades, ought to listen to Nellie Melba’s uncanny, true trill on her old acoustic recordings—and not rest until she is able to emulate it.

If this record (playing time: 45:59) affects you as it has me, you won’t want to miss the earlier Gruberova release, The Art of Coloratura (Orfeo C 072 831 A). Paul Maur

Profiessionally speaking, coloratura capable of singing the sopranorial role of Zerbinetta in Strauss auf Naxos see to have the life expectancy of mayflies. Over the decades, I have seen them come and go, a few of them blazing like comets, briefly, before burning out—at least for that role. Strauss indulged himself to the fullest, pushing the demands of Zerbinetta’s cruelly long (14:46) recitative and aria to the absolute limits of a contemporaneous Stimphalomenon named Maria Ivogin (whose subsequent Berlin pup- ils, incidentally, included a 1956 Fulbright Fellow named Evelyn Lear). Of all the Zer- binettas I have heard, I would have to award my personal palm to Edita Gruberova, the Slovakian soprano who burst onto the international scene at the 1974 Salzburg Festival and has reigned at the Vienna State Opera ever since.

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Too often, Wolpe—and especially Stra- lvinsky—are played as if percussive power should suffice. Though Serkin never denies this music’s chiseled textures and ham- mered intensity, he chooses to stress its more poetic, reflective aspects. Stravinsky and Wolpe emerge from their reservoirs of energy intact, but with a new warmth and delicacy that results in a surprising emotional breadth. No one takes literally any longer Stravinsky’s polemical denial of music’s ex- pressive potential, and it is high time that others follow Serkin’s intelligent, insightful path. Playing time: 53:48. K. Robert Schwarz
'Round midnight and you've no videos to watch? Rhapsody Films has plenty.

SEEN ANY GOOD MOVIE LATELY? I CAN recommend a few you may never heard of, with memorable characters and scores: Jackie McLean on Mars, Sun Ra: A Joyful Noise, Lift the Bandstand (with soprano saxophonist Steve Lacy), and The Last of the Blue Devils (with Count Basie, Big Joe Turner, and Jay McShann). These unsung jazz documentaries—along with about two dozen others devoted to the likes of Toshiko Akiyoshi, Jaki Byard, Bill Evans, and Elvin Jones—are available on Beta and VHS videocassette from Rhapsody Films (P.O. Box 179, New York, N.Y. 10014), the first U.S. video company devoted exclusively to jazz and blues.

"The problem facing anyone who makes a film about jazz is that his fate is in the hands of about 25 decision-makers across the country who think the subject is too esoteric," explains Bruce Ricker, the forty-four-year-old native New Yorker who runs Rhapsody out of the living room of his Greenwich Village apartment. "The people who program TV, for example, figure that because only maybe five percent of the public is interested in jazz, there's no sense putting these films on the air. Even PBS and cable think along those lines because the people in charge there all want to be executives at commercial networks someday and they've adopted the network sensibility. But the home video explosion permits the independent filmmakers in my catalog to bypass those decision-makers. And it allows the 2,000 or so people who buy every jazz album that comes out to program jazz on their TV sets, too."

Ricker's sensitivity to the plight of jazz filmmakers comes from being one himself. The top-selling item in Rhapsody's catalog is The Last of the Blue Devils, his 1979 feature-length ode to the fraternal spirit prevailing among Kansas City swing musicians even in old age. "After the bars closed at 1 a.m., they would gather at the Foundation, a private club that used to be the black Local before the Musician's Union integrated in the late '60s," Ricker says. "These were a bunch of old men, some of them not very well known, who had never given up, who still looked forward to playing together and swapping stories after all those years. After hanging out with them on the weekends for about six months, it occurred to me that there was a good novel there—or even better, a good film."

Originally budgeted at $12,000, The Last of the Blue Devils wound up costing $225,000 and taking...
four years to complete. "I'd never made a film before, and I sometimes got so excited about what was happening in front of my eyes that I forgot to load the camera," Ricker laughs. His costs escalated as his sense of Rhapsody pays 'as little as $20 to $80 per minute for you're willing to let them have it for practically nothing.' PBS, for instance, generally pays as little as $20 to $80 per minute for such material. "You're better off not allowing it on TV, because people will tape it, and that's X number of cassettes you won't sell. As for theatrical distribution, 'Round Midnight isn't going to open any doors for nonfiction jazz films. A lot of filmmakers don't even bother to strike theatrical prints anymore; why go to the expense when you'll have maybe ten bookings total, including festivals. They shoot on film but go right to videocassette."

RICKER ENTERED DISTRIBUTION ALMOST BY CHANCE. As part of the 1981 Kool Jazz Festival, he produced a jazz film series at the Carnegie Hall Cinema. A year later, when he ran a similar series at the Bleecker Street Cinema in connection with the Greenwich Village Jazz Festival, "a lot of the individual filmmakers who didn't have distributors told me to hang on to the prints and send them half the money if I got some bookings. Gradually, I put the films on videocassette, and Rhapsody drifted along for two or three years, selling a tape to a school or a library now and then—until all of a sudden, more than 50 percent of American homes had VCRs and there was a small demand for jazz films. 'Schools and libraries still account for roughly a third of the company's sales, with video stores (and record chains with video departments) accounting for another third and mail-order customers here and abroad the final third."

Rhapsody's titles tend to be about insiders' favorites rather than household names.

The best films are as worshipful and distanced as Whitney Balliett's prose.

The archival footage and still photographs of Lacy's mentors Sidney Bechet, Thelonious Monk, Gil Evans, and Cecil Taylor are judiciously interspersed with Lacy's articulate observations, and the film is a model of its kind. Robert Mugge's Sun Ra: A Joyful Noise, in addition to capturing the visual spectacle of Ra's live performances (something only hinted at in his many concert LPs), succeeds in bringing Ra's enigmatic personality into clearer focus than almost anyone has ever been able to do in print.

There are other treasures in Ricker's catalog, including his own The Last of the Blue Devils, which has become even more valuable as oral testimony with the passing of so many of the men it lyrically celebrates. Bill Evans on the Creative Process is a comically stiff but riveting black-and-white educational short featuring the pianist answering the questions of his officious-sounding older brother. A compilation called Jazz: Shorts is notable for "Daybreak Express," D. A. Pennebaker's breakneck subway ride to the music of Duke Ellington, and "Honky Tonk Budd." Scott Laster's tour-de-force dramatization of a piece by Chicago saxophonist and composer Edward Wilkerson. Chuck France's Jazz: In Exile, featuring candid interviews with Lacy, Dexter Gordon, Phil Woods, Johnny Griffin, and others, provides a strong antidote to 'Round Midnight's over-romanticized view of the expatriate blues.

On the other hand, Talmage Farlow, the Toshiko Akiyoshi study Jazz Is My Native Language, and the films about Harris and Byard plod along without much narrative finesse. Even so, these films represent the only way the future generations will have of knowing what these important musicians were like as people—and what expressions crossed their faces as they played their instruments, what tones their voices took as they discussed their frustrations and accomplishments. All of Rhapsody's films—the good, the bad, the indifferent—are worth watching because their subjects are.
IN SHORT ORDER

POP AND JAZZ MINI-REVIEWS

JOSH WHITE, JR., WITH ROBIN BATEAU:
(42:27) CD.
EVERYONE QUOTES "SMOKE ON THE WATER"
BEEP PURPLE:
HUNTERS AND COLLECTORS:
DAVID SANBORN:
(42:27) CD.
MTUME:
THE SONNY CLARK MEMORIAL QUARTET:
DAVID SANBORN:
HUNTERS AND COLLECTORS:
THE SONNY CLARK MEMORIAL QUARTET:
JULY 1987 73
ROYAL FAMILY SNAPSHOTS

VARIOUS ARTISTS:
Trumpet Kings.
Burrill Crohn, dir. and prod. Video Artists International 29036 (Beta), 69036 (VHS).

Narrated by Wynton Marsalis, this video purported to show us the history of the jazz trumpet, from Buddy Bolden to Lester Bowie. It leans on the marvelous movie collection of David Chertok but can't escape the scarcity of good clips from the early years of jazz. The relative weakness of the footage on more recent figures is less excusable: We are given a dullish segment of Freddie Hubbard on fluegelhorn and an uncharacteristic bop solo by Bowie, barely supported by the Art Ensemble of Chicago.

Burrill Crohn's writing is not always graceful, or even accurate. Marsalis is forced to introduce the music as "this uniquely American, democratic art form we call jazz" and later states that Dizzy Gillespie was the only trumpeter to find "another way of playing rhythms different from Louis Armstrong." I doubt it. At one point, Marsalis demonstrates—and these demonstrations are very useful—Armstrong's smearing half-valve technique. But after announcing that he will go down an octave, he descends merely a fifth. Marsalis introduces a marvelous 1957 solo by Rex Stewart as a blues chorus, but Stewart is playing a popular song, "The Blues My Naughty Sweety Gives to Me."

Yet much of Trumpet Kings is delightful watching. We see a portly Duke Ellington leading his 1930 band with solos by Freddie Jenkins and Tricky Sam Nanton; we watch Armstrong dance and sing his way through most of a 1953 "Dinah." Henry "Red" Allen takes a flutter-tonguing solo on "St. James Infirmary," and Bunny Berigan follows a dreadful vocal on "Until Today" with a stirring, Armstrong-inspired solo. Other clips, such as Red Nichols's scatting vocal, have only nostalgic value. Musically, the best segments are by Gillespie before his big band in 1947 and with a small group in 1959, a brilliant duet between swing trumpeters Charlie Shavers and Buck Clayton, and Miles Davis playing "So What" in 1959. The climax is a heartwarming duet between Gillespie and Armstrong, in which their two styles, the most potent in jazz, mesh gracefully. Marsalis's playing, which concludes Trumpet Kings, seems negligible after that.

Michael Ullman

JOHN COLTRANE:
The Coltrane Legacy.
Burrill Crohn, dir. and prod. Video Artists International 29035 (Beta), 69035 (VHS).

The huge personality of John Coltrane projects onto the two-dimensional TV
can't possibly do justice to the lushness of
appeared on the walls of Plato's cave: as a
screen in much the same way Reality ap-
and do not readily serve as museum pieces.
ly meant to go on for half an hour or more
more confident. Meanwhile, after years with
their best, these men lived at the heart of the
search for the unexplainable.
but why belabor the point? None of this
The vast reach of drummer Jones, the
intense lyricism of pianist McCoy Tyner, the
tense lyricism of pianist McCoy Tyner, the
gives us a solid taste of those crucial years
and the single "With or Without You"—the
result is as riveting as any of U2's more stri-
dent stadium rockers. The cresting-wave
the serene majesty of Trane himself ... at
their best, these men lived at the heart of the
glancing off your hand and creating a
at a time when people arc appar-
and it was anathema to the various fusion
the very redundancy of that theme -solo -theme
one hand, they codified for all time the
those later years would certainly be helpful.
and the single "One Tree Hill" (a eulogy for a dead friend),
and the song "With or Without You"—the
result is as riveting as any of U2's more stri-
dent stadium rockers. The cresting-wave
as elsewhere, Bono's exhortative
the haunting sound of The Joshua Tree
of executed murderer Gary Gilmore, and
the morning after, the
that end the LP—"Exit," based on the story
kill the album's momentum. Yet, true to the
too atmospheric for its own good, and that's
urban jazz, the haunting sound of The Joshua Tree
Detroit stadium rockers. The cresting -wave
that the hub: enfant terrible Marvin
Coltrane's quartet truly had no equal.
The vast reach of drummer Jones, the
the serene majesty of Trane himself ... at
their best, these men lived at the heart of the
gap at the core of the review is current, and each solo is relevant and
to the portrait. Inclusion of Eric Dolphy on some
tracks gives a hint of the greater freedom
Coltrane would later pursue with Pharoah
Another good video dealing with
those later years would certainly be helpful.

THE ART FARMER/BENNY GOLSON JAZZTET:
Back to the City.

Helen Keane, prod. Contemporary C 14020.
The jazztet of the early '60s represented
either the best or the worst jazz of the peri-
donning your point of view. On
one hand, they codified for all time the
three-horn front line, listenable melodies,
and straightahead improvisation that
spelled out hard bop; on the other hand, the
very redundancy of that theme-solo-theme
format characterized an already dying style,
and it was anathema to the various fusion
heads and freedom heads that were appear-
ing Hydra-like all over the musical scene. As
it was, the group disbanded after only three
years, with flugelhornist Art Farmer eventual-
ly settling in Vienna and tenor saxo-
phost Beny Golson retiring to the studios of
Hollywood. But fate, along with a few
good promoters, has brought them together
again, and at a time when people are appar-
rently ready to hear uncomplicated, down-
home jazz.
The group has benefited from the layoff.
Golson hasn't lost the offbeat, personal ap-
proach that once made his voice so recogniz-
able, and Farmer's warm lyricism has grown
more confident. Meanwhile, after years with

Art Blakey, trombonist Curtis Fuller is now a
star in his own right. But it's the rhythm sec-
tion that's the hub: enfant terrible Marvin
"Smitty" Smith, no longer a child but per-
haps today's most exciting drummer; Ray
Drummond, whose five-minute bass solo on
"Speak Low" is the high point of this LP, and
pianist Mickey Tucker, who holds it all to-
gether. There are no weak links in this chain,
nor is there any grandstanding: The reper-
toire is current, and each solo is relevant and
to the point. It's a deeply satisfying record.

for Blum

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NICK DRAKE:

FRUIT TREE.

Joe Boyd, prod. Hannibal HNBX 5302. (Distributed by Carthage, Box 667, Rocky Hill, N.J. 08553.)

TAKEN TO DRESSING in BLACK and SCARED of performing in public, British singer-songwriter Nick Drake was the sort of person who made Leonard Cohen sound like the life of the party. The three albums he released during his lifetime were the recorded equivalents of mood swings, starting with the delicate and beautiful Five Leaves Left (1969), progressing through the lusher, more upbeat Bryter Layter (1971), and ending with the relentlessly bleak Pink Moon (1972). When Drake was found dead in his bedroom in 1974, an apparent suicide, it seemed almost inevitable.

While that may paint a depressing picture, Drake's baroque meld of folk/jazz is actually uplifting: It resonates with the same hopeful pessimism that charged the State side work of contemporaries Tim Hardin and Tim Buckley (with whom Drake shared a soft, vulnerable voice). Fruit Tree, a boxed set that collects all three albums plus a respectable bonus LP of miscellaneous outtakes and demos, makes a great case for his overlooked talent. It also reveals that, in context, the weakest of the three original LPs is Bryter Layter. Joe Boyd's art-song production dangerously approaches the cocktail-jazz preciousness of Michael Franks. Still, the album features some of Drake's best writing—"Hazy Jane II," for instance, chugs along like good folk-rock should—and shows that he could be an inventive John Fahey-style acoustic guitarist.

Five Leaves Left and Pink Moon give a fuller, more compelling portrait of the troubadour as tortured artist. Lyrics grow increasingly despondent: "a troubled cure for a troubled mind" on Five Leaves Left becomes "Now I'm weaker than the palest blue" on Pink Moon. Arrangements are sparse without being rudimentary on the earlier LP, but by the time of Pink Moon, Drake was so depressed that he laid down bare voice-and-guitar tracks and stopped there. The result is one of the most restless, despair-ridden albums in pop music, and Drake's death two years later only makes it more morbidly intriguing.

Despite the nice packaging (each of the three regular-release LPs comes with its...
original cover art, and the enclosed booklet has a well-written, if hagiographic, bio and all the lyrics), there's something quaintish about Fruit Tree. Like Hannibal's recent Sandy Denny box, it appears designed to appeal strictly to completists and the already converted, thereby blocking out potential new fans unwilling to shell out $28.95. That's a shame, because while Nick Drake may be an acquired taste, his music remains vibrant and provocative. For a dowager of a guy, that is.

David Browne

VARIOUS ARTISTS:
Women in Rock.

Stephanie Bennett, dir. and prod. MCA Home Video 80428-19 (Beta), 80428-18 (VHS).

Cher (left) and Turner. What's to be learned?

Women in Rock is a terrible documentary. Considering that Stephanie Bennett did such a good job with her earlier efforts Girl Groups and The Complete Beatles makes it even more disappointing. Its scope is too broad for an hour, and the editing is awful, shifting haphazardly between chronological and thematic threads. There are plenty of talking heads—Tina Turner on racism, Brenda Lee on the roots, Bette Midler on black artists, Cher on going it alone, Darlene Love on Phil Spector, Grace Slick on the Jefferson Airplane, Bonnie Raitt on touring—but when random remarks are injected without any editorial vision (and some don't even pertain to the subject), it's impossible to draw any historical or sociological conclusions. It's unclear, for instance, whether it's easier now or just as difficult for women who sing or play instruments.

Clips zigzag from the '60s to the '80s and back again with transitions cliched enough to make the viewer wince. Example: Ronnie Cash comments on today's women not having to follow self-destructive paths; quick cut to Janis Joplin. And what's to be learned from then-and-now shots of sex symbol Tina Turner? That she loves wigs and has great legs?

The MTV excerpts—like those of Aretha and Annie, Madonna and Blondie—are already tired, and the archival footage is most-

ly overworked stuff. Of course, there are exceptions: teased-haired Lulu gyrating to "Twist and Shout" and fourteen-year-old Brenda Lee radiating innocent sexuality in "Sweet Nothin's." And there are a few decent interviews: Maria McKee's analysis of Joplin's influence and Exene Cervenka's comments on what destroyed her. But if you want the kids to see Cher's bellbottoms or to know why Janis is a legend, then rent—don't buy—Women in Rock.

Kate Waller

THE ALLMAN BROTHERS BAND:
Eat a Peach.


Even if this weren't a single-cd release (playing time: 69:44) of the double-LP Eat a Peach, it would remain a treasure for its uninterrupted version of "Mountain Jam," available for the first time in any format. Furthermore, the CD's detailed fidelity outshines the LP's sound and rejuvenates some of the most creative rock ever recorded.

Eat a Peach opens with the stunning rockers " Ain't Wastin' Time No More" and "Les Brers in A Minor," where a thundering rhythm section and Gregg Allman's bluesy organ are counterparts for Dicky Betts' fluid guitar licks. After the moody masterpiece of "Melissa" comes "Mountain Jam," seamlessly spliced into its full 33:40 glory by Polygram's Dennis M. Drake. The band weaves together gentle Grateful Dead-like doo-doo-ling, bubbly boogie, and fiery electric blues, periodically returning to the simple theme of Donovan's "There Is a Mountain." (still mistitled "First There Is a Mountain"). Through most of the recording, the CD's clarity showcases individual performances. There's no mistaking Duane Allman's biting slide guitar for Betts' silksweet tone when they play a synchronized bridge in "Blue Sky" and duel briefly in "One Way Out." And even percussionists Butch Trucks and Jai Johanny Johanson are disentangled. A dark mix does cloud the disc's first three songs, yet even here the sound surpasses that of the turbid LP.

The CD booklet lacks the wonderful original centerfold, so the LP is worth keeping, if only for the art.

Richard Price

(Continued from Page 73)
unfair. Though firmly rooted in that era, the
Wind has taken off every which way from
there to make a stick-to-the-roof-of-your-
mouth kind of pop that doesn’t sound dated
at all. So something as funny as “Stuck” isn’t
out of place near the wry “Sushi Bar.” The
most distinctive music occurs when the band
mingles electric and acoustic guitars and
duet vocals on “Good News, Bad News,”
“Nothing’s the Same,” and the title track.
Melodies go off in strange directions, as do
the themes of modern romance, poverty,
and just tight enough, to be fun.

Richard C. Walls

RAY MANTILLA SPACE STATION:
Synergy. Red VPA 196. (Polygram.)

PERCUSSIONIST RAY MANTILLA IS A LATIN
musician with a jazz sensibility who has
played with, among others, Max Roach. The
well-recorded Synergy features two jazz clas-
sics (“Star Eyes,” “Eronel”) and original
Latin numbers by Mantilla and by members
of his band, including the fine pianist Eddie
Martinez. Mantilla’s a precise, inventive
drummer, as the shifts of time and accent on
sometimes in a single piece. A great asset in
making this coherent is trombonist Glenn
Ferris, who sounds like a restrained Roswell
Rudd and whose sense of swing is impeccable.
But these are all seasoned pros who take
a relaxed approach to postmodern options,
and this is a concept, and a group, just loose
easy, and just tight enough, to be fun.

Hank Boudarit

THE BARRY ALTSCHUL QUARTET/QUINTET:

That’s Nice. Soul Note SN 1115.

Drummer Barry Altshul travels the
eccentric route here, moving from traditional
to freer forms with ease and conviction,
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