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FOR AUDIO INFO

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Stereophile Vol. 22, No 1
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JMLab Speaker, Sony A/V Preamp, and Meridian Amp

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Cover Photographer: Bill Kourinitis Studio
Cover Equipment: JMLab Cobalt 820 Speaker, Meridian 557 amp, and Sony TA-E9000ES A/V preamp

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A

though I go to the Consumer Electronics Show every January expecting to see new things, I seldom anticipate there will be any real surprises. That's because products and technologies typically are pre-announced in some way and because so much follows a natural, more or less predictable progression. But this year was different.

What was the surprise? Amazingly, not anything digital, except that it would be hard to do without computers to help with the necessary engineering calculations. It's a new approach to loudspeaker enclosure design, called Parametric Acoustic Modeling (PAM), that is said to yield a number of remarkable advantages over the now well-worn Thiele-Small method. Basically, there are five benefits: about 4 to 5 dB higher efficiency, very low distortion, precise control of frequency response, control of group delay independent of frequency response, and the ability to make group delay very low.

Of all of those, I would have expected the efficiency gain to be the most important, but after a demonstration I came away convinced that the most exciting thing about PAM is actually the lower group delay and distortion. For the first time in my life, I heard a recording of a drum kit sound close to the real thing.

The demonstration took place ina hotel suite of an Australian company, Whise, which developed PAM and several products based on it, and by its U.S. licensor and distributor, TMH Corporation. TMH stands for Tomlinson M. Holman, and Tom was on hand to make introductions and help with the demonstration and explanations. The Whise subwoofers are the first products to carry TMH certification, a program aimed at finding important new audio technologies and qualifying their performance for consumers.

The man who actually developed PAM was there, Graeme Huon, ironically, is a protégé of Neville Thiele. He points out that at the time Thiele and Small developed their ground-breaking analysis, there were two paths they could have taken: a lumped-parameter model or a distributed-parameter model. They chose lumped-parameter, perhaps largely because it is simpler computationally. In an era when people routinely have on their desktops more computing power than entire companies did 20 years ago, that's far less of an issue. Huon eventually went back and took the other road, developing a distributed-parameter model.

I won't attempt to explain PAM because I don't really understand it yet. But I can tell you that the inside of a PAM-designed speaker enclosure looks rather different from anything you've probably seen before. Sound travels through channels of various lengths and widths, which form acoustic impedances. It is the choice of those impedances that determines frequency and phase response—as noted above, independent of one another, which has never before been possible without electronic intervention.

PAM-designed enclosures exhibit the same rolloff slope below cutoff as conventional ported speakers, yet they can exhibit less group delay than equivalent sealed systems. At least that's the claim. If it proves true, it is quite an achievement.

The reason for the efficiency increase, by the way, is that PAM-designed enclosures incorporate no damping and thus throw away no energy. That, all by itself, will take a while for everyone to get used to.

You can find more information on PAM at the following Web sites:
Meridian Digital Surround Controller

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- 1 digital output (Tape and Zone 2)

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Fax (404) 346-7111

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http://www.meridian-audio.com
A Call for Help

My friend James Bongiorno, one of the founding fathers of modern solid-state circuit design, has a liver tumor as the result of getting hepatitis C from contaminated blood during surgery. Fortunately, his doctors believe that it has been detected very early and that it's 100% curable by further surgery. Chemotherapy will be virtually mandatory, to dramatically reduce the viral load and prevent recurrence of the tumor and progression of cirrhosis.

Needless to say, these medical procedures must be undertaken as soon as possible. However, because of his two previous liver operations, James has been unable to acquire insurance coverage. Therefore, a medical trust in his name has been established: Montecito Bank and Trust, 1000 State St., Santa Barbara, Cal. 93101; Attention: Ms. Krissi Wray, Service Manager (805/564-0220). Contributions will be greatly appreciated.—Bascom H. King

Hold onto Yer Jocularity, Corey

In her letter in your November 1998 issue (“Going Too Far?”), Janice Mancuso pointed out that Corey Greenberg’s July 1998 “Front Row” column contained (in addition to the title “Hum Job”) the word “mofo,” which offended her. Greenberg’s November review of the JBL HLS610 speaker raises the ante even further. In addition to the pubescent phrase “Hold onto yer jock...,” he takes the opportunity (that Audio gives him) to take the name of the Lord in vain twice. I wonder what percentage of your readership is Christian.

Having grown up in the ’60s and ‘70s, I like to think that I’m far from being a prude. However, my early amusement at Greenberg’s youthful, anti-establishment antics has waned. I happen to be an acquaintance of one of your “respectable” reviewers, and I suspect that Greenberg is a source of embarrassment to him. I know a couple of folks at JBL who are also likely to take offense at the use of locker-room dialect associated with their product.

Greenberg needs to work on his literary skills without the crutch of substandard English. And Audio needs to consider its audience more carefully. You didn’t find this type of trash in the 1947 editions, when the magazine was basically for engineers only, who were, at that time, virtually all male (better suited to locker-room jive).

Name withheld via e-mail

Measuring Up

I would like to know where D. B. Keele, Jr. found an amplifier that will put out 10,000 watts (“Equipment Profile,” Snell E.5 Speaker, September 1998). I know of only one amp that claims this feat. It runs on three-phase power and is manufactured by Crown under a different brand name. How is such a power output measured? Can a digital storage oscil
oscope be used to capture peak output voltage waveforms and then measure current into the same system and multiply the two? How can one measure peak output accurately? I would like to know of more sources of information on these types of measurements.

Jeremy Johnston via e-mail

Author’s Reply: Coincidentally, the amplifier that I am using is a Crown Macro Reference rated at a continuous output of 760 watts per channel, both channels operating into an 8-ohm load. Although it does not operate on three-phase power, its power cord is ¾ inch in diameter!

So where does the much higher, 10,000-watt, power rating cited in some of my speaker reviews come from? The higher cited power results from a combination of several factors:

1. The power quoted in my reviews is a peak rating, which effectively doubles the power rating of the amplifier. (My amp increases to about 1,500 watts, peak.)

2. The test amp is operated in its bridged mono mode, which effectively quadruples output because it doubles the amp’s output voltage swing. (My amp power increases to about 6,000 watts.)

3. The power cited is a short-term rating based on using a shaped tone-burst test signal whose crest factor is high. An amplifier’s short-term output power is always higher than its continuous power because its power supply does not produce any sag. (For my amp, the burst rating on this waveform is about 8,000 watts, which corresponds to swinging 250 volts into an 8-ohm load.)

4. The power is calculated by knowing the applied voltage and the rated impedance of the loudspeaker. The measured peak voltage is squared, and the result is then divided by the rated impedance (not multiplied by the instantaneous voltage and current). This is called the apparent peak power input (rather than the actual peak power input). Why is it done this way? First, it’s simpler. You only have to measure peak voltages. Second, it conforms to the way power is calculated in many standards for rating speaker power-handling capability. And third, it’s the logical way to do it because speakers, regardless of their impedance variations, are designed to be driven by constant-voltage sources. Because a speaker’s actual impedance is often much higher than its rated impedance, especially at middle and high frequencies, the calculated apparent input power is significantly higher than the actual input power because the amplifier can generate higher voltages into the higher-impedance load.

As for how to accurately assess peak levels, the peak output voltage of a power amplifier may be measured with an oscilloscope or an instantaneous peak-reading AC voltmeter. (A very rare commodity! None of the handheld digital voltmeters that I know of have this feature.) As a substitute for a peak-reading AC voltmeter, I have created a passive rectifier circuit to be used with a DVM that captures and holds a power amp’s peak voltage values.

Peak output sound-pressure level is ideally measured with an instantaneous peak-reading sound level meter or an equivalent, such as some devices made by B&K Instruments. If you can’t get one of these, use a calibrated microphone, preamplifier, and oscilloscope (or an instantaneous peak-reading AC meter). — D.R.K.

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Please call or write for complete information and the name of your nearest dealer.
Klipsch's Quintet Micro Theater System's satellite and center-channel speakers are made of Stone Mineral Compound, which the company says provides superior damping of resonances. Each has a MicroTractrix horn integrated into its front baffle to minimize diffraction. Sensitivity is rated at 90 dB at 1 watt/1 meter. The Quintet's subwoofer is powered by an internal 100-watt amp, has a frequency response rated at 34 to 120 Hz, ±3 dB, and will turn on or off automatically. The sub also has variable crossovers, and its polarity is adjustable. System price: $899. (Klipsch, 800/554-7724)

Two 1-inch trilaminate dome tweeters mounted on opposing baffles set at a 45° angle. You can switch between bipolar and dipolar radiation patterns to suit your installation. The f/x500's 6½-inch woofer and dual 1-inch tweeters are said to be capable of wide bandwidth and robust power handling. Price: $550 per pair, in black or white. (Polk Audio, 800/377-7655)

An internal amp rated at 250 watts powers the VA-1250X, which uses a 12-inch forward-firing driver and a 15-inch downward-firing passive radiator to achieve low-frequency response that Velodyne says extends down to 22 Hz. A current-sensing servo system monitors and adjusts the woofer's drive signal to reduce distortion. There's also a switch for bypassing the VA-1250X's internal crossovers for direct connection to Dolby Digital (AC-3) processors and receivers. The subwoofer's remaining controls are for volume, phase, and auto on/off. Price: $999. (Velodyne, 408/436-7270)

Inside the MediaTheater's shielded bandpass subwoofer is a 6½-inch driver, a four-channel amp, and a Dolby Pro Logic Virtual Surround decoder. Each magnetically shielded satellite has a 3½-inch driver. Controls include on/off/volume, surround level, and subwoofer level/test signal. With Dolby-encoded sources, the MediaTheater yields left, phantom center, right, and virtual surround images. A bypass switch selects normal stereo playback. System frequency response is rated at 50 Hz to 20 kHz, ±3 dB. System price: $299.95. (Boston Acoustics, 978/538-5000)
Nakamichi's MB-100, said to be the world's first high-end in-dash six-CD changer mechanism, also houses a 30-preset AM/FM tuner and a control array in its DIN-sized chassis. A second chassis houses a 24-bit D/A converter, an Acoustic Response Compensator (which fine-tunes spectral balance), and a preamp. It has four inputs—two coaxial digital and two analog—to facilitate system expansion. In addition, the CD changer/tuner's control panel is detachable, and a wireless remote control is included. Price: $1,000.
(Nakamichi, 310/538-8150)

ROTEL A/V RECEIVER

Each of the RSX-965's five internal amps is rated to deliver 75 watts into 8 ohms, all channels driven, from 20 Hz to 20 kHz, at 0.05% THD. Dolby Digital decoding is handled by a Crystal Semiconductor chip, DTS by a Motorola chip. All five A/V inputs have S-video and composite connectors. There are four digital inputs, two optical and two coaxial. The Rotel also has two tape monitors, a 30-preset tuner, an MM phono input, and a backlit remote that enables programming command macros. Price: $1,199.90.
(Rotel, 800/370-3741)

Knöll 12-Channel Power Amp

Intended for home theaters and custom installations, the MR1250 has 12 channels, each rated at 50 watts continuous output, with peak capability said to reach 100 watts per channel. An external voltage trigger can turn the amp on or off, and self-resetting circuitry protects each channel from over/under-voltage, overload, short circuits, and thermal runaway. Frequency response is 10 Hz to 40 kHz, ±1 dB. The amp has a level control, an RCA input, and five-way binding posts for each channel. Price: $949.
(Knöll Systems, 604/272-4555)

Stoner Pressurized Cleaner

This product is said to be ideal for cleaning dust from portable CD and cassette players, portable DATs, camcorders, VCRs, and other audio and video components. Gust Air Duster's colorless, odorless pressurized propellant, says Stoner, will not deplete the ozone layer. Each Gust cleaning kit includes three 15-ounce cans of Gust and one can of Xenit glass cleaner. Price: $19.95 plus $4.50 for shipping. (Stoner, 888/786-6375)

M & K POWERED SUBWOOFER

M&K says that despite its diminutive footprint of less than 1 square foot, the VX-100's in-room deep-bass response is flat to below 20 Hz. An internal 100-watt amplifier powers an 8-inch long-throw driver. The low-pass filter, adjustable from 50 to 125 Hz, can be bypassed to accept the subwoofer output of Dolby Digital and DTS processors directly. The sub's cabinet, available in a black or white lacquer bead finish, measures 12 x 14½ x 11 inches. Price: $795.
(M&K, 310/204-2854)
Proton A/V Preamp/Processor

The AS-2620’s Dolby Digital (AC-3) and Dolby Pro Logic processing can be monitored via its on-screen display and adjusted with its remote control. There are five analog A/V inputs and four digital inputs (two coaxial, one optical, and one AC-3 RF for laserdisc players). The volume control has a range of 85 dB, adjustable in 1-dB increments, and you can vary the six individual channel levels over a range of ±9 dB. Price: $999. (Proton, 562/404-2222)

SOUND APPLICATION
AC POWER CONDITIONER

Equipped with six duplex AC receptacles (totaling 12 outlets), the CF-2 is said to suppress electromagnetic and radio-frequency noise by as much as 60 dB across a 1-GHz bandwidth. Though it uses no current-limiting devices, the CF-2 provides 10-stage protection from electrical surges and spikes. Features include a machined aluminum case, a 20-ampere IEC input, and an internal Carlingswitch magnetic circuit breaker. Price: $3,000. (Sound Application, 510/525-1065)

LEXICON DIGITAL SURROUND PROCESSOR

Available in Home THX, Dolby Digital, and DTS versions, the DC-2 has a variety of proprietary surround and enhanced ambience modes, including 7.1-channel output capability. Lexicon says the DC-2’s refined 24-bit delta-sigma D/A converters in all eight channels yield sound rivaling that of esoteric, stand-alone two-channel D/A converters. Features include five video inputs (S-video and composite video), eight digital inputs, and low-frequency enhancement algorithms derived from psychoacoustic research. Prices: DC-2/THX, $2,495; DC-2/AC-3, $3,495; DC-2/DTS, $3,995. (Lexicon, 781/280-0300)

JOB D/A CONVERTER

The Job D/A converter, which features three switchable digital inputs (balanced XLR, coaxial S/P DIF, and optical Toslink), uses Alize technology licensed from Goldmund in Europe. Alize is said to deliver exceptional performance: distortion of 0.001% and time error across the bandwidth of less than 100 picoseconds. This D/A converter will accept digital signals of up to 24 bits. Price: $1,250. (Job Electronics, 805/530-0052)

Rogue Audio Mono Amp

Besides the ability to operate in pure triode or Ultra-Linear mode, the M-120 monoblock amp uses matched octets of KT88/6550 output tubes. Each amp is rated at 120 watts at 1% THD; typical THD is said to be less than 0.1%. The M-120 has an ultrawide-bandwidth output transformer with 4- and 8-ohm taps; frequency response is cited as 5 Hz to 50 kHz, ±1 dB. The amp’s slow-start, logical, power-on circuit is said to extend tube life. Price: $2,595 per pair. (Rogue Audio, 610/760-1621)
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Remote controls save energy—or, at least, save ours: no more leaping from the couch to change volume, program source, or TV channels. But the devices that use remotes also squander energy. When they’re “off,” they’re actually in standby, with some circuits keeping an infrared eye open for a remote “on” command (and, possibly, keeping some tube filaments warmed up for quicker turn-on).

According to researchers at the Florida Solar Energy Center and the Lawrence Berkeley National Laboratory in California, standby operation is just one of the ways that consumer electronic devices waste power when they’re not in use. Battery chargers, cordless-phone base stations, and wall-watt power supplies draw a bit of current all the time they’re plugged in. The clocks of VCRs and microwave ovens draw a trickle of electricity, too. Figures from Lawrence Berkeley reveal that “the average U.S. house ‘leaks’ about 50 watts” from such sources. This may not sound like much, but it adds up to 1.2 kilowatt-hours (kWh) per 24-hour day, or 438 kWh per year—about two-thirds the power used by a modern refrigerator and nearly 5% of the average home’s overall power consumption. (That’s actually a slight exaggeration, as each of these devices is sometimes in use, consuming more power but wasting less.) Nationwide, according to New Scientist, that’s “enough to power cities with the energy needs of Chicago or London.” And generating all that power (for which consumers pay from $1 billion to almost $3 billion a year) causes as much air pollution as 6 million cars.

Audiophiles, a small percentage of the U.S. population, inflate the power leakage disproportionately. Many of us leave our stereo equipment on all the time, in the expectation of improved sound; owners of equipment that draws lots of power at idle, such as tube gear and Class-A amps, seem especially likely to do so.

What can be done? As consumers, we can reform our habits, pulling the plugs on devices that would otherwise waste power or turning off their master switches (which are usually, alas, on the rear panel—if they exist at all). We can also look for energy-efficient devices, such as those labeled Energy Star in the United States, Blue Angel in Ger-

More on K-Stat

The K-Stat output transistors in Kenwood’s VR-2090 receiver, reviewed in last month’s issue, do, as Kenwood says, “incorporate the temperature sensor in the transistor itself.” I’ve just learned the reasons for this construction.

Most transistors’ gain and distortion characteristics vary with temperature and bias. Thus, as a transistor’s temperature changes, its bias should change to compensate. Conventionally, an amplifier’s heat sensor and bias adjustment are on its heat sink; K-Stat power transistors have them built in. As a result, says Kenwood, each transistor’s bias adjusts individually—and instantaneously, with virtually no lag between a temperature change and a compensating bias change. Kenwood also claims that, by optimizing bias at all times, this design technique improves reproduction of low-level signal details.
Division (formerly Ford Audio) will follow, and Samsung, and there's a strong likelihood that Ford's Visteon has been licensed to Alpine, Infinity, this year.

A color display is promised for late devices (such as a wireless e-mail CompactFlash slot to connect to other devices). The market. The $1,299 dose model is its AM/FM/CD head with voice recognition, an in-car navigation system, a USB port for communicating with palmtop and handheld PCs, and mapping software for navigation. Options include a GPS (global positioning system) navigation system, a USB (universal serial bus) jack, and a CompactFlash slot to connect to other devices (such as a wireless e-mail transceiver). A version with output for a color display is promised for late this year.

The AutoPC operating system, a version of Microsoft Windows CE, has been licensed to Alpine, Infinity, JBL, and Samsung, and there's a strong likelihood that Ford's Visteon division (formerly Ford Audio) will follow suit.

Many, Nordic Swan in Scandinavia, or Energy 2000 in Switzerland. (Some of the European labeling programs also cover product recycling.)

Some computer monitors, TVs, and other devices now carry the Energy Star label here, and the U.S. Environmental Protection Agency will have announced standards for home audio gear by the time you read this. Until 2003, audio components (including rack systems) that draw 2 watts or less in standby will qualify for Energy Star labeling, though DVD players can get away with 3 watts in standby. Starting in 2003, audio and DVD products will have to draw 1 watt or less to qualify.

Often, the circuits that cause energy leakage are not the ones being powered but the supplies that power them. According to Rob Frizzell of Power Integrations, which makes power-control devices, "Turn-on circuitry typically draws just a few microamperes. But a transformer-operated power supply, which is inefficient at low power draws, will consume a watt or two, maybe more, to provide those few microamps." The solution offered by Frizzell's company is a controller IC for switching power supplies, which is claimed to raise a supply's operating efficiency to about 70% ("90% if you optimize just for efficiency," says Frizzell) and whose power draw drops below 100 milliwatts when no power is required. For high-power applications, the standby functions could be handled by a separate supply using a Power Integrations chip; for very low-power applications, a single supply might suffice. These devices increase component manufacturers' costs by about a dollar or two per finished product and add about $2 to $10 to a product's retail price. However, the devices should eventually pay for themselves through reduced electrical consumption.

Roundabout Remedies

S

Sometimes, problems that afflict our stereo systems are easy to solve. (That's especially true if they affect just one channel.) But two problems I ran into recently were real head-scratchers.

The first was in my home theater, where replacing my powered sub raised the hum level from subliminal to loud. The sub didn't hum until my Dolby Digital receiver was hooked up to it and turned on—a ground loop, obviously. I tried the time-honored tactic of reversing the sub's AC plug and then the receiver's (not easy when both have three-wire plugs), to no avail. That left me with the other time-honored fix, replacing the sub's connecting cable with one whose shield contacts only the plug at one end. Before I could do that, however, the sub's manufacturer told me that my hum problem involved neither the sub's signal cable nor its AC cord but, rather, my cable-TV feed. To prove it, the company sent me a simple gadget that connects between my TV and the cable, passing broadcast and cable signals but interrupting the ground path.

That broke the ground loop, and the hum disappeared. There are several such gadgets on the market, including Mondial's MAGIC and Tributaries' GroundGuard, which cost about $100 each.

The second problem was in the sound system of my Merkur Scorpio, which suddenly went dead as I drove over a bump. Usually, that sudden a silence means the power has died, so I checked the DC going to the amp and equalizer (the head unit still lit up, so I knew power was reaching it); both were getting just under 14 volts. Next, I injected a signal into the amp from a portable radio's headphone jack; silence still ensued. In desperation, I checked the amp's four fuses (one per channel); all were good. No matter how I rummaged through the amp rack in my trunk, I could find nothing wrong.

And no wonder—the problem was up in the dash. A fuse had popped in the line that fed the turn-on trigger signal to my amp and EQ when the head unit was on. Replacing the fuse brought back the sound. But I still don't know why that bump made it blow.
Test Topics: FM Tuner Quieting

This is the second in our occasional series of "Test Topics," explaining standard graphs and measurements. Feel free to suggest other subjects for the future.

A graph of FM tuner quieting looks complex, because it tells us about many aspects of a tuner's performance. Once you know how tuners perform, however, it's easy to understand.

When there's no radio-frequency (RF) input signal at all, FM tuners produce only noise. But as the signal's strength increases, the tuner's audio signal output rises quickly to its maximum and the noise level drops and drops until, at some strong signal level, it's dropped as far as it can go.

The noise level in stereo is almost always higher than it is in mono, so tuners are often designed to switch to stereo only when the input signal reaches decent strength. In the tuner tested for the graph presented here, the transition occurs at about 27 dBf, indicated by the sudden jump in stereo noise (previously just about identical to mono noise) and the sudden appearance of a stereo crosstalk curve. (In mono, obviously, the two channels blend completely, so there's no separation between them.) If you extrapolate the slope of the stereo noise curve's missing section, you can see why the designer chose to do this: In stereo, noise would probably be about -27 dB at 15 dBf, only about 20 dB below the audio output at that point.

The reason the two noise figures don't match is that before the stereo circuits switch on, this tuner's audio output in stereo mode is as much as 6 dB lower than its audio output in mono. This difference occurs because only one channel of the RF signal in the test is modulated (the unmodulated channel's output is seen as the "Crosstalk" curve).

Many tuner measurements are made with a signal input of 65 dBf. The graph hints at the reasons: 65 dBf is enough signal to drive most tuners to their maximum quieting point in mono (and often, though not here, even in stereo), and it's far below the input level at which a tuner might overload. (Overload creates such problems as cross-modulation, which makes strong signals pop up at several points on the dial.)

As with most decibel measurements, "0" on the dBf scale does not mean no signal but, rather, the reference point for that scale: in this case, 1 femtowatt, or 1 quadrillionth of a watt (10^-15 watt). The presence of that nearly infinitesimal signal is enough to cause a slight divergence between the noise and the audio output level at the far left edge of the graph.

Potato Power

What fills the gap between tube circuitry and solid-state? Apparently, a vegetative state—otherwise, why would one high-end manufacturer list its amplifier's complement of "output tubers"?
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Klipsch® at the Orpheum. The 1950s-era Orpheum Theatre in Memphis, TN, was recently chosen by Turner Broadcasting to show the digitalized mastered movie, "Gone With the Wind." Recreating the magic every night required a significant sound system upgrade. The speaker of choice? Klipsch.
It was the sort of headline guaranteed to enrage all of those who believe that the United Kingdom should pull out of Europe before it’s too late. And yet I heard about this latest horror courtesy of a decidedly non-sensationalist breakfast TV news program, well before I got anywhere near a newsstand. But when I did get to one, right on the front page of London’s Daily Telegraph were the words, “Videoing the TV could be banned.”

Oh, to be a fly on the wall at Sony, Philips, JVC, or Panasonic when that story reached their head offices!

Mere scare-mongering by Europhobes? I don’t think so, although, if I had my way, the British would fill the Channel Tunnel with concrete and mount long-range cannon on the White Cliffs of Dover to keep out the French. My anti-Europe political leanings aside, even the most pro-“Euro-Superstate” fanatic would have to agree that it’s getting to the point where the word “Kafkaesque” no longer covers the insanity of the non-elected scum who make the rules for 270 million Europeans.

C’mon, no more taping your favorite programs for later viewing? Is nothing sacred?

But it is a genuine threat, in case you’ve forgotten all the ranting and raving in the early ’80s about how blank tapes (audio and video) should be subject to massive levies, designed to discourage tape piracy. And that’s what it’s all about: The vermin in Brussels, egged on by the home entertainment software companies, are convinced that every citizen of Fortress Europe is ripping off both the music and film industries by taping instead of buying. What they fail to acknowledge are three key issues: (1) The downturn in music and video sales has more to do with the unbelievable success of computer games in siphoning off vast amounts of disposable income; (2) the risible standards of the current pop market don’t exactly encourage CD sales; and (3) most tape piracy occurs in Pacific Rim territories, not in the United States or Europe.

It’s the last point that has aggravated so many. Go to almost any major Asian city, and you’ll find street vendors flogging umpteenth-generation copies of the latest films and albums, unhindered by the police. (Fact: The Hong Kong government made noises to the likes of Rolex and Cartier about how much effort it was exerting to stamp out counterfeit goods. Alas, the government also said it was having a hard time locating the factories. Curious, that, because the very first time I ever visited Hong Kong, nearly a decade ago, American—not local—friends took me to one of these very factories within two hours of my landing. And it happened to be on Nathan Road, Hong Kong’s answer to Fifth Avenue and Rodeo Drive!) I recall once going to Kyoto’s largest record store, surprised to find rack after rack of bootlegs; on close examination, the bootlegs proved all to be of material by non-Japanese artists. But try buying a pirate CD (let alone a bootleg) in the United Kingdom or the United States; the clampdown has been so successful that tape piracy in Europe exists mainly in the minds of paranoid lawyers and accountants working for the media giants, desperate to find a third party to blame. To put it more precisely,
they need a scapegoat to deflect attention from their own inadequacies.

But back to the revelations of Andrew Sparrow, the Telegraph's political correspondent who returned the issue of videotaping to the front line. He reported that Europeans could be stopped altogether from taping TV shows at home or (more likely) be forced to pay a new tax, courtesy of the copyright laws currently being rewritten in Brussels—the heart of the European Superstate.

As expected of the current right-on, touchy-feely British government, ever quick to give lip service (but little else) to consumer welfare, its immediate response was that it was "not happy" with plans to curtail the right of individuals to record programs for personal use. Furthermore, a campaign against a proposed European Union directive to harmonize copyright laws across Europe was launched at Westminster in December. Called the Fair Practice in Copyright Campaign, it is backed by the Consumers' Association, publisher of the U.K. equivalent of Consumer Reports, and other pressure groups, who warned that "all viewers would lose if the directive became law."

Normally, the word "harmony" appears in Audio in reference to a musical performance. In Europe, "harmonization" means that all citizens should suffer equally. Which reminds me of a lesson I was taught the very first day I spent in the U.K., a classic illustration of the difference between an American and an Englishman of the pre-Thatcher era: If an American sees his boss drive by in a Cadillac, he'll say, "I'm going to work even harder, and one day I'll have a Cadillac, too." If an Englishman sees his boss drive by in a Rolls-Royce, he'll say, "We should call a strike and bankrupt the bastard so he'll lose his Roller." Substitute "European" for "Englishman," and you've updated the axiom for 1999.

Fortunately for the Euro-skeptics, the announcement about abolishing the right to tape TV shows was made during the same month it became clear to all that the long-term plan for Europe is to harmonize taxes. This means that the British, for example, will have to pay the same destructive sales, income, and corporate taxes as, say, the Germans. Naturally, this harmonization doesn't mean that the British will also reap the benefits of German wages or Belgian car prices, but that's neither here nor there. Nor does this so-called harmonization mean that the British will be able to buy bootlegs or hard-core porn, both of which are sold quite openly in Holland, Italy, France, et al.

Hell, the British can't even legally buy Region 1 DVDs.

The Directive on Copyright and Related Rights in the Information Society was conceived to harmonize European copyright law, and it would therefore restrict the right of individuals to record programs for personal use, i.e., good ol' time-shifting. In its most extreme, totalitarian form, the directive could ensure that viewers are prevented from recording programs at home for their...
own use. How could this ever be put into practice?

Like the U.S., Europe is moving rapidly toward all-digital broadcasting. And when that technology becomes the norm and analog broadcasting disappears, encoding a spoiler signal or some other trigger to prevent recording will be a piece of cake. I, on the other hand, am convinced that no state steered by the French and Germans can be anything other than totalitarian, so I foresee the day when all recording equipment, short of answering machines, is either banned altogether or hamstrung for uses other than saving one’s own computer files or digital photos.

An unnamed Whitehall source “admitted that the campaigners’ fears were justified. It is fair to say that the directive could bar viewers from recording their favourite television programmes. We are not happy about this.” Another voice, Consumers’ Association lawyer Eileen Brennan, said, “The threat is real. At the moment, people can record Coronation Street if they miss it, but maybe in the future they will not be able to do it.” That would—or should—incite mass rioting, because Coronation Street is the U.K.’s longest-running soap opera. And can you imagine a typical British lager lout, violently drunk on 14 pints of beer, being told that he can’t record the football match he’d miss while out crawling from pub to pub? There’d be blood on the streets of Brussels.

Under Britain’s current, relatively sane and sensible copyright law, we are exempt from the rules protecting copyright when we videotape a program for personal use. But most European countries’ copyright laws are different and vary from country to country; many already apply a levy on blank tapes “in general terms to compensate copyright holders for the use of their material.” It would appear that that’s not enough.

None of us can argue against the idea that the film and music industries deserve freedom from the losses attributable to piracy. But why target those who don’t use their VCRs or tape decks for profit or gain? Quite clearly, those who make the rules in Brussels need a reality check. These bureaucrats are the same people who created “standard” banana and cucumber sizes and shapes to which all produce sold in Europe must adhere. They’re the same twists who pay massive amounts of money to farmers for not growing crops, at the same time letting surpluses pile up and rot rather than ship them to countries suffering famine. They’re the idiots who have yet to acknowledge that modern cars pollute less than cows’ backsides and who won’t allow the British to call their chocolate “chocolate.”

One day, long after my grandchildren have shuffled off this mortal coil, a revolution will occur, after which all will be revealed, e.g., which corporations back in the 20th century slipped money into which politicians’ pockets or, more likely, which pathetic little Belgian bureaucrat had a fight with his wife one morning and decided to take it out on the world. But what I’d really like to know is how much the CE regulations have cost the global hi-fi industry—through banning 4-millimeter connectors, placing unrealistic limits on RF output, ad nauseam. And then I’d like to find the jerk who thought ’em up and lock him in a room with 500 speaker and amp designers, all fired up on absinthe.

Which has probably been made legal again in France.

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Every family has its own special year-end traditions. This past Thanksgiving found the Greenbergs engaged in our usual home-for-the-holidays ritual, the one where I upgrade something in my parents’ home theater—at their request, I hasten to note—and they spend the rest of the time complaining that they can’t make their system work anymore. This year, what started things was the new A/V receiver I bought them, a really nice Harman Kardon to replace their old Pioneer. Of course, that meant a new remote for the receiver (and we all know how well the elderly embrace new things). Like all bundled remotes, it wasn’t the “learning” type, so it couldn’t be taught to control the CD player, the VCR, the DSS, or the swivel-base TV they’d yelled at me for in Thanksgivings past.

Like all family acts, we’ve honed ours into a real honey of a routine over the years:

Me: There, now, doesn’t that sound better?

Father: Feh! Who cares if it sounds better?! I can’t work this cockamamie remote!

Mother: Hasn’t your father suffered enough?!

Me: Here, let me see the remote—no, the other one—no, Dad, the other one.

Father: Is it so much to ask a son to just hook up the TV the way it was before?!

Mother: First you choose a profession that’s beneath dignity, now you want we should miss Matlock?!! What kind of monster did I bring into this world?!!

A few days later, I was on the flight home, asking the stewardess for five or six of those little bottles of airplane whiskey. In the midst of this, I got a great idea: I’d wangle review samples of two new mega-remotes, Marantz’s RC2000 Mk. II and Harman/Microsoft’s Take Control, put them through their paces in my own system, and then buy whichever one I liked better to give to my parents for Hannukah. The sweet, sweet liquor making everything all right again, I fumbled with the GTE Air-Phone and ordered up those mega-remotes.

The Marantz RC2000 Mk. II, of course, replaces the original RC2000, which quickly established itself as the high-end remote of choice. I’ve been using and praising this remote for years, and it’s kept me sane through hundreds of gear changes. I’ve tried all the fancy-shmancy learning remotes, the kilobuck LCD touchscreen jobs, you name it. But the Marantz is by far my favorite at any price, for the simple reason that it really does control everything in your home theater (well, almost everything—it won’t control my Pioneer big-screen). It does this no matter how much hardware you’ve got hooked up and is a pleasure for the human hand to twiddle. The buttons fall right where they should, the shape and balance are right-on—even for such a large remote—and
The $349 Harman/Microsoft Take Control remote, on the other hand, is an all-new design that answers the question, "If a couple of 300-pound gorillas had wild, sloppy sex, what would the baby look like, and, even more important, could it control my Pioneer big-screen?"

Looking like a cross between an overgrown Microsoft Mouse and a Palm Pilot, the Take Control does away with the many-buttoned approach of the Marantz and gives you a backlit screen to tap and a thumbwheel to diddle. It's a big, bulbous-looking thing, smartly retro and futuristic at the same time, in the manner of Apple's iMac and VW's New Beetle.

The new Marantz remote feels lighter than the Harman/Microsoft, and, at least in my hand, it felt more comfortable to hold and operate. I could be biased, living as I have with the original Marantz remote for several years now, but the Take Control did seem a bit more ungainly in my grasp than the new Marantz, which feels just like the old remote because it shares the same physical package.

Where the RC2000 Mk. II takes off is in the number of extra buttons Marantz stuffed onto it in answer to all the cries for dedicated channel up/down controls, DSS controls, and especially the ubiquitous menu, on-screen, and clear buttons everyone's got to diddle with when playing DVDs. Marantz has also swapped the positions for the numerical keypad and the CD/VCR/etc. transport controls, moving the numbered buttons to the bottom and the play/rewind/pause/etc. buttons to the middle, right where your thumb—which is definitely up, in recognition of this swap—wants them to be.

The new channel up/down buttons are not as optimally placed, though I'm not sure where else I'd put them. They're on the opposite side of the volume up/down buttons, making it a real thumbstretch. Like most RC2000 users, I'm sure, I've long since assigned channel up/down to the lil' cursor nubbies at the bottom of the remote, making the move from volume twiddling to channel flicking as easy and natural a thumb motion as da Vinci could ever have conceived. Ingrained as I am, I'll probably program the new Marantz's cursor nubbies the same way, but RC2000 fans who've been bleating for channel buttons will likely welcome the new configuration.

One new feature of the RC2000 Mk. II that does deserve a round of toasts is its nonvolatile memory. The old Marantz has the maddening habit of losing all of its settings when you change its four AA batteries, which you do every few months or so. Not the new Marantz. You set up this baby one time, teach it how to control everything in your rig, and then watch it roll over and shake hands too. But when it decides to play dead and you have to replace the batteries, it remembers everything you taught it. Even if the batteries go stone-cold dead. Man, I must have retaught my original RC2000 how to control my system a hundred times. The new Marantz's nonvolatile memory is a godsend and reason enough for RC2000 owners to trade up. Plus, Marantz has given the new version even more memory than the original, to answer critics who found that the RC2000 ran out of memory when they tried to store a very intricate system's command codes.

But if you want to talk ease of setup, the Marantz can't come within spittin' distance of the Harman/Microsoft Take Control. Because in many cases, you won't even have to point individual remotes at it and get them to "pitch" as this mega "catches" each and every last command. You have to do that with the Marantz, but the Take Control has its own automated, interactive setup routine. Its friendly onscreen menus ask you what kind of source component you wish to add to the remote, letting you scroll through a list of manufacturers (although here it gets a bit wacky: You telling me someone laying down 350 clams for a remote is more likely to own a Yorx A/V receiver than a Theta Casablanca surround preamp?) and then letting you try out different codes until you find the ones that correspond to your gear. It's so simple and easy and friendly and, well, Microsoft. Even if you despise the company, you're going to love how easy it is to get this remote up and running with your system. Take Control also comes with its own setup CD-ROM and PC interface cable if you want to really get in there and customize the bejesus out of it.

The Take Control is deceptively simple; while it looks much easier to operate than the Marantz, it's in hands-on use that you discover its complexity. I won't even get into the intensive macro routines you can program this thing to run, but suffice it to say that you could probably jolt the Pentagon's war room into DefCon 5 with a mere thumb twiddle. Alas, what I mainly found with the Take Control was the same thing I have found with every LCD touch-screen remote I have ever used:

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THE ULTIMATE IN HIGH-QUALITY SOUND: PARADIGM SPEAKERS WILL DO IT ALL — AND THEY’LL CRAZY, DADDY-O, THESE NEW PARADIGM WALTZ THE NIGHT AWAY OR SWING LIKE SEPARATE SPEAKER SYSTEMS FOR EACH, ACCURATE, WHICH MEANS NO MATTER PARADIGM SPEAKERS ARE SONICALLY MUSIC? IF YOU’RE PLANNING TO BUY WHETHER YOU WANT TO ROCK OUT, SHAKE YOUR HOME THEATER, TOO! THINKING ABOUT HOME THEATER? TODAY AND ASK TO HEAR THE PERFORMANCE SERIES! PART OF THE ALL-NEW PERFORMANCE SERIES!

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GOOD SOUND IS GOOD SOUND: WHETHER YOU WANT TO ROCK OUT, WALTZ THE NIGHT AWAY OR SWING LIKE CRAZY, DADDY-O, THESE NEW PARADIGM SPEAKERS WILL DO IT ALL — AND THEY’LL SHAKE YOUR HOME THEATER, TOO!

IF YOU PREFER USING LCD TOUCHSCREENS, YOU MAY FIND THE TAKE CONTROL TO YOUR LIKING.

and meanwhile I’ve lost the opening credits. To the Take Control’s credit, its tactile response is better in this respect than other LCD touchscreen remotes I’ve tried. But even at its most sensitive setting, I couldn’t get it to respond to my finger taps more than half the time. Like I said, maybe it’s me, so if you’ve had good luck with LCD touchscreens, you may find the Take Control more to your liking than I did.

Which is a shame, because if that remote had worked as reliably for me as the Marantz, I’d probably give it the nod. It’s far and away the better device for the average civilian—like, say, the rest of your family. As easy as the RC2000 Mk. II is to use once you get accustomed to its layout and features, it’s got more buttons than Louie Anderson’s trunk, and in looks alone it’s a little daunting to the uninformed.

But in the end, I chose the new Marantz for my folks. In the time I had the two remotes side-by-side to play with, it was the RC2000 Mk. II I kept coming back to for everyday use. Except for a bit less signal-throwing strength than the original (the new version seemed a little more finicky about how directly I aimed it at my gear, but this was more an issue of angle than distance), the Mk. II is better than its predecessor in every way. I want a mega-remote that’s going to give me maxi control with mini hassle—something I can use day in and day out, in the dark or with eyes closed, airplane whiskey or no airplane whiskey—and one that I know is going to make my system hop-to on the first button stab. I also know that if even one time the Take Control didn’t respond to my dad’s finger tap, I’d hear him yelling before my coat came off and my bags hit the guest room floor next Thanksgiving. So the Marantz it was.

On the last night of Hannukah, I called my parents. Here’s how it went:

Me: Dad, before you start yelling, let me walk you through the remote.
Father: What are you talking about? I’m already using it; it’s hot stuff!
Me: Really? You didn’t have any trouble with it?
Father: Trouble, what trouble? You want to talk about trouble, that Father Dowling, he’s had trouble ever since he left that show with those three goils, what were their names?
Mother: That was the other one. You’re thinking of Mr. Happy Days.
Father: I am?! Either way, those goils were some hot lookers!
Me: So, Ma, you’re happy with the Marantz remote? Both of you can use it all right?
Mother: Yes, dear, everything is much easier now. So when are you coming home for a visit? I’ve got all your old High Fidelity magazines stacked right by your nightstand, just like you left them when you went off to... [She starts sobbing into phone for the first time, ever.]

If you like LCD touchscreens and don’t have the trouble I do with them, you’ll probably find the $349 Harman/Microsoft Take Control remote to be the best you’ve ever seen. It’s packed with features and can do it all. But in the end, my hand preferred the $250 Marantz RC2000 Mk. II. If you loved the original, you’ll do backflips over the new version. It really is a better remote, and it’s what I’m going to use in my own system from now on. And, yes, it does control my Pioneer big-screen!
DON'T LET THE PRICE FOOL YOU

"I'VE HEARD HIGHLY REGARDED $2,000 2-WAY 6-INCHERS THAT COULD NOT KEEP UP WITH THE [$339] PARADIGM MINI MONITOR"
- Cory Greenberg, Audio

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If you're looking for equipment information or just want to talk to other audiophiles, online opportunities abound.
When someone got the itch to buy a new audio component, the first stop in years gone by usually was the newsstand. The goal was to stock up on magazines and read as many equipment reviews as possible. But now the first stop is likely to be the computer, the goal being to access the wealth of audio and video information available online.

Online sources of information can't replace specialty magazines. Few sites have the testing resources that the best print publications have, although they can certainly complement print. From online discussion boards, you can find out about other audiophiles' experiences with equipment you're thinking of buying. You can also visit manufacturers' Web sites to get more detailed product information than is provided in print ads and to get a different perspective from reviews that are published only online.

There are more audio-related Web sites than can possibly be described in a single article. Fortunately, almost all sites have links to other ones. And once you get started, it's easy to keep exploring. So load a Beach Boys disc into your CD-ROM drive, start your browser, and let's go surfing.

(The addresses of the Web sites mentioned here are listed in a box at the end of this article. Enter them in the address line of your Web-browsing software. If you want to visit a site repeatedly, you can create a "bookmark" so that you don't have to keep entering the address.)

We'll start close to home. Audio's sister magazine, Stereo Review's Sound & Vision, has just launched a new Web site. Sound & Vision is a brand-new publication, resulting from the merger of Stereo Review and Video magazines. Its Web site features product reports, music and video reviews, shopping tips, and a "hot topics" area covering such subjects as digital television and Divx. In the future, columns from the magazine and technical background articles will be added. The site also features direct reports from major industry conventions—the Consumer Electronics Show, for example. Some things, such as an HDTV programming guide and a buyers' guide to digital television, will be available on the Web site but not in the magazine.

That's the real attraction of the Internet: the ability to find information that's simply unavailable on the newsstand. Some audio-related sites are essentially online magazines, whose content is similar to what you'd find in a printed magazine. Others have information that can be culled only online, such as extensive appraisals of components by people who own them. You'll find commercial sites that hope to turn a profit as well as others that are simply set up and run by individuals with a passion for audio.

Audio Café is an online equipment directory that's supplemented by additional features. Its database of audio products is organized into four areas: home stereo, home theater, portable audio, and computer audio. Each has a short basic introduction. Within each area, you can specify a product category...
(DVD players, speakers, etc.) and price range; the site then lists products that meet your criteria. Each product listing contains a photo, the price, and rudimentary specs. (Speaker specifications, for example, include dimensions and weight but nothing about driver complement or crossover design.) And visitors can submit their own product reviews. The product database is very extensive though neither quite complete nor always current; a few prices are inaccurate. There’s contact information for manufacturers of all products in the database, including e-mail and Web addresses. If you’re searching for a particular type of product, Audio Café is a good place to start. This site also has a news section (though there’s not much news on it) and a section called “Her Fi” that addresses audio from a woman’s perspective.

At the Audio Review page, you’ll find reviews on thousands of different products, usually written by owners; occasionally, someone contributes a review based on a demo in a store or a friend’s system. Visitors, of course, are encouraged to submit their own reviews, which are organized by type of component and then by brand. Most are written by audio enthusiasts, not journalists or engineers, and many are quite penetrating. If you realize that most people are predisposed to favor their own equipment and ignore the reviews that are obviously prejudiced, this is a great place to find out about others’ experiences with equipment you may be considering. There’s also an extensive set of links to manufacturers’ sites plus a section for buying with equipment you may be considering.

There are other pretenders to that World’s #1 AV Publication on the Internet.” There’s also an extensive set of links to manufacturers’ sites plus a section for buy-with equipment you may be considering. If you’re searching for a particular type of product, Audio Café is a good place to start. This site also has a news section (though there’s not much news on it) and a section called “Her Fi” that addresses audio from a woman’s perspective.

At the Audio Review page, you’ll find reviews on thousands of different products, usually written by owners; occasionally, someone contributes a review based on a demo in a store or a friend’s system. Visitors, of course, are encouraged to submit their own reviews, which are organized by type of component and then by brand. Most are written by audio enthusiasts, not journalists or engineers, and many are quite penetrating. If you realize that most people are predisposed to favor their own equipment and ignore the reviews that are obviously prejudiced, this is a great place to find out about others’ experiences with equipment you may be considering. There’s also an extensive set of links to manufacturers’ sites plus a section for buy-with equipment you may be considering.

Audio Revolution bills itself as “The World’s #1 AV Publication on the Internet.” But there are other pretenders to that throne (see the review of SoundStage!). This is an attractive, polished site where you’ll find subjective reviews (no measurements) on a variety of products, from Sunfire subwoofers to a preamp/power amp combo by the British manufacturer Magnum to an EAD preamp/processor to Pioneer’s plasma video display. There are also reviews of new movies, DVDs, and music CDs (except classical). Articles are well written and well edited, and they are plainly based on careful listening/viewing. Refreshingly, Audio Revolution’s reviewers pay attention to things like fit, finish, and usability. Occasionally, reviews betray a lack of technical knowledge. For example, the reviewer of a Pioneer DVD/laserdisc player seemed unaware that laserdisc is a composite video medium and that a composite connection might be preferable to an S-video connection for laserdisc if the TV’s comb filter is superior to the one inside the player.

E-town contains news items and columns on topics ranging from high-end audio to digital television (DTV) and computers, as well as a DVD release list. Articles are written by freelance authors and in-house staff, complemented by stories published in Twice, a consumer electronics trade publication. Some stories have a mannered, consumer-watchdog tone, while others fall into the gee-whiz category. Most are nicely written and timely, and some are genuinely insightful. If you want instant coverage of a major event, such as the Consumer Electronics Show, E-town is a good place to look. On the other hand, its message boards, which cover such subjects as DVD, DTV, high-end audio, and “beer-budget” audio, have the worst “S/N ratio” I’ve encountered online. Einsteins with handles like Cud Bucket and Porn Monkey trade insults and, occasionally, information. In the high-end audio message board, one poor soul who asked for advice on how to use different preamps with the same power amp (he wanted to use one preamp for home theater and another for music) was roundly trashed, even being told “it’s a good thing breathing is automatic.” Another regular, though, rushed to the inquirer’s defense and, using foul language, took his tormentor to task. And so it goes. Surfers with patience will find useful information on E-town’s message boards, but they’ll have to filter out the noise first. Happily, manners in cyberspace have improved markedly in the past few years, and this sort of nonsense is becoming less common.

The discussion at the Home Theater Forum is far more civilized—the site won’t tolerate personal attacks—and its participants are generally well informed. In addition to welcoming opinions on a multitude of topics, the site has a small number of equipment reviews. This is a good place to pose any questions you have about home theater or to find out about others’ experiences with products you’re thinking of buying.

SMR Home Theatre on the World Wide Web is run by British technology journalist Stuart Robinson. Equipment reviews are as varied as the contributors themselves; most are written in a conversational tone and, as with most online A/V magazines, are subjective. You’ll find reviews of products as varied as a Panasonic DVD player, several models of Polk Audio and NHT speakers, and a Conrad-Johnson integrated amplifier. This site has a policy of posting only positive reviews, not because it’s “sold out” (it doesn’t accept advertising) but because its contributors don’t solicit review samples of products they’re dubious about. In fact, I think
CAVEAT EMPTOR: SHOPPING ONLINE

The Internet is a great source for product information, and it can also be a good place to buy A/V gear. Internet merchants often have lower prices than conventional stores. And if you're dealing with an out-of-state company, you'll usually avoid paying sales tax, although shipping charges may offset this saving.

A few of the many companies that sell mainstream equipment over the Web are Crutchfield, J&R Music World, One Call, and Sound City (see the box at the end of this article for addresses). High-end equipment is available online through Audio Advisor, and there are specialized Internet merchants, such as Cassette House (blank recording media), Digital Eyes (DVDS and laserdiscs), and Minidisco (MiniDisc equipment as well as accessories).

You can also find used equipment online. Audio Review and Audio Revolution both have classified ads sections, and used equipment is often advertised on the newsgroups. At Audio Shopper, you'll find thousands of classified ads for used gear.

When selling online was beginning to take off a couple of years ago, people worried about con artists intercepting credit-card information and using it to rack up charges. That risk was never very great; now that most Internet merchants use secure servers, it's minuscule. (With a secure connection, your Web-browsing software encrypts information before it's sent out onto the Net, and the merchant's server decrypts it. Encryption comes in 40- and 128-bit flavors, with the latter, obviously, being better.)

The main risks of Internet commerce are the same as phone and mail ordering. Will the merchant actually ship the product? What happens if it's defective? What happens if it's lost in transit? What happens if there are problems dealt with quickly?

* Be suspicious of prices that are dramatically lower than those available elsewhere.

* If you're paying by credit card, make sure the merchant has a policy of not billing until goods are shipped. And make sure all the terms are completely clear: the total cost (including shipping and handling), return policies, warranty, etc. Terms are usually posted on the site.

A credit card is probably the safest way to pay for online purchases. If you don't receive the goods, you can complain to the card issuer. Then, if the merchant can't prove to the card issuer that you ordered and received the goods, a chargeback will be applied and your account credited. But the process involves a fair bit of time and hassle. However, if you've paid by check or money order, you have no such recourse. With C.O.D. shipments, you at least know you received a package, but you can't see what's in it until you've paid the carrier (usually by cash, certified check, or money order).

Unless you're buying from a dealer, credit cards are rarely involved in used-equipment purchases. While some sellers will ask for cash up front, C.O.D. is usually acceptable, but, as stated above, there's no chance to inspect goods before paying for them. And because the condition of used merchandise varies far more than the condition of new equipment, your best bet is to buy from a seller that is within driving distance so you can check out what you're buying before you pay for it.

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other, GoodSound, offers reviews of more affordable equipment than the high-end gear featured on SoundStage Live! Nor GoodSound is as visually distracting as the main SoundStage! site. The reviewing approach and writing style, though, are much the same.

In newsgroups, you'll find information about used equipment for sale and people seeking it. (I saw adjacent messages, for example, offering a 1946 wire recorder and a Nakamichi Dragon cassette deck.) People seeking and offering opinions on specific components, plus those asking for and providing advice on solving system problems, are online as well. The discussions are as varied as the individuals taking part in them. Because newsgroups aren't moderated, they're sort of the wild frontier of the Internet. Some boors do hang out on the A/V newsgroups, but most of the discussions are surprisingly reasoned, informed, and polite—though there is a fair bit of off-the-cuff opinion. From

CompuServe.

Of the sites devoted to DVD, my favorite is the DVD Resource Page. This is a labor of love for Steve Tannehill, who toils as a software engineer in Dallas by day and watches movies and writes articles about them by night (or very early morning). Besides its more than 250 perceptive DVD movie reviews, you'll find DVD-related news, updated daily, and a forum where you can ask questions and answer other people's. You'll also find useful background articles on such subjects as Easter eggs (hidden features in DVDs) and anamorphically squeezed discs.

For an even newsier approach to DVD, point your browser at The Digital Bits. The news stories and well-written rants by Bill Hunt, who owns and maintains the site, are updated daily. Last summer, Digital Bits had daily reports from the Video Software Dealers Association convention in Las Vegas, outlining film studios' plans for DVD. Another section lists planned DVD releases by the studios. In addition, there are movie reviews and a limited number of equipment reviews plus links to many other DVD-related sites.
While the movie reviews at The DVD Post are generally mundane, this site is still worth visiting for its extensive list of current and upcoming DVD titles and its list of DVD rental locations.

MiniDisc fans should check out the MiniDisc Community Page. This is the work of Eric Woudenberg, a Bell Labs research scientist who became interested in MiniDisc during a six-year stint in Japan. The site has an extensive list of MiniDisc products (including photos and, in some cases, reviews contributed by readers) and links to other MiniDisc-related web pages. Most interesting, however, are the frequent updates contributed by Woudenberg and his readers. One recent intriguing item described a TOC extender that lets you get 80 minutes of stereo audio onto a 74-minute disc. Unfortunately, you need a special master disc, and there was no hint as to how to get one.

A private site maintained by Peter Kant has well-considered, well-written FAQ (frequently asked questions) pages about all types of audio components. The now-retired Kant formerly worked as a recording engineer for Bulgarian State Radio. This is a good site for anyone who wants to bone up on some basic audio theory or needs helpful advice.

Several industry and professional organizations' sites are also worth checking out. The Audio Engineering Society's Web site has information on the organization and its publications (including its preprints of convention papers, which can be bought through the site). The site of the Academy of Audio Engineering Society contains A/V-related news stories and links to member companies.

If any site whets your interest in a new component, information is a mouse-click or two away. Not only is the Internet the world's biggest newsstand, it's also the world's biggest brochure rack. Almost all equipment manufacturers have Web sites where you can get product info and read product reviews. Most also list their dealers, so if you want to hear the product in question, you can usually find a retailer near you.

There are far too many manufacturers on the Web to list here. Fortunately, besides the company listings at the back of Audio's Annual Equipment Directory (in the October issue), there are several sites that do just that. The Enthusiast's Page is a well-maintained site with more than 2,000 links to equipment manufacturers, dealers, and organizations involved in consumer electronics. You'll also find links to manufacturers' pages at a site maintained by Steve Ekblad, who works for a Chicago-area audio chain.

Another great source for links to manufacturers is a Norwegian site called HiFi on WWW. A related site has links to just about everything published about DVD.

It's easy to spend hours surfing through online magazines. And once you get to the manufacturers' sites, those hours can turn into days. So make sure your Internet provider gives you a liberal amount of monthly connect time. And make sure you leave some time for listening to music and watching movies!
When high fidelity was in its infancy, hobbyists and manufacturers alike looked to film sound for inspiration. The first hi-fi systems that Avery Fisher cobbled together for friends had second-hand movie-house amplifiers. JBL and Altec, both makers of theater speakers, were important names.

Decades later, the power and the glory that high fidelity had come to enjoy began infiltrating the film industry. Cerwin-Vega provided theater speakers and amplifiers for the sonic stunner Earthquake. More important, Dolby Laboratories, well known in hi-fi for its system that reduced tape hiss, developed Dolby Stereo, a convenient way to bring genuinely high-fidelity four-channel sound to movie theaters.

In 1977, George Lucas's Star Wars was released in Dolby Stereo. It hit like a thunderbolt, and multichannel movie sound rocketed to the forefront of public consciousness. Today, with dynamic soundtracks fueling record-setting box office receipts and home theater booming, a circle has closed. And because it now appears that few people will buy separate audio-only home entertainment systems, established film-sound parameters are certain to influence the anticipated standard for multichannel music recording. The movies are poised to influence hi-fi's future once again.

Laurie Fincham is uniquely positioned to understand both the world of high fidelity and that of cinema sound. An internationally recognized loudspeaker engineer who, during a 25-year stint with KEF, pioneered the use of computers in speaker design and evaluation, Fincham is a recent emigrant in two senses of the word: In 1993, he relocated from his native England to California to become Senior Vice President of Engineering at Infinity Systems. After more than four years there and a few months as an independent consultant, he crossed another border and joined Lucasfilm as Director of Engineering for its THX division.

Since January 1998, Fincham's job has been to further the THX mission: assuring that multichannel movie soundtracks are heard, both in commercial and home theaters, in precisely the manner their creators intended.

D.L.
The signals are spread across the rear soundstage, and you don't have two surround signals and then alters their relative phase response. This localizable lump. It continues to be a relevant issue, the decorrelation circuit looks for the similarity between the big, lumpy, soggy thing—that didn't externalize correctly. Essentially, the decorrelation process is used to correct this, so you hear the same thing in the home as you would in the cinema.

**What, specifically, is re-equalization?**
During the recording process, film sound is usually balanced with boosted high frequencies. This compensates for the inevitable high-frequency attenuation that occurs in the theater, because of listening distance and absorption. As a result, when a soundtrack is replayed in the home, it often sounds too bright. Re-equalization corrects this, so you hear the same thing in the home as you would in the cinema.

**And timbre matching?**
In a surround sound system, the surround speakers are often at the sides of the listener or even behind him. Timbre matching is a process whereby the sound quality of the surround speakers is adjusted until it matches the timbre of the front speakers and compensates for their different positions within the room.

**And decorrelation?**
Decorrelation is a process that ensures the surround speakers will produce the correct spatial effect under all conditions. With the original Dolby Pro Logic system, we had the two rear speakers producing a double mono signal that resulted in a phantom image—a big, lumpy, soggy thing—that didn't externalize correctly. Essentially, the decorrelation circuit looks for the similarity between the two surround signals and then alters their relative phase response. The signals are spread across the rear soundstage, and you don't get this localizable lump. It continues to be a relevant process, because many films are available with only the original Dolby Surround soundtrack.

You also specify a form of peak management. In 5.1 soundtracks, there's often a great deal of bass information. The peak management system automatically protects the subwoofer from overloading.

**What is speaker position time synchronization?**
Not all speakers are equidistant from the listener. When there are significant differences or you're sitting in some asymmetric way, it's important to resynchronize the sounds, through the use of delay circuitry, to make sure they arrive in the right order.

THX recently devised a new set of standards called Select and renamed the original set THX Ultra. **Why?**
The Select specification allows design economies by modifying performance requirements to fit a new set of conditions. It was based on the premise that not everybody has a large listening room or the desire to listen to film sound played at the same levels as in a theater, which was the purpose of the original THX specification. We did a lot of testing to find out how receivers worked—with real music, not sine waves—and came up with a spec aimed primarily at very good but affordable receivers.

We retained the patented technologies, so you had everything you had before except you had it all in one box. This was coupled with the recognition that a more typical room would be closer to 2,000 square feet than 3,000. The smaller room brings about two things: First, the same amount of power output from the speaker results in a higher listening level—you can actually turn the volume down and still have the same level. Second, in a smaller room, because you're going to be somewhat closer to the speakers, the reflected sound is of less importance. That meant we could relax some of the directional requirements of the speakers—which had led to considerable complexity and cost—without reducing their sound quality. We also included in the Select specification an alternative category for monopole surround speakers. Providing it was designed correctly and had the correct timbral match to the front speakers, a monopole would be a very good, cost-effective alternative to a dipole.

**And addressing manufacturers' concerns about peak management?**
You can't just write a standard from a lofty height. You've really got to be practical and design something that makes sense from a manufacturer's point of view as well as from a performance point of view.
You’ve said you do a lot of incidental research as well.
You can’t test things without knowing how they work. Quite a lot of
what we’re doing is on how people hear sound and the way they re-
act to it. Because we have Skywalker Ranch, which is one of the
busiest and most important cinema-sound establishments in the
country, we get to talk to the sound designers about what they’re
doing and how they do it. A large percentage of the most important
films are mixed down at the Ranch, so we have the opportunity to
see and hear this stuff firsthand.
How many engineers does THX currently employ?
Ten.
Is the division involved in manufacturing?
On the professional side—digital crossovers, analog crossovers, lit-	le monitoring systems for multichannel recording. We design a few
things like that, have them made for us, and test them all here. It’s
generally in new categories that we would do this. Let’s say we see a
part of the business emerging where there are no established stand-
ards. Simply writing a standard is not sufficient if the specified
equipment isn’t available. If necessary, we satisfy the
What does the theater alignment program involve?
TAP is a quality-control service for theaters. We go in and actually
do a great raft of tests, not only to maintain and quality-assure film
sound but also to maintain picture quality.
THX gets involved in the design of specific theaters, does it not?
Yes. We have a design department that goes through architects’
drawings and makes recommendations on shape, layout, acoustic
treatment, number of speakers, size of amplifiers, and so forth. If it
goes ahead, they get the stuff installed and send a technician over to certify the thing. We do measurements in the hall and on the
electronic equipment. To date, we have certified about 3,000 the-
aters around the world.
And there’s a digital mastering program.
We supervise the transfer, via telecon, of the original film to a digi-
tal master tape from which we are able to make dubs for producing
DVDs, laserdiscs, and VHS tapes. It’s another part of the chain, if
you like: the optimum transfer from film to a digital master tape.
THX recently announced a service called PM3. What is it?
PM3 stands for “professional multichannel monitoring and mix-
ing.” It’s a design and consulting service for recording studios that
need 5.1-channel capability for film, video, and TV, and it’s derived
from our 10 years of experience in theater construction as well as
nearly 10 years in high-end home theater. Also, we gained a great
deal of experience at Skywalker Ranch, where many rooms are used
for monitoring and it’s essential that they’re similar in sound quali-
ity. From this experience, we wrote a set of standards that tells peo-
ple how to build their own rooms for monitoring purposes yet
maintain a consistency in performance. So it’s a consulting service,
and part of what we do is provide customers with standards they
should adhere to for the replay equipment, the room layout and
acoustics, the distance from the listener to the screen, and so forth.
These standards will also be applicable to multichannel music
recordings.
What are the implications for home music listeners?
When multichannel sound becomes the standard, there will be
conditions under which it can be recorded. That means, in our
Home THX program, we can pretty well guarantee our replay sys-
tem will do the best job with multichannel music.
In the absence of a multichannel music recording standard, we’re
seeing more and more speakers optimized for movie soundtracks.
Does this have negative implications for serious music listeners?
While all this settles down, I think, you are going to get home the-
ater systems optimized for film soundtracks, particularly spectacu-
lar soundtracks. In the same way that some speaker and replay sys-
tems were optimized for rock ‘n’ roll, you could argue that some
home theater systems are optimized for Bruce Willis. They’re not
for sonic purity, because it’s all biff, bang, wallop, but I think it just
reflects the infancy of that particular part of the industry.
Will sonic purity eventually play an important part in films?
As sound designers become more familiar with the possibilities of
multichannel soundtracks, there will be less concentration on the
obvious novelties and it will mature—much the way stereo did,
away from the sound of passing trains and games of Ping-Pong.
The film industry won’t be resolutely directed at blockbusters for
17-year-olds. There will be other, thoughtful films, where what the
actors are saying is as important as what they’re blowing up.
And music will be a key element of at least some of these movies.
Absolutely. Even from a commercial point of view, Titanic’s success
was as much to do with the music on the single that came out of it as
it was do with the film. In other movies, probably more so: The mus-
ic in Rob Roy, for example, had some very nice orchestral bits in
the beginning, with some lovely shots of Scotland.
How will speaker design reflect this? You maintain that most—not
all, but most—speakers are ultimately optimized for the kind of pro-
gram material favored by the largest number of people. The segment
that prefers orchestral film sound to special effects, however, is like-
ly to be relatively small.
The point about optimizing a speaker for one particular applica-
tion is that, in the end, that’s the only thing it’s good for. My view is
very simple: All speakers should be completely neutral transmitters
of the original program material. Neutrality relates to the timbral
balance, which in turn depends not just on frequency response but
also on the speaker’s directional characteristics. With existing film
soundtracks, dipoles are an excellent choice for surround speakers.
In the future, the nature of soundtracks may change, so it’s impor-
tant that we develop systems that have an inherent flexibility, that
do the best possible job with any source material. I’m suggesting
that the directional characteristics of speakers be variable, so they
can change to suit the particular program material being replayed.
What will trigger the required changes?
I believe DSP will be the key to that. There will probably be some
flag encoded in the program material that tells the speakers to have
a particular directivity for a particular application. That would be
much more sensible than having everything polarized, where you
could play this material or that material but not both. You don’t
want to have a speaker that is one-size-fits-all.
Are speakers with variable directivity part of the industry’s future?
Technically, there’s absolutely no reason why it shouldn’t happen.
And since it could happen, it probably will.
As multispeaker systems are currently configured, how important are
the various channels?
Ranking the reproducing channels in order, I would say that the center channel is most important, followed by the subwoofer and the surrounds. The reason I choose the center channel is because it contains the dialog, which allows you to follow the film. A lot of soundtracks are difficult to follow anyway, so it’s very important that the reproducing system doesn’t add to that difficulty.

**How crucial is a center channel to music listening?**

I’m biased here. I think the center channel is really a good thing, and I think everybody will be grateful for it in a few years—once they get used to the idea of more speakers. They’ll find that their overall enjoyment of the performance is greater, and greater over a wider listening area. Clearly, the center channel does a much better job with center images, but more important than that, it has a more accurate timbral quality that cannot be achieved with a system in which the left and right channels are creating a phantom image. That’s particularly true on voices. If you doubt it, turn the balance control and take the sound out of one speaker. That will always sound more accurate.

**Audiophiles make a big fuss over imaging, but you tend to minimize its importance. Why?**

I think it’s true to hi-fi, not to a musical performance. Two-channel stereo was always going to be a compromise, but in the end, that compromise became an art form in itself.

**Part of which is setting the system up precisely and, even then, being limited as to where the listener sits.**

I call it hair-shirt audio. It’s a difficult thing to enjoy in a social way. It’s okay for one man or one woman, but it’s difficult for it to be a group experience. Home theater is a family-type thing. Two-channel stereo has become more and more accurate about less and less; that’s the way I feel about it. In the end, music is to be enjoyed. Nothing must grate on you. There are aspects of multichannel sound that are really rather pleasant. In some cases, they’re more true to life, but if they can’t be true to life, let them be peripheral.

You’ve said that multichannel sound has a “womb effect.”

Yes. It surrounds you. It’s warm, comfortable, enveloping—a wholly pleasurable experience. It isn’t a very difficult thing to enjoy. It’s not a super-aesthetic thing. Nowadays, probably more people listen to music in cars than at home. In a car, stereo accuracy is nearly impossible, yet despite this, the overall effect is extremely pleasant. It’s enjoyable because it’s all around you.

**What advice would you offer engineers who previously designed speakers for music and will now have to add film sound to the mix?**

Don’t ever give up on the things you thought were important. Keep on doing what you did before, but be mindful of the special demands of the soundtrack. I’ve always argued that a home theater system isn’t different; it simply wants more. In other words, there are greater demands in terms of bandwidth and level. And probably the speakers have to be rather more efficient than regular hi-fi speakers to prevent having a room full of power amplifiers.

**You’ve cited the “sheer intrusiveness” of multiple speakers in a room. How can that be minimized?**

Installing in-wall speakers is a really good way if you don’t mind making a commitment to keeping your house. There are now excellent-quality in-wall speakers. We have certified in-walls for the left, center, and right channels as well as for the surrounds. And clearly there will be improvements in the way you get your sound around to the various speakers in the room. There’ll probably be daisy chains with digital links or something like that, so you won’t have to run scads of wires from your central receiver or multiple amplifiers. There are experiments with wireless links; they tend to be a little bit on-and-off in quality or rather expensive, but they will get better, because the need to drive information around the house is going to become ever greater. And when it does, it’s going to make speakers neater and tidier to incorporate. That’s a key issue: How do you make speakers smaller and less obtrusive yet at the same time keep the quality up?

**How do you?**

I think you do it by caring, as much as anything else. If you care enough about it, you’ll find a solution to it.

**Can virtual channels be used for serious music listening?**

Absolutely. In a way, you’d almost be going back to two-channel stereo. What I mean by that is, these virtual systems do depend very largely on your being at a specific position with respect to a limited number of speakers. But if, for other reasons, you’re happy to sit there, the effects are quite outstanding; they’re less dependent on the acoustics of the room than practically any other system. You can have two speakers that are no more than 6 or 8 inches apart and do all this. It’s absolutely amazing.

**Given the innovations digital technology has produced, where do you expect the best-sounding new speakers to come from?**

The independent designers will have to carry the torch for good sound. The reality is that most loudspeaker designers do as they’re told.
If you're not inclined to spend several thousand dollars on a set of high-end speakers, don't worry. You don't have to.

Paradigm® Reference speakers... eminently satisfying state-of-the-art sound that heightens the sheer enjoyment of music and home theater.

Visit your nearest Authorized Paradigm® Reference Dealer today and experience these spectacular speakers for yourself.

Compare them to the most expensive speakers you can find. You'll be amazed.

www.paradigm.ca
To call Sony's new TA-E9000ES preamplifier “full-featured” verges on understatement. That might not be immediately apparent from the deceptive simplicity of its front panel, but it’s hinted at by the panel’s string of logos (Dolby Digital, DTS, and MPEG Multichannel). To decode those surround formats, the 9000 has a 32-bit floating-point processor (the first such DSP chip used in a home high-fidelity component, Sony says). A pair of 32-bit fixed-point DSPs add the usual enhancements and embellishments (and then some). This preamp’s innovative controls and setup facilities include a novel volume-control circuit. As a preamp should these days, the 9000 has plenty of analog and digital audio connections and analog A/V connections. And then there’s the remote, which more than deserves to be called full-featured in its own right.

Whatever your choice of program sources, the TA-E9000ES will likely accommodate them very well. On the audio front, it has analog connections for a moving-magnet phono cartridge, a tuner, a CD player, and two recorders (nominally designated “MD/DAT” and “Tape”). Its A/V connections include inputs for three sources and outputs for three video recorders. Sony also offers digital audio inputs for four sources and a digital output for the “MD/DAT” recorder. (This output can be used only for digital sources; the signals the 9000 digitizes from analog sources are not fed to this jack.)

The TA-E9000ES has Toslink optical connectors for all digital inputs (and for the “MD/DAT” digital output). The “CD” and “DVD” inputs also have S/P DIF coaxial jacks, and the laserdisc (“LD”) input has coaxial jacks for S/P DIF and AC-3 RF signals. (While I’d like to see coaxial and optical digital connectors for every source, having three such inputs gives the 9000 an edge over much of its competition.) All coaxial connectors and the “DVD” Toslink input can handle sampling rates from 32 to 96 kHz and word lengths up to 24 bits, but the remaining optical inputs cannot.

Analog line outputs are provided for two powered subwoofers and two center-channel power amplifiers; there are single outputs for each left and right front and surround channel. On the A/V side, the TA-E9000ES has outputs for two video monitors. There’s an external video “Processor” loop, into which you can connect a titler, a composite-to-S-video converter, or other video components. Because the processor loop precedes the video recording outputs, whatever the processor does to the picture can be recorded as well as displayed—a rather nice and thoughtful touch.

Without exception, every video input and output accommodates composite- and S-video signals but not component-video signals. The omission of component video follows the pattern of most A/V components rather than leading the way, as a component of the 9000’s stature should. It is time for the audio industry to come to grips with reality, acknowledge the benefits of component video, and provide for it.

The list of audio, video, and digital jacks (all gold-plated, by the way, for better reliability) does not quite cover all of this preamp’s rear-panel connectors. On the mundane side, there are two switched AC convenience outlets with a 1-amp total rating. A bit more interesting are the jacks for...
the S-Link control system, for daisy-chaining with other Sony products (such as its TA-N9000ES five-channel power amp, CD players, and recorders) and operating them all from the preamp’s remote. A separate jack enables a Sony TV to turn on when the preamp does.

But what really caught my eye on the back were a mini-jack labeled “Analyzer/MIC In” (sic) and an RS-232C D-connector. Both are reserved for “use with future upgrades,” though it doesn’t take much foresight to imagine what they might be. The TA-E9000ES’s operating software is stored in an 8-megabit flash memory that’s accessible via the RS-232C jack, so software upgrades are an obvious possibility. With new software and a test microphone, automated speaker setup—even correction of room acoustics—might be feasible. With its two Sony 32-bit fixed-point DSPs and a new Analog Devices ADSP21062 SHARC 32-bit floating-point DSP, the 9000 has the computational horsepower to do a lot of digital processing. Right now, that horsepower is dedicated to decoding Dolby Digital, DTS, and MPEG surround bit streams (the “SHARC” chip does that) and to generating more tone-control functions and soundstage processing options than many people would find use for. New software could reconfigure the 9000 to do other things. But I’m getting ahead of myself!

As it stands, the TA-E9000ES identifies and decodes whatever surround format you feed it (as well as mono or stereo MPEG, DTS, and Dolby Digital bit streams), illuminating legends in the display to show the signal format and which speakers are being used for it. For example, a 5.1-channel bit stream will turn on the “L,” “C,” “R,” “LS,” “RS,” and “L.E.E.” (low-frequency effects) legends if your setup includes speakers for them but will light only the “L,” “C,” and “R” legends (and fold surround information into the left and right front channels) if you have no surround speakers. If you have surround speakers but no center, the same signal will light up all but “C” and fold the center-channel information equally into the left and right front channels. Even if you have all five speakers, however, a digital signal containing fewer channels will cause only the legends for the speakers required to light up.

You can opt to treat two-channel digital or analog signals as stereo or process them as Dolby Pro Logic. If you treat the signal as Pro Logic and you’re using a five-speaker array, the “LS” and “RS” surround legends darken; a single “S” legend glows, indicating a monophonic surround channel.

In addition to straightforward surround decoding, the TA-E9000ES offers more DSP-enhanced cinema modes than you can shake a stick at. Since these “enhancements” are calculated with 32- rather than 24-bit precision, Sony claims that their resolution is far better than you’ll find in competitors’ equipment. Three of the DSP embellishments are based on the acoustics of several venues at Sony Pictures Entertainment (the Cary Grant Theater, the Kim Novak Theater, and the Music Scoring Stage). Others include “Night Theater” (“retains a theater-like environment while listening at low volume levels”), “Mono Movie” (“creates a theater-like environment from movies with monaural soundtracks”), and “Stereo Movie” (which does similarly for stereo soundtracks).

The TA-E9000ES has virtual surround modes to simulate the presence of more speakers than you’re using. With a single pair of surround speakers, you can simulate three sets—or five sets elevated approximately 30° above the listeners. Other modes simulate surround with only front speakers, taking the three front channels’ sound to create one or three sets of virtual surround speakers. Because Sony uses two 32-bit DSPs in parallel to create the ersatz sound fields, they can even be layered one upon another, combining the acoustics of one of Sony Pictures’ sound stages with your choice of virtual surround speakers.
All told, this preamp offers 17 DSP-enhanced cinema modes in addition to unenhanced decoding. Further, there are nine modes for straight music listening ("Small Hall," "Large Hall," "Opera House," "Jazz Club," "Disco/Club," "Church," "Live House," "Arena," and "Stadium") and one for video games. You can store customized versions of any surround field, adjusting the level of the effect and the volume in each channel and, for about half the modes, varying the ersatz room’s wall reflectivity and reverberation characteristics.

And that describes only the DSP circuits’ spatial functions. They also enable you to change tone quality in a staggering number of ways, with extremely flexible bass, midrange, and treble adjustments that work in stereo as well as all surround modes. Most A/V components’ tone controls function only in stereo mode because response alterations made prior to the matrix surround (Dolby Pro Logic) processor cause decoding errors, and altering response after the processing would require tone-control circuits for all five channels. The TA-E9000ES has independent sets of tone controls for the main channels, the center channel, and the surrounds—and Sony has gone beyond the norm in providing unusually complete control facilities.

These comprise bass and treble adjustments and a midband parametric equalizer. Each bass and treble control has shelving response and ±10 dB of adjustment in 0.5-dB steps. Each bass control’s turnover frequency can be adjusted from 99 Hz to 1 kHz in 21 steps; the treble turnover is adjustable from 1 to 10 kHz in 23 steps. In between is a parametric midrange equalizer with a choice of three bandwidths ("Wide," "Middle," and "Narrow"), a center frequency that can be adjusted in 37 steps from 198 Hz to 10 kHz, and a control range of ±10 dB in 0.5-dB increments. You can store favorite settings in the five available memories. And these settings are all stored individually for each sound field. The digital processing power this must take boggles my mind!

The TA-E9000ES’s "Digital i" volume control is even more noteworthy. Combining digital and analog techniques, it adjusts signal level by changing the parameters of the preamp’s 1-bit Current Pulse D/A converters. (It does not digitally recalculate word values or adjust volume strictly in the analog domain, both of which have technical limitations.) After dejittering, eight-times oversampling, and feedforward digital filtering, digital information for each channel is converted to 1-bit pulse streams and fed to independent Current Pulse DACs. Volume is adjusted by changing the current sources that feed the converters rather than by altering word values. The level of the current source for each DAC is controlled by a static DAC that receives information from the volume control and

from such other level-adjustment functions as balance and speaker setup. Theoretically, Sony’s "Digital i" circuit should have the excellent tracking characteristics of a digital volume control with an analog control’s superior resolution at low levels.

As to speaker setup, Sony goes well beyond the usual arrangements. Once you inform the TA-E9000ES which speakers you have and whether they are "Large" or "Small," you can set each crossover frequency in 10-Hz steps from 40 to 200 Hz, an unusually precise and flexible arrange-
ment. To adjust relative channel levels, you set left/right balance for the main and then the surround speakers, set overall level for the surround speakers, set levels for the center speaker and the subwoofer, and adjust the level of signals sent from the LFE channel to the subwoofer without affecting bass frequencies redirected to the sub from other channels. Most of these adjustments are in 0.5-dB steps, with a range from +10 to -20 dB and then to "Off" for the center speaker and the surrounds and from 0 to -20 dB for the subwoofer.

Delays are adjusted in terms of speaker-to-viewer distances, in feet (3 to 40, in 1-foot steps) or in meters (1 to 12, in 0.1-meter steps). You cannot select different delays for the left and right speakers of either the front or the surround pair; Sony assumes that you've placed the left and right speakers symmetrical to the primary viewing/listening position. Although this is not uncommon, it might be confusing for those whose home theaters are in irregularly shaped rooms. What is uncommon is that you can set the subwoofer's delay with respect to the other speakers, for a more coherent sound; you can also reverse the subwoofer's polarity, which is nice.

Even more unusual, and perhaps unique, the TA-E9000ES has settings for your surround speakers' placement ("Side," "Middle," or "Behind") and height ("Low" or "High"). These settings affect only the virtual surround modes; in other modes, the 9000 assumes that your surround speakers are "low" and "behind" you, regardless of the settings.

The supplied remote is sexy and of sufficient complexity to come with its own instruction manual. Further, it is bidirectional, sending commands to the preamp and receiving information from it. During setup, its LCD touchscreen must be taught to associate each menu's displayed legends with the screen's underlying touchpoints, which you do with a plastic pointer cleverly hidden in a slot on the remote. After that, you make selections by touching legends with a finger or, if your fingers are too large, with the pointer. You also can scroll through some menu sections with a dial at the upper right of the remote, pressing the dial to enter your command. Actual buttons are provided for muting, volume level, on/off, the sleep mode, and turning on the remote's backlight. A side roller adjusts screen contrast. Along the left of the screen are legends ("Function," "Soundfield," "List," "Sub," "Set Up," and "Reload") to call up first-level menus and download parameter settings stored in the preamp's memories. The ability to download information from the preamp comes in handy if you accidentally erase some of the remote's settings or lose them because its batteries have died. It also enables the remote to work with any software upgrades that may someday be loaded via the preamp's RS-232 port.

Using the remote is fairly straightforward. Pressing "Function" brings up a screen full of icons representing program sources. Touching one of them selects that source and then brings up a screen of operating controls for it. With another screen, you choose sound fields and adjust them. "Setup," naturally, calls up the setup menus.

The TA-E9000ES can be operated quite well from its front panel. The controls are intuitive, and their functions are explained reasonably well in the owner's manual. I'm impressed with the clarity of the front panel's display and the fact that some buttons illuminate to indicate basic settings—for example, when the equalizer is active or when you're in stereo mode. With such a well-designed panel, I sure don't miss on-screen menus. I'm also impressed with the extras that Sony has included, such as the "Audio Split" button, which...
reasonably well until I checked its D/A con-

E9000ES. The first seemed to be working

Measurements

I tested two samples of the Sony TA-

-J

Fig. 15—THD + N vs. frequency, 

Fig. 16—THD + N vs. frequency, 

Fig. 17—Frequency response, 

Fig. 14—Frequency response, 

Dolby Digital mode.

Dolby Digital mode.

Dolby Pro Logic mode.

Dolby Digital mode.

lets you play any audio source in combina-

change it at their input stages, to accommo-

Dolby Digital mode.

Dolby Pro Logic mode.

Dolby Pro Logic mode.

converter’s linearity, one of my last bench tests. Everything was fine from 0 to -80 dBFS, but the output cut out at -90 dBFS. I’d never en-
countered this before, and I repeated the test several times to be sure I wasn’t making a mistake. Even stranger, the 9000 didn’t cut out at -90 dBFS when it was fed analog signals and digitized them internally. Only when fed a digital bit stream, dithered or undithered, did it become confused.

When the second sample ar-

arrived, I began with the linearity test and found no problem at all. In fact, the converters in the second sample were among the most linear I’ve ever measured! I started the full test series over again, but it soon became apparent that there was little difference between the samples when I used analog signals, save for slightly lower distortion on the second. Therefore, I decided to use the first sample’s results for tone-control response, bass-management response, input and output impedance, and record output levels. All other results are from the second sample.

Figure 1 shows frequency re-

sponse of the TA-E9000ES via its 
analog line input and the phono input’s RIAA equalization error (which amounts to the same thing as frequency response); the anti-
aliasing filters ahead of the A/D converters limit treble response to 23 kHz. Note how flat the response is! Even with this very sensitive level scale, you can hardly see any filter ripple in the curve taken at the line input (which includes the effects of the anti-aliasing filter before the input A/D converter and the reconstruction filter after the output D/A converter). Phono equalization is notably accurate from 20 Hz to 20 kHz, too. There’s a 0.2-dB mismatch in output level between the channels; the mismatch was the same at the line and phono inputs and wasn’t present when I used a digital input, so I expect it’s caused by a mismatch in A/D converter gain. No big deal, but there’s no way to correct it.

Noise was quite good for line or phono signals, as demonstrated by the A-weighted noise results listed in “Measured Data” and the third-octave noise spectra in Fig. 2. Note the absence of power-line-related hum and how benign the noise is; it’s prac-
tically “white,” i.e., its energy rises at 3 dB/octave (10 dB/decade). Of course, the RIAA equalizer modifies the noise character-
istic of the phono preamp, but it’s still remarkably benign in the TA-E9000ES.

Except for the slight yet needless channel imbalance, I’m impressed with the Sony’s line preamp. Not only was its input imped-
ance higher than typical (without affecting noise), but there was also an adequate safety margin before A/D converter overload.

Like many digital preamps, the TA-

9000ES has switchable gain. But the Sony’s “Output Low” setting, which re-
duced gain by 15 dB, didn’t affect input overload. That’s rather odd. Although digi-
tal preamps often let you select gain, they

THE DIGITAL PROCESSING POWER IN THE SONY’S TONE CONTROLS ALONE BOGGLES MY MIND.
### STEREO MODE

**Output at Clipping (1% THD at 1 kHz):** 9.39 V.

**Maximum Voltage Gain:** 14.4 dB.

**THD + N at 2 V Output, 20 Hz to 20 kHz:** With 80-kHz measurement bandwidth, less than 0.0255%; with 22-kHz bandwidth, less than 0.0159%.

**Output Impedance:** 200 ohms.

**Frequency Response, Tone Controls at “0”:** 20 Hz to 20 kHz, +0, −0.19 dB; −3 dB below 10 Hz and at 23.15 kHz.

**Tone-Control Range:** Bass, ±9.7 dB at 1 kHz; treble, ±9.8 dB at 10 kHz.

**Subwoofer Crossover Points:** High-pass, at 180 Hz; low-pass, at 420 Hz.

**Nominal Crossover Slope:** High-pass, 6 dB/octave; low-pass, 12 dB/octave.

**RIAA Equalization Error:** 20 Hz to 20 kHz, +0.06, −0.04 dB.

**DOLBY DIGITAL (AC-3) MODE**

**Channel Balance:** +0.06, −0.04 dB.

**Frequency Response:** Main, center, and surround channels, 21 Hz to 20 kHz, +0.03, −0.13 dB; low-frequency effect channel, 20 to 120 Hz, +0, −0.62 dB.

**THD + N for 0-dBFS Signal:** Main, center, and surround channels, 0.0073% or less at 1 kHz; LFE channel, 0.0041% at 30 Hz.

**THD + N at −10 dBFS, 20 Hz to 20 kHz:** Main, center, and surround channels, 0.0135% or less.

**Channel Separation:** 73.2 dB or greater, 100 Hz to 1 kHz.

### DOLBY PRO LOGIC MODE

**Output at Clipping:** 9.38 V or higher for main, center, and surround channels at 1 kHz.

**THD + N at 2 V Output:** Main and center channels, less than 0.0141%, 100 Hz to 20 kHz; surround channels, less than 0.0139%, 100 Hz to 7 kHz.

**Frequency Response:** Main channels, 100 Hz to 20 kHz, +0.16, −0.02 dB (−3 dB below 10 Hz and at 23.3 kHz); center channel, “Large” speaker setting, 100 Hz to 20 kHz, +0, −0.12 dB (−3 dB below 10 Hz and at 23.08 kHz); center channel, “Small” speaker setting, 84 Hz to 23.08 kHz, +0, −3 dB; surround channels, below 10 Hz to 7 kHz, +0, −3 dB.

**A-Weighted Noise:** Main channels, −85.8 dBV; center channel, −89.7 dBV; surround channels, −86.7 dBV.

**Channel Separation at 1 kHz:** 46.5 dB or greater.

### D/A CONVERTER SECTION

**Frequency Response:** 20 Hz to 20 kHz, ±0.02 dB.

**THD + N at 0 dBFS, 20 Hz to 20 kHz:** Less than 0.0058%.

**THD + N at 1 kHz:** Below −85.1 dBFS from 0 to −90 dBFS and below −92.6 dBFS from −30 to −90 dBFS.

**A-Weighted Noise:** Main channels, −85.8 dBV; center channel, −89.7 dBV; surround channels, −86.7 dBV.

**Channel Separation at 1 kHz:** 46.5 dB or greater.

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**Maximum Linearity Error:** Undithered signal, 0.95 dB from 0 to −90 dBFS; dithered signal, 0.4 dB from −70 to −100 dBFS.

**S/N:** A-weighted, 96.3 dB; CCIR-weighted, 87.1 dB.

**Quantization Noise:** −86.8 dBFS.

**Dynamic Range:** Unweighted, 92.2 dB; CCIR-weighted, 85.2 dB.

**Channel Separation:** Greater than 73.2 dB or greater.

**INPUT IMPEDANCE:** Line input, 100 kilohms; MM phono input, 49.7 kilohms.

**Muting:** Total.

**A-Weighted Noise:** Line input, −86.4 dBV; MM phono input, −79.8 dBV.

**Input Impedance:** Line input, 100 kilohms; MM phono input, 49.7 kilohms plus 180 pF.

**Input Overload (1% THD at 1 kHz):** Line input, 3.1 V; MM phono input, 59.9 mV.

**Channel Separation:** Greater than 72.7 dB, 100 Hz to 1 kHz.

**Channel Balance:** ±0.11 dB.

**Recording Output Level:** Line input, 490 mV for 0.5 V out; MM phono input, 255 mV for 5 mV out at 1 kHz.

**Recording Output Impedance:** 1.03 kilohms.

**A/DA CONVERTER SECTION**

**Frequency Response:** 20 Hz to 20 kHz, ±0.02 dB.

**THD + N at 0 dBFS, 20 Hz to 20 kHz:** Less than 0.0058%.

**THD + N at 1 kHz:** Below −85.1 dBFS from 0 to −90 dBFS and below −92.6 dBFS from −30 to −90 dBFS.

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**Recording Output Impedance:** 1.03 kilohms.
management schemes of varying complexity, depending on the "level" of the product. The 9000 shoots for the highest level and attains it, though I still would have preferred sharper filters.

Let's turn now to the D/A converter. As you can see in Fig. 7, the second sample I tested did not cut out on low-level digital signals. With a dithered signal, there is no linearity error at all for the left channel and the error for the right is only 0.4 dB at -100 dBFS. The fade-to-noise ratio (Fig. 8) also suggests better-than-usual linearity. Frequency response (Fig. 9) is ruler-flat and free of filter ripple (even though the scale I used for relative level is 0.1 dB/division, far more sensitive than usual). And note that the channel imbalance I had found at the analog inputs is essentially absent. (The "mismatch" of ±0.015 dB is within the limits of measurement error.)

Figure 10 shows THD + N versus level for the DACs. Any converter whose THD + N drops 6 dB below -90 dBFS is okay in my book. In Fig. 11 are third-octave spectrum analyses of the output when the DACs are fed a "silent" digital bit stream and a 1-kHz digital signal at -60 dBFS. The curves are free of power-line-related components (as were the noise spectra taken using the analog input), but there's no evidence of the noise shaping usually seen with delta-sigma converters. (Noise shaping sharply increases noise energy at frequencies above the audio band because it shifts in-band quantization noise into that region.) On the other hand, the Sony's noise energy rises smoothly and has white-noise characteristics to 70 kHz, then rolls off. This noise spectrum is, effectively, quite similar to the thermal noise of an analog circuit—indeed, I can't be sure that what we're seeing isn't the thermal noise of the output amplifier rather than the quantization noise of the DAC! Perhaps because Sony used no noise shaping, the S/N results in "Measured Data," though respectable, are below average. The results for dynamic range and quantization noise (which I consider far more important) are more typical of current DACs but certainly do not establish any new record.

Figure 12 compares the stereo crosstalk characteristics for the analog and digital inputs. Although channel separation is better via a digital input (as is to be expected), the difference between the analog and digital inputs is so small that it certainly will not be noticed. On the whole, channel separation is even better in Dolby Digital (AC-3) mode than in stereo, as reflected in the best and worst Dolby Digital channel pairings (Fig. 13). Crosstalk was best between the left surround and center channels, where separation was greater than 88.2 dB out to 10 kHz. It was worst between the left surround and right front channels, but even here, minimum separation (73.2 dB) was about the same as it was in stereo operation.

Balance among the three front and two surround channels in Dolby Digital mode was excellent, which testifies to the accuracy of Sony's "Digital i" volume control and level-adjusting system. The differences in the channels' frequency responses (with "Large" speaker settings used all around) were negligible. Figure 14 contains the "best" and "worst" response curves for Dolby Digital mode; they are virtually identical, even on this extremely sensitive level scale. Sony's filters and converters are really flat!
with digital recording capability and three with optical and coaxial interfaces)—to say nothing of its video processor loop and internal AC-3 RF demodulator—mark the 9000 as one of the most versatile A/V pre-amps on the market. With S-video connectors doubling every composite-video jack, it imposes fewer constraints on video interfacing than most other products. The only thing missing is a component-video bus, but few current products are so advanced as to provide one.

The touchscreen-activated remote provides full control and is easy to use. It does seem to have a healthy appetite for batteries, and the backlighting and screen contrast could be greatly improved, but I had little difficulty operating it when I could see what I was doing. The menus are intuitive, and most of the touchpads are big enough to be operated reliably with a finger—with mine, at least. Two-way communication enables the remote’s memory to be refreshed when necessary (when a program source is added or changed and control codes need to be reloaded, for example). When used with some Sony products, such as CD players that have a disc memory, the remote also can display disc and song titles.

All of this is very nice, but what really sets the TA-E9000ES apart from the crowd are its multiple 32-bit DSPs, 8-megabyte flash memory, and that cryptic RS-232C port on the back. Sony is officially silent about its plans for the port (a spokesperson stated that “Sony doesn’t like to promise something before it’s ready to deliver”). But I wouldn’t be surprised if the first sample’s loss of output on low-level digital signals were a fluke in software code, since I can’t come up with a ready hardware explanation. If that proved to be the case, my sample could have been “repaired” simply by downloading a new instruction set. Whether that supposition proves correct or not, the RS-232C port raises the possibility of upgrading—even of “redesigning”—the TA-E9000ES in the future. Right now, for example, two of the 32-bit DSPs are devoted to sound-field processing while the SHARC chip handles Dolby Digital, DTS, and MPEG decoding. No offense meant, but how likely is it that MPEG decoding is far from a sure thing. Freeing that memory and computational power for other purposes would enable the 9000 to perform a variety of other tasks. What those might be is a matter of speculation.

Lots more horsepower (and memory-occupying instructions) are currently used to generate the TA-E9000ES’s fantastically versatile tone controls. Some people may neither need nor want such versatility. To be honest, the “Narrow” setting of the parametric equalizer has such high Q that it’s unusable as a normal tone control, but if you’re into generating weird effects, you might like to play with it. The high-Q setting is also likely to require the most computation, so forgoing it might allow Sony to include one or more other functions that are far more valuable. (I’d be happy to trade it for sharper crossover filters.)

One could even sacrifice some of Sony’s sound-field effects, although I must say that they’re among the better ones I’ve heard—far less obvious and gross than usual. Eliminating a few of them—perhaps the layered ones—would free up huge amounts of horsepower for other purposes. Now, I’m not saying this is what will be done or even that it’s what should be done; I’m simply saying that it could be done. I can envision a day when you have your Sony TA-E9000ES and I have mine, each customized to our own needs. I can envision a day when we change our minds and “redesign” our systems via the Internet. I can even envision third-party software, but that’s getting pretty far out there. For this versatility, I’m willing to accept DACs that, although decent and arguably indistinguishable from the best in a home theater application, are not up to the high standards that Sony has demonstrated in the past.

In short, the TA-E9000ES is an outstanding and exceptionally flexible A/V preamp/processor that holds out the promise of becoming even more so in the future.
9B ST

Hearing is Believing... Feel the Emotions

Bryston’s 9B ST delivers extraordinary quality to your entire home theatre surround sound experience.

Feel the emotions: be shocked, be happy, feel sad, scared out of your wits, surprised, be moved, be excited, feel like you want to cry with joy. The Bryston 9B ST amplifier will awaken all of your emotions in a simple elegant package designed to provide 5 channels of uncompromised sound quality.

Tel 1-800-632-8217 Fax 705-742-0882 www.bryston.ca
The Cobalt 820 is the top model in JMlab's seven-speaker Cobalt series. But it's not the top speaker in the company's total line, which includes 27 speakers that range up to the Grand Utopia at $70,000 per pair. The last loudspeaker from this French company that I reviewed, the Spectral 913.1 (Audio, November 1995), performed notably well.

JMlab is named for Jacques Mahul, its founder and current president. Previously chief engineer and head of R&D of another French speaker company, Audax, he founded both JMlab and Focal in 1980. Focal, which manufactures the raw drivers used by JMlab, also supplies more than 50 speaker manufacturers worldwide (including, in the United States, Avalon Acoustics, Legacy Audio, Snell Acoustics, Thiel, Westlake Audio, and Wilson Audio Specialties). JMlab/Focal is France's largest speaker maker.

The Cobalt 820 is a three-way, front-ported vented-box design. Its drivers are arrayed vertically, with two 7-inch woofers below a 1-inch inverted-dome tweeter and a 5-inch midrange on top. Just below the bottom woofer is a generously flared port tube, 2½ inches in diameter and 21 inches long. The 820's slim cabinet is only 8½ inches wide but, at about 40 inches, is fairly tall. The grille frame, solidly made of half-inch medium-density fiberboard (MDF), plugs into the front panel.

The cones of the 820's long-excursion woofers are made of a material that JMlab calls Polyglass, a combination of cellulose and a synthetic material called Neoflex to make it strong and light, coated with hollow glass microspheres in a resin binder. (The granular coating feels like a very fine grade of sandpaper.) A rubber surround attaches the cone to a cast metal frame. The voice coil is about 1½ inches in diameter and is wound on an aluminum former; it is powered by a large ferrite magnet, ¾ inch thick and 4 inches in diameter.

This speaker's midrange driver is much like its woofers, even using an identical magnet. Its cone is variously described in the JMlab catalog as the same Polyglass found in the woofers and as Neoglass (with no explanation of the discrepancy); like the woofers, it is attached by a rubber surround. Instead of a dust cap, however, the midrange has a stationary, bullet-shaped phase plug at the center of the cone. The voice coil, 1 inch in diameter, is wound on a

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**Rated Frequency Response:** 40 Hz to 23 kHz, ±3 dB.

**Rated Sensitivity:** 91 dB at 1 meter, 2.83 V rms applied.

**Rated Impedance:** 8 ohms, nominal; 3 ohms, minimum.

**Rated Power Handling:** 200 watts.

**Dimensions:** 40⅜ in. H x 8⅞ in. W x 12¼ in. D (102.5 cm x 22 cm x 31.2 cm).

**Weight:** 51.9 lbs. (23.6 kg) each.

**Price:** $2,500 per pair; available in natural, red cherry, or black cherry wood veneers.

**Company Address:** c/o Audio Plus Services, P.O. Box 3047, Plattsburgh, N.Y. 12901; 800/663-9352; www.audioplusservices.com.

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**EQUIPMENT PROFILE**

D. B. KEELE, JR.

**JMlab COBALT 820 SPEAKER**
The tweeter, made of titanium with a thin coating of titanium dioxide (which JMlab calls Tioxid), is suspended by a large flat foam surround; the voice coil's diameter is about ¼ inch. In front of the tweeter dome, on a plastic brace, is something that JMlab variously calls a phase plug and an "acoustical impedance control device"; it is a small cone, about ¾ inch in diameter and ¼ inch deep, whose point is aimed at the diaphragm's center. The Cobalt series catalog does not say what this structure is for, but other companies use similar devices to flatten their tweeters' on-axis response and broaden response off-axis. I consider it much too small to affect the response—after all, ¾ inch is only about a quarter of a wavelength at 16 kHz!—but I'd have had to break it off to measure the tweeter's performance without it.

Because the company supplied a pair of Cobalt SR 20 surround speakers ($700 per pair) and a Cobalt CC 20 center channel ($600), I checked them out briefly. A similar Tioxid tweeter is used in the CC 20 and SR 20 but with a slightly larger phase plug than in the 820. In the CC 20, the tweeter is flanked by two 6½-inch woofers; the SR 20, a front-radiating speaker, uses the Tioxid tweeter with a 6½-inch woofer. Both systems have sealed enclosures.

The Cobalt 820's cabinet, of ¾-inch MDF, is made more solid by a front-to-rear brace just above the top woofer, by a side-to-side brace behind the bottom woofer, and by the midrange's enclosure tube. JMlab provides spikes for the bottom of the cabinet, metal footer discs to protect hardwood floors from the spikes' points, and stick-on foam discs that can be used instead of the spikes. The company also offers an optional base, whose heavy weight and large footprint greatly increase the cabinet's stability.

The 820's crossover contains 15 components that make up a second-order (12-dB/octave) filter for the parallel-connected woofers, a bandpass filter (consisting of a second-order high-pass in cascade with a third-order, 12-dB/octave, low-pass) driving the midrange, and a third-order high-pass filter for the tweeter. All inductors have ferrite cores. Connections to the Cobalt 820's drivers and input terminal cup are soldered. The terminals themselves are gold-plated, five-way binding posts, arranged in dual pairs to facilitate bi-wiring but connected together with gold-plated straps for normal cabling.

Measurements

Figures 1A, 1B, and 1C show, respectively, on-axis anechoic frequency response of the JMlab Cobalt 820, Cobalt CC 20, and Cobalt SR 200. (These measurements were taken 2 meters from each cabinet front, for the 820 at a level halfway between the midrange and tweeter, and smoothed with a tenth-octave filter. All curves are based on elevated free-field measurements, combined with ground-plane measurements in the 820's case.)

Except for a low-frequency bump at 100 Hz, the Cobalt 820's response with the grille off is quite smooth and flat and fits a tight, 3.5-dB, window from 49 Hz to 20 kHz. Below 35 Hz, the response rolls off at 24 dB/octave. Above 3 kHz, the nominal crossover from the midrange to the tweeter, the response shelves off by about 2 dB. (Beyond 20 kHz, the tweeter's output underwent a series of peaks and dips, indicating the presence of several ultrasonic dome resonances; a 91.7-dB peak at 20.3 kHz was fol-
allowed by a dip to 71.8 dB at 22.9 kHz, then another peak of 93.2 dB at 25.9 kHz. Above that frequency, response dropped fast, falling to 78 dB at 30 kHz, the highest frequency I measured.) The 820's grille causes fairly significant response variations above 2.5 kHz, where maximum deviations range from +2.5 to -4 dB.

As the Cobalt CC 20 center channel and SR 20 surround speakers weren't officially part of this review, I measured only their on-axis frequency responses. The CC 20's response (Fig. 1B) is very uniform and, except for a bass rolloff that starts earlier, at 90 Hz, is a very close match for the 820's. It should make an admirable companion to a pair of 820s in a home theater, where matched timbre in the three front channels is extremely important. The SR 20's response (Fig. 1C), though not as smooth as either the 820's or the CC 20's, still fits a fairly tight, 5-dB, window from 90 Hz to 20 kHz. Its level is about 2.5 dB lower than the other speakers', however.

To check the phasing between the Cobalt 820's woofers and midrange, I reversed the woofers' connections via the bi-wire terminals, which caused a deep reduction in output in the two octaves centered near the 400-Hz nominal crossover frequency. This demonstrates that the woofers and midrange are solidly in phase through their crossover region when these drivers are connected normally, an ideal condition that minimizes lobing and maintains proper directional characteristics at crossover. The fact that the speaker's output was reduced over a wide, two-octave, band when I reversed the connections indicates that the drivers' responses overlap significantly at crossover. This would have been a problem if the drivers were significantly out of phase when normally connected; fortunately, they were not. For the record, the Cobalt 820's sensitivity, averaged from 250 Hz to 4 kHz, was 89.4 dB.

Below 15 kHz, the right and left speakers matched closely, within ±1 dB. At higher frequencies, one tweeter's output rose above its mate's, the difference reaching 3.5 dB at 20 kHz. The disparity in treble output is probably due to the dome resonances above 20 kHz, which are hard to control.

Figure 2 shows the 820's phase and group-delay responses, referenced to the tweeter's arrival. A direct-radiator speaker's phase curve commonly slopes down, as seen here, because its midrange's output follows its tweeter's. In the 820, the drop is smooth until about 5 kHz, in the tweeter's band, where it levels out at about -640°. By averaging the group delay between 700 Hz and 2.5 kHz, I calculated that the midrange lag was approximately 0.33 millisecond.

The 820's horizontal on- and off-axis responses are shown in Fig. 3. In the primary listening window, within ±15° of the axis, the response is extremely uniform all the way to 20 kHz. Even 35° off axis, it is essentially flat to 12.5 kHz. All curves are quite uniform.

The Cobalt 820's vertical on- and off-axis responses (Fig. 4) are also very uniform in the ±15° listening window. The symmetry between the above- and below-axis responses through the upper crossover region (3 kHz) indicate ideal phasing between the midrange and tweeter. Comparing Figs. 3 and 4, we see that the high-frequency response above 6 kHz is as uniform and even above and below axis as it is to either side.

The Cobalt 820's impedance (Fig. 5A) varies widely, from lows of 2.9 ohms at 125 Hz and 2.6 ohms at 2.1 kHz up to 14.7 ohms at 58 Hz and 15.7 ohms at about 18 Hz. The dip at 35 Hz shows the approximate point of the vented enclosure's tuning frequency. Based on these impedance extremes, keeping cable series resistance to no more than about 0.037 ohm should ensure that peaks and dips caused by cable effects will be no larger than 0.1 dB; for a run of 10 feet, this corresponds to 12-gauge (or heavier), low-inductance cable.

The 820's impedance phase (Fig. 5B) varies from -61.3° at 70 Hz to +43° at 3.6
kHz, near the upper crossover. These phase extremes, coupled with the 820's low impedance minimums, indicate that the JMlab will be a fairly difficult load for most amps and that it should not be driven in parallel with other speaker systems.

Driving the Cobalt 820 with a high-level sine-wave sweep caused very little wall vibration (though there was some minor vibration of the top and sides at 400 Hz), a sign that the cabinet is quite rigid. The woofers had a healthy maximum excursion of about ¾ inch, peak to peak, and overloaded quite gracefully. (There was, however, significant dynamic offset with sine-wave signals of more than 10 volts rms between 70 and 110 Hz.) The woofers’ excursion reached its minimum at 39 Hz, close to the 820’s vented-box resonance. The vent did its job quite well, reducing cone excursion at this frequency by a significant two-thirds, which I measured by closing the vent temporarily to check the speaker’s performance without it.

For Fig. 6, raw and smoothed 3-meter room response, I placed the 820 in the right-hand stereo position and aimed it at the test microphone, which was at ear height (36 inches) at the listening position. Above 200 Hz, the smoothed curve fits a fairly tight window of 12 dB; above 800 Hz, it fits a much tighter, 6-dB, window.

I analyzed the Cobalt 820's harmonic distortion at 41.2 Hz (E₁), 110 Hz (A₂), and 440 Hz (A₄) for input power levels up to 100 watts (28.3 volts rms into the rated 8-ohm load). At 41.2 Hz (Fig. 7), the second harmonic is highest (about 13%) at 20 watts and relatively low (8.4%) at full power. The third harmonic again reaches its maximum, a significant 25%, at 20 watts but rises no further. This is because the woofers exhibit significant dynamic offset at the 110-Hz fundamental with inputs of 20 watts or more. This offset, an outward cone displacement, rounds off one side of the acoustical waveform coming from the cone, and the resultant asymmetry raises the level of the second harmonic. The third harmonic has an intermediate peak (about 3.5%, this time at about 12.5, not 20, watts) and then drops and rises again (to 2.5% at full power).

At 440 Hz (Fig. 9), the third is by far the dominant harmonic. Again, distortion jumps at about 20 watts, staying below my analyzer’s measurement floor at lower power levels before the third and fifth harmonics pop up out of the background. Although the Cobalt 820 sounded quite harsh when reproducing the 440-Hz tone at 100 watts, the culprit this time was saturation of the 3.5-millihenry iron-core inductor in the woofer crossover, not dynamic offset. Saturation causes symmetrical distortion, increasing the odd, rather than the even, harmonics.

When the 820 is fed an equal mixture of 440-Hz (A₄) and 41.2-Hz (E₁) tones at power levels from 0.1 to 100 watts, its intermodulation distortion rises smoothly to a quite audible 9.1% at 100 watts (Fig. 10). Both the woofers and the midrange radiated significant amounts of the higher, 440-Hz, tone during this test, probably because all of these drivers are active at frequencies close to their crossover.

Figure 11 shows the short-term, peak-power input and output of the Cobalt 820, measured using a 6.5-cycle shaped tone burst. As the 820’s nominal impedance is 8 ohms, power levels were calculated by assuming that the measured peak voltages were applied across an 8-ohm resistor. At 20 Hz, the maximum input power is only

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**SYMPHONIC MUSIC BENEFITED FROM THE COBALT 820s' SMOOTH AND WIDE DISPERSION.**

**Figure 11**

With a 110-Hz signal (Fig. 8), the second harmonic again reaches its maximum, a significant 25%, at 20 watts but rises no further. This is because the woofers exhibit significant dynamic offset at the 110-Hz fundamental with inputs of 20 watts or more. This offset, an outward cone displacement, rounds off one side of the acoustical waveform coming from the cone, and the resultant asymmetry raises the level of the second harmonic. The third harmonic has an intermediate peak (about 3.5%, this time at about 12.5, not 20, watts) and then drops and rises again (to 2.5% at full power).

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10 watts. It rises rapidly to a peak of 300 watts at 50 Hz, dips to 110 watts at 350 Hz, rebounds to 1,480 watts at 1.5 kHz, falls again to 860 watts at 2.6 kHz, and finally rises to 3,600 watts above 6 kHz. The first part of the dip between 80 and 700 Hz is caused by the woofers' dynamic offset, which limits the 820's acoustic output. The rest of this dip, and the dip between 2 and 4 kHz, are caused by saturation in the speaker's crossovers. When I bypassed the lower crossover and fed my amp directly to the woofers, the permissible input power rose significantly, as illustrated. At 400 and 500 Hz, the input power rose from 120 watts up to 900 watts, a very significant 9 dB!

With room gain, the Cobalt 820’s peak acoustic output is weak (84 dB) at 20 Hz, but then rises rapidly to a plateau of about 117 dB between 55 and 90 Hz. After falling significantly, to 110 dB at 400 Hz, the maximum output rises again, staying at about 120 dB from about 1 to 3.2 kHz and then rising to a loud 124 dB above 5.5 kHz.

Use and Listening Tests

The JMlab Cobalt 820s weigh 52 pounds each, which made them very easy to unpack and position. One speaker of the pair sustained some shipping damage, arriving with a corner of the cabinet bashed in, but it worked just fine. The Cobalt 820s were supplied in natural cherry, the CC 20 center speaker in a darker red cherry, and the SR 20 surround speakers in redburn lacquer (a finish available only on the center and surround speakers). All three finishes were very attractive, but I liked the red cherry best. The front panels of the 820s and the CC 20 were finished in semigloss black lacquer and looked quite good even with the grilles off (which was how I did most of my listening). All surfaces of the surrounds were finished in redburn and were quite good-looking. The cabinetry and workmanship on all three models were first-rate. The JMlab speakers have separate manuals for stereo listening and home theater. Both manuals describe the company's entire line, not just the Cobalt series. The stereo listening manual covers just about every area of setup and operation, including room acoustics, placement, accessories, cabling, and amplifiers. The equally detailed home theater manual covers subwoofers, surrounds, and center-channel speakers extensively.

I did most of my listening to the Cobalt 820s in my regular stereo setup. I positioned them as I do most speakers, about 2 feet from the side walls and 3 feet from the wall behind them. I canted them in toward me and used single wiring (facilitated by the 820's very accessible rear terminals). My other equipment included a Krell KRC preamp, a Crown Macro Reference power amp, an Onkyo CD player, Straight Wire cabling, and, as in most of my previous reviews, B&W 801 Matrix Series 3s for comparison.

On The Dixie Chicks’ smash country CD Wide Open Spaces (Monument 68195), the Cobalt 820s performed commendably, with overall balance and tonality quite close to the B&Ws'. Vocals were clean and clear at moderate to loud levels, although the JMlab speakers slightly emphasized sibilants and were brighter than the B&Ws'. Despite that brightness, the 820's treble characteristics were well balanced with its low end. Vocals did sound slightly strained at very loud concert levels, but I rarely use such levels for normal listening. The JMlabs' bass kick nearly equaled the B&Ws'.

The Cobalt 820 speakers were more sensitive than the 801s, so I attenuated their input signal by about 4 to 5 dB to match levels. In other words, the B&W speakers require two-and-a-half to three times more amplifier power than the JMlabs, a significant difference.

The Cobalt 820s could be played loud and cleanly on rock, pop, and jazz that did not have much content below 40 Hz. On pipe organ and other music that did have high energy below 40 Hz, they came out second best to the B&Ws (most speakers do). But even with organ music, the 820s' low-frequency overload was minimal and their sound was still fairly clean at high levels. Though these JMlab speakers did not deliver the very lowest wall-shaking bass notes, they still made a good account of themselves.

Symphonic music profited greatly from the 820's smooth and wide dispersion. Imaging and center-channel stability were outstanding. The 820s were also very well suited to re-creating chamber music, including its small-room ambience. In fact, they performed quite well on most everything I played.

After my initial round of listening tests and measurements, I set up an additional listening session to see if I could hear the effects of crossover inductor saturation on music, closely comparing the JMlabs' sound to the B&Ws' at high volume levels. On normal wideband music recordings, both speakers sounded equally clean, and I really couldn’t hear much difference between them until I raised the volume to extreme concert levels. When played super
When I moved the JMlab speakers to my home theater, they did not let me down. I was impressed by the way sounds retained their tonal character when panned between the 820s and the CC 20 center speaker. The SR 20 surrounds performed up to my high expectations and beyond. And the sensitivity of all three models helped them reproduce loud special effects well.

The JMlab Cobalt 820, Cobalt CC 20, and Cobalt SR 20 proved to be excellent all-around performers. They are good looking, well built, and—compared to other high-end speakers—reasonably priced. Go out and hear them for yourself.

On third-octave band-limited noise, the Cobalt 820s produced no usable output below the 32-Hz band yet had quite good output at 40 Hz, though I could detect significant port noise in those bands. At 63 Hz and above, the JMlab 820s mostly equaled the B&W 801s' performance except for the noticeable dynamic offset in the bands from 80 through 125 Hz and the sudden harshness at very high levels in the bands from 250 to 400 Hz, which was caused by inductor saturation.

The JMlab Cobalt 820s passed both my pink-noise tests with flying colors. On the stand-up/sit-down test, I heard hardly any change in the upper midrange when I stood up. Pink-noise response was also quite good: There was some high-frequency emphasis, although the tonal differences from band to band were less than on the pair of B&W 801s.

Cobalt CC 20 center-channel speaker (left) and Cobalt SR 20 surround speaker (bottom).

Cobalt CC 20 center-channel speaker (left) and Cobalt SR 20 surround speaker (bottom).

Cobalt CC 20 center-channel speaker (left) and Cobalt SR 20 surround speaker (bottom).

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The Meridian 557 is a strictly analog component from a company best known for advanced digital technology. Founded some 20 years ago as Boothroyd/Stuart, Meridian owes much of its fame to its introduction of the first “high-end” CD player, improving upon a technology promoted as already “perfect.” Since then, the company has produced a singular line of DSP-enhanced active loudspeakers and the Meridian Lossless Packing system, which was recently adopted for data “squeezing” in the new DVD-Audio standard.

The 557 power amplifier exemplifies other aspects of Meridian—think: It is thoroughly engineered, employs some fresh circuit ideas, and is beautifully constructed and finished. You can’t say the 557 is inexpensive, but it is fairly priced by esoteric audio standards. This particular power amp, a third-generation model (though it isn’t designated “Mk. III”), embodies many circuit changes that set it apart from its identically named predecessors.

The Meridian 557’s front panel bears only a single, green power LED. Besides balanced XLR and unbalanced RCA inputs, the rear panel carries two paralleled pairs of output binding posts per channel to facilitate bi-wiring. The posts are U.S.-friendly, with holes and ¼-inch spacing to accept single or dual banana plugs; they are also of unusually nice, all-metal construction with fully removable nuts and large-diameter wiring holes. A power switch, an IEC AC socket with integral line fuse, and a screwdriver-activated bridging switch are also on the rear panel. There is no DC-trigger terminal for auto on/off switching; Meridian recommends leaving the 557 switched on unless it’s not being used for an extended period. (Idle consumption is specified as 30 volt-amperes.)

Physically, the 557 is fairly imposing: It’s a nearly 60-pound rectangular solid of quite high-quality metalwork that includes handsome heat-sink castings as well as heavy-gauge sheet-steel rear and bottom panels. The front panel looks to be a solid half-inch aluminum billet (it’s actually an extrusion about ¼ inch thick overall, with solidity-enhancing ribs and anti-resonant padding along its open inner surfaces), while the top is the black-glass plate (which shows fingerprints with relentless clarity) that’s become a signature of Meridian’s components.

Under the hood, the 557’s arrangement appears quite traditional. Each channel is served by a separate board, nestled against the heat sink, that contains the input, voltage-gain, and output circuitry; all but the output stages appear to be discrete-transistor/IC hybrids. Both boards are supplied by separate three-lead windings from a massive toroidal transformer; each board carries 20,000 microfarads of storage capacitance. Each channel employs four bipolar pairs of Motorola NPN and PNP
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output transistors, nominally rated to deliver 100 audio-frequency watts per pair with a very generous safe-operating area (1 amp at 100 volts for 1 second). The 557's internal metalwork looks about as meticulous as the external hardware, and the wiring is top-grade—professionally soldered and using premium cables (such as the heavy van den Hul links that feed the speaker outputs). First-class p.c. boards with plated-through holes are employed. Parts quality appears high throughout the amp, as does construction detail.

Meridian says the third-generation 557 has a "super-balanced" input stage (which even balances signals at the unbalanced jacks) that has near-perfect impedance symmetry. The amp's physical layout and lead dress were carefully laid out in mirror symmetry to preserve full audio quality in bridged mode.

The output stages use a variation of the "error-corrected" topology proposed in 1984 by noted British audio thinker and pedagog Malcolm Hawkesford. In this design, highly localized negative feedback in the output stage maintains very low output impedance over a wide operating band. A Meridian engineer characterized its operating mode as "almost idealized Class B," adding that it achieves very low quiescent current draw (about 1 milliamper) despite all devices being turned on at all times. The power supply includes bifilar transformer windings, which are said to enhance rail stiffness, and custom-made Samwah storage caps. Protection consists of output stage overexcursion and thermal sensors that simply clamp the outputs under dangerous conditions, as well as a conventional line fuse.

Measurements

Following my usual practice, I completed my listening before putting the Meridian under the microscope. My bench-test results were pretty close to faultless by most standards of modern amplifier performance. (Except as indicated, I made all measurements via the 557's unbalanced RCA inputs.)

I powered the amp from an ordinary household AC circuit. As a result, line voltage sagged by 4 to 5 volts when I drove both the Meridian's channels into clipping while driving 4-ohm loads. This is a fairly common phenomenon, and the 557 still easily passed its specified power hurdles. I suspect that perhaps 5% more power might be on tap if I had a stiffer AC source (such as the development-lab supplies on which many amp manufacturers derive power specs). But for most of us, typical domestic wiring will have to suffice. Unless you routinely clip your amps while listening to organ music, it shouldn't matter.

In stereo, the Meridian 557 delivered around 220 watts per channel at its clipping point into 8-ohm loads and 350 watts at 4 ohms. When bridged for single-channel output, the 557 produced 710 watts into 8 ohms and something in excess of 1 kilowatt into 4 ohms. (I cannot configure a 4-ohm resistive load to handle more than 1 kilowatt and was reluctant to risk melting my expensive power resistor.) Meridian specifies bridged power at 4 ohms, but its instructions for mono connection refer to "a loudspeaker of 6 to 15 ohms."

Frequency response was very flat in all modes (note the expanded vertical scale in Fig. 1). The results shown for 1-watt output and an 8-ohm resistive load were essentially unchanged with 4-ohm loads, in bridged mode, and at various other power levels. The curve for left-channel response into a speaker load (a typical small, sealed-box two-way loudspeaker) is a near image of the resistive-load curves—so near, in fact, that I had to lower it by 0.25 dB so you could see it. This extreme similarity, which augurs well for consistent performance with a
I tested total harmonic distortion plus noise (THD + N) versus frequency at rated power—200 watts in stereo and 650 watts bridged into 8 ohms (Fig. 2A) and 300 watts into 4 ohms (Fig. 2B)—and at 1 watt. The results are in no way unexpected, except perhaps for the relatively higher distortion in bridged mode at low frequencies with 8-ohm loading. (This topped out at about 0.3%—still negligible—at 15 Hz.) I suspect that has more to do with the bridging input circuitry than with the Meridian 557's amplification.

When plotting THD + N versus power output (Fig. 3), it's customary to show distortion at 20 Hz, 1 kHz, and 20 kHz. However, the Meridian's distortion at all lower frequencies was effectively identical to the 1-kHz results, so I have plotted distortion for 1, 10, and 20 kHz. Both channels were exercised for this test and yielded virtually identical results, so I am showing only the left channel's. The results for 8-ohm loading (Fig. 3A) exhibit the usual slight increase in distortion as frequency and power rise, but THD + N remains very low right up to the clipping point of around 225 watts at all frequencies. Nothing significant, other than the clipping point, changes with 4-ohm loading (Fig. 3B) or bridged operation into an 8-ohm load (Fig. 3C).

I found IHF dynamic headroom to be around 1 dB for 8-ohm and bridged operation and a slightly more significant 1.3 dB for 4-ohm stereo use. Note, however, that the 557's clipping headroom (power at clipping divided by rated power) is itself approximately 0.5 dB, so true dynamic headroom (short-term headroom above steady-state clipping) is actually pretty negligible.

In all, the 557 is one of the best-behaved high-power amplifiers I've seen. It's worth noting that it achieved these fine results with about 115 volts from the AC line at full power and that it did not once buzz, spark, shut down (except when deliberately shorted by a screwdriver), emit dangerous aromas, or otherwise exhibit displeasure. It didn't even get particularly hot. (An hour running at one-third power made its surfaces quite warm but not uncomfortably hot.)

A noise spectrum at 1 watt out into 8 ohms (Fig. 4) confirms that the 557 meets or surpasses Meridian's noise rating of −90 dB (noise in bridged mode does rise a bit higher than that, but only above 20 kHz). Bridged-mode noise is 6 dB higher than in stereo mode, which is pretty normal for the sort of active-input balanced design used in this amp. The more dramatic increase in 60- and 120-Hz hum with bridged operation is less immediately explicable; it, and the 300-Hz peak I take to be associated with it, could be inherent in the amplifier, but they stand an almost equal chance of being ground gremlins in my test setup. (I did try all the usual grounding and cabling permutations to eliminate them.) Either way, though, the balanced connection's common-mode rejection should substantially outweigh even noise of this magnitude in environments where induced noise is a potential problem. But, as I've found more than once, ordinary unbalanced wiring could well be the better choice in many homes.

Channel separation at 1 watt out was at least 75 dB at all audio frequencies, which is very fine. The Meridian's A-weighted S/N ratio, around 90 dB (83 dB balanced), was several decibels short of the best power amps I've measured but 6 dB or so better than merely average ones. More important
fully bi-wired to the 557's dual pairs of binding posts using Wireworld cables. The Solos are small but usually capable, with solid output down to about 40 Hz and—usefully for amplifier evaluations—relatively low sensitivity (about 85 dB at 1 meter for a 1-watt input).

Meridian’s amplifier powered this stripped-down setup with just about total mastery. Dynamic contrasts were fully involving, yet treble delicacy and bass authority were both absolutely top-shelf. Reference Recordings’ latest serving of ultra-brass music from Frederick Fennell, Marches I’ve Missed (RR-85 HDCD), sounded terrific. The combination of big bass drum and superbly recorded cymbal work is a stern test for any system, particularly one with a small, vented speaker. The 557 passed that test easily. The trio sections of these marches typically combine a steady tuba “oomp-pah” sound with bass drum and up-beat cymbals. The “Hall of Fame” march on track 12 is a typical example, demanding plenty of power and tight speaker control to produce a natural, unwavering playback without floppy drum sound or smeared cymbals. The Meridian supplied that power and control with ease.

The 557 had ample power for these highly dynamic recordings, and it kept the small Platinums under strict control, free from bass bloat or ringing. It also produced sumptuously detailed sound from a wide variety of CDs. I’ve recently been spending time (too much!) renewing my acquaintance with Shostakovich’s monumental string quartet cycle, as played by the Eder String Quartet. (The six volumes on Naxos are available at a great price and carry quite lovely recordings made in a Budapest church.) The hypnotic opening of the 15th quartet’s Serenade (Naxos 8.550976) requires both extreme delicacy and substantial dynamic range. It sounded dramatically alive and naturally etched, with a rich sense of space and depth, especially when played back in an absolutely silent room. The Meridian contributed absolutely no audible noise—electrical or mechanical. Hearing this system reinforced my belief that there’s no real substitute for large amounts of high-quality power, even for music programs as dynamically “modest” (hah!) as string quartets.

Lyle Lovett’s I Love Everybody (MCAD-10808) has some terrific tracks, including an outstandingly up-front and snappy trap drum on “Penguins” that sounded satisfyingly punchy and believable through the 557. With the Meridian at work, stand-up bass—on such cuts as “La to the Left”—carried natural weight, and the extremely natural vocal recording and very fine detail shined through over the entire album.

This latest version of Meridian’s 557 delivered the transparency and nuance I’m accustomed to hearing from top-flight systems while providing more than enough power reserve for my studio’s 2,500+ cubic feet. When I deliberately clipped the amp on high-level rock, its sound first hardened a bit and then grew harsh at about the expected rate, which is to say, comparatively quickly. But I could not get the 557 to reach this point, even with the decidedly low-sensitivity Solos, under any sort of normal listening. And short of such deliberate clipping, I was entirely unable to hear any particular characteristic that could be attributed to the Meridian. I believe, in short, this is a very fine amplifier and one that is finely made.
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NCT Audio Products, Inc. One Dock Street, Suite #300, Stamford, CT 06902
The Churchill's external crossover is finished to match the main enclosure.

I've long known and respected Tannoy's Dual Concentric two-way coaxial speakers. Every model I've heard has delivered easy, natural, and musical sound with realistic dynamics. But I'd never had one in my home system until I auditioned the Churchill, currently the top model in Tannoy's North American line.

The Churchill is a formidable, distinctive, and quite beautiful hunk of speaker, weighing in at 180 pounds (plus 35 pounds for its external crossover) and priced at $14,000 per pair. The enclosure is designed to minimize internal standing waves: Its trapezoidal shape minimizes lateral reflections, while vertical reflections are minimized by the V-shaped port's duct, which bisects the cabinet's interior. Every enclosure is handcrafted to traditional fine furniture standards from hardwoods and has Gaboon ebony edging.

A removable panel on the back enables you to tune the Churchill's bass by adding lead shot or by adding or removing batts of open-cell foam, neither of which I tried. Tannoy says adding shot will make the bass sound a bit more solid by enhancing the enclosure's coupling to the floor and by making the cabinet even less likely to resonate. The company also says that removing one or two of the four foam batts in the cabinet will slightly raise the enclosure's tuning frequency, giving you more energy between 30 and 50 Hz but less below 30 Hz.
In Tannoy's Dual Concentric driver, the tweeter uses the woofer's throat and its curved cone as a hyperbolic horn.

(Anyone who wants to extend the bass lower at the expense of output between 30 and 50 Hz can get additional batts from TGI, Tannoy's distributor.)

The Churchill's 15-inch driver is an updated version of the Dual Concentric drivers Tannoy has been using since 1947. In the Dual Concentric design, a horn tweeter's magnetic system and diaphragm are behind the woofer's voice coil and magnet structure. The tweeter's horn begins as a flared waveguide in the woofer's pole piece and is continued by the hyperbolic curve of the rigid woofer cone. The horn, together with the design of the crossover, is said to produce a coherent spherical acoustic wavefront. The voice coil of the Churchill's tweeter is immersed in a cooling magnetic liquid (presumably Ferrofluid), the woofer has a large edge-wound voice coil (2 inches in diameter), and the driver's frame is a very rigid casting.

The Churchill's crossover is specified at 1 kHz and uses a fourth-order low-pass filter and a second-order high-pass. It's in a separate cabinet, for isolation from microphonic effects caused by sound-pressure variations within the speaker enclosure. The crossover's Solen Hepta-Litz inductors are arranged in a magnetic-null orientation for minimum interaction. Matched Solen capacitors and Dale precision resistors are also used. Dual WBT input connectors enable bi-wiring from your power amplifiers to the crossover input. A shielded multi-conductor Kimber Kable connects the crossover to the speaker via a large Neutrik twist-lock, high-current connector. The connector's size and the cable's length let you place the crossover 6 to 14 inches from the speaker; if the crossover is near the speaker, any excess cable will slide into the crossover's cabinet.

I placed the Churchills well out in my listening room, a position I'd found good for Dunlavy SC-III and B&W 801 Matrix Series 3 speakers. It was immediately obvious that the Tannys had a very neutral, honest sound and that they presented the dynamics of music in a more realistic and palpable way than those other speakers. I was struck with how big and powerful the sound was. Bass quality and extension were the best I have experienced from speakers far out in the room, even though I was using a pair of 9-watt amplifiers (experimental single-ended amps, with 300B output tubes, designed by Mike Sanders of Quicksilver Audio). But then, the Churchills are unusually sensitive speakers, rated at 95 dB SPL (anechoic, not half-space) at 1 meter for a 2.83-volt input. (I have since had great success using these speakers with other amplifiers: the Manley Labs Stingray and E.A.R. V20 integrated stereo tube amplifiers, the single-ended DeHavilland Electric Company Aries mono and Wyetech Topaz 211A stereo tube power amps, Quicksilver Audio Silver 60 and M135 mono push-pull tube power amps, a Sumo Polaris solid-state stereo power amp, and an Arnoux 7B digital switching amplifier.)

The Tannoy Churchills did not have as wide and well-defined a soundstage as the Dunlavy SC-IIIIs, but they imaged nicely in my setup. Their tonal balance was quite good, and the slightly excessive mid-bass I sometimes hear in my room was absent. Somehow, high frequencies were easier to hear yet weren't overly bright. Clarity and delineation of detail were quite thrilling. In fact, the Churchills' clarity and resolution make them excellent tools for hearing differences in other components of the listening chain. Some of my friends could hear a small horn "honk" near 1 kHz, the crossover frequency, but I can't really say that I heard it—at most, I could imagine I heard it if I listened really hard.

I augmented my listening impressions with some measurements. The Churchills' step response, as captured by an MLLSA system, indicated that the tweeter and woofer were in phase but that the tweeter's signal arrived about 270 microseconds before the woofer's, whether the test was made 1 or 2 meters away from the speaker. The Churchill's quasi-anechoic frequency response was reasonably smooth and extended well past 20 kHz.

Tannoy's literature states that the Churchill is "impedance compensated," with special networks in the crossover making the speaker's impedance phase and amplitude fairly constant with frequency, like a resistor's. However, Tannoy provides this compensation only in the middle and upper frequencies (my testing confirmed this). From 200 Hz up, this 8-ohm speaker's impedance stayed between 5.6 and 8.8 ohms, which is quite reasonable, but in the bass it varied from 4.5 ohms at 131 Hz to 21 ohms at the enclosure peak, 45 Hz. The 45-Hz peak, says Tannoy, "helps tube amps—especially single-ended designs—come to life." (The Churchill's impedance phase was about -53° at 53 Hz but stayed within ±20° from 80 Hz to 20 kHz.) According to Tannoy, a flat midband and high-frequency impedance characteristic is also very helpful to tube amps, which are quite sensitive to impedance variations there. (This is borne out when I use a dummy speaker load to test tube amplifiers' frequency responses.) Impedance variations give solid-state amps no problem in terms of frequency response.

I was quite impressed with the Churchills and truly enjoyed my time with them. If they're a bit too rich for your blood, my favorable impressions of other Tannoy loudspeakers lead me to recommend that you check out some of the company's less-expensive systems.
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SURGEON GENERAL’S WARNING: Cigarette Smoke Contains Carbon Monoxide.
Adcom's GCD-750 is priced at $1,250—affordable, but a step up from the many moderately priced ($300 to $700) CD players that sound really good. The GCD-750 is also a step up in performance, giving you good high-end sound that falls short of the ultra-high end by a surprisingly small margin. Although its price is serious money, this player takes you seriously into the music, revealing the best recordings' finest details with only a minimum of digital hardening.

The GCD-750's useful features include a large LCD screen (though it's hard to read off axis), front-panel LED indicators (for power, digital lock, and HDCD), and a remote that can also control an Adcom preamp. There are balanced and unbalanced analog outputs and a coaxial digital input so that you can use the 750 as a D/A converter for other sources. Its unusually rugged transport incorporates a high-quality three-beam laser assembly (one beam to read data from the CD, two side beams to maintain tracking accuracy), cradled in a heavy steel chassis for stability and shock protection.

Digital data is passed, via a Pacific Microsonics 20-bit HDCD filter, to two differential pairs of Burr-Brown 1702 premium 20-bit DACs, which Adcom says sound better than even some 24-bit DACs. Each DAC has its own locally regulated power supply to maintain channel matching; all told, the GCD-750 has seven regulated power supplies.

The audio section of a CD player is as important as its digital and DAC sections, and the GCD-750's draws on the work of Nelson Pass and Adcom's experience with its GFP-750 preamp and GFA-5802 power amp. (In fact, that amp and preamp and this player make one hell of a combination.) The 750's analog stage is Class-A and follows Pass's minimalist philosophy of keeping circuit paths as simple as possible for quick reactions to transients and accurate reproduction of low-level signals. Adcom uses very fast discrete MOS-FET devices here and says that this enables dithering to be "tuned...[to] smooth out harshness without losing essential detail."

Although that last claim sounds a bit like the advertising copy for a filter cigarette, the GCD-750 is a lot smoother and sweeter than most of its competition and has very good warmth and depth. It isn't tube-like, but it does very well indeed in making natural recordings come alive. With this player, you can tell why so many audiophiles fall in love with Mercury Living Presence CDs and high-quality CD remasterings of Reiner's Chicago Symphony recordings. With thinner-sounding players or those having a shallow and more two-dimensional soundstage, the reasons for this passion can be a real mystery.

The GCD-750 was equally good at revealing the virtues of good new recordings, of course. The sound of HDCD recordings was among the best I've heard from moderately
priced CD players. The 750 conveyed the sonic advantages of Telarc's and Chesky's best recordings, the quality of the hall sounds and ambience in Dorian CDs, and the benefits of Classic Records' and Mobile Fidelity's very fine remastering.

The GCD-750's overall timbre may seem slightly soft or forgiving until you realize you're still hearing musical detail but not the touch of upper-octave hardness and glare that's all too common among competing CD players. Top-octave transparency was exceptional for a unit in this price range. Midrange and upper-octave detail was not smoothed away to make the sound more forgiving. Bass was very good, detailed, and extended—another test of a good CD player.

The GCD-750's dynamics and transients were very good and musically lifelike, if not up to those of state-of-the-art players. Dynamic contrasts were musically natural, with a slight mid-hall perspective that was far more listenable than the more aggressive dynamics of many other players.

The Adcom's mix of timbre and dynamics resulted in very natural reproduction of instruments and of male and female voices, with unusually good preservation of midrange warmth. There was none of the percussive hardness I hear from many CD players on loud piano and harpsichord passages, nor was there any tendency to harden the sounds of stringed instruments or tenor or soprano voices—a trait particularly obnoxious with closely miked recordings. The GCD-750 simply sounded musical.

It still takes top bucks to get top quality. But the Adcom GCD-750 does deliver true high-end sound and gives you excellent value for the money. It faces competition in the under-$2,000 price range, but don't let any dealer tell you that you must pay more just to get high-end sound. Many players selling for $2,000 or more don't sound better; a surprising number sound worse.

THE TIMBRE MAY SOUND SOFT AND FORGIVING—UNTIL YOU REALIZE HOW MUCH MUSICAL DETAIL YOU CAN HEAR.

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Visit your nearest M&K dealer for a complete demonstration. Who knows? One day you might even be one of our strongest references.
Dunlavy Audio Labs’ SC-Vs will likely attract two types of audiophiles: those who can afford to pay $14,995 for a pair of speakers and those who are interested in the finest equipment while dreaming of someday being able to afford it. I have good news for both. Potential buyers will find that the SC-V has few competitors under $20,000. And those who are put off by price will find much of the same voicing—save for the SC-V’s awesome deep bass—in Dunlavy’s less expensive speakers. During a visit to the company’s plant, where I heard A/B comparisons of those other models, I found that most of my impressions about the SC-Vs (if you make allowances for price differences and a few sonic subtleties) apply to Dunlavy speakers costing as little as $3,995 a pair. And that’s a pretty affordable dream.

Few speakers come close to delivering the Dunlavy SC-V’s tight, deep, room-moving bass. Its timbre is excellent, as are its dynamics and transient performance. This is a truly clean and transparent speaker, and it approaches the holographic imaging and depth of the best small monitors. Aside from cost, the SC-V’s main drawback is that it is big. It is nicely styled and finished for a large, rectangular box, though no amount of styling can disguise the fact that it is 75½ inches tall, 27 inches deep, and 15 inches wide. Because this speaker weighs 330 pounds, including its detachable wood base, it takes a bit of manhandling to position. Yet you do need massive speakers if you want the kind of true deep bass that you can get only from large sealed enclosures. And the SC-V’s heft—together with its construction of laminated, veneered fiberboard (ranging from ¾ inch to 2 inches thick)—superbly minimizes cabinet vibrations at all frequencies. This is particularly important in a speaker that can deliver massive power below 25 Hz. Sound-absorbing material is used on all relevant surfaces, to minimize diffraction. I never found the Dunlavy SC-Vs vibrating or coloring any part of the frequency spectrum, even at the highest listening levels.

The SC-V reflects the design values of John Dunlavy, whose background is in aerospace and electronics and who is highly respected for his innovations in audio and antenna design. Dunlavy stresses the importance of applying engineering theory to speaker design and verifying the success of a design through measurement. Here, he has placed the SC-V’s seven drivers (two 12-inch woofers, two 6½-inch mid-bass drivers, two 3-inch midranges, and one 1-inch fabric-dome tweeter) so
as to preserve their phase alignment, reduce room boundary effects, and maintain sharp stereo imaging. The boundary-effect reduction stems from a vertically symmetrical driver array that simulates a point source at reasonable listening distances. Dunlavy believes that this configuration usually provides the best and smoothest sound coupling to a typical room. And it avoids lobing, thus reducing the amount of sound reflected from the floor between the loudspeaker and the listener. The SC-V’s driver array is also horizontally symmetrical so that the stereo image will not skew or blur.

Dunlavy does not use radical driver designs, because he finds that ribbons and most electrostats do not measure or perform as well as cones and domes. He also believes that diaphragms made of ceramics or exotic metals store energy because they lack internal damping and thus are subject to ringing and phase distortion that can degrade impulse response. I don’t agree with all of Dunlavy’s views, because I have listened to outstanding speakers whose drivers violate his principles. Nevertheless, his driver choices enabled the SC-V to provide some of the best sound I have yet heard.

I was likewise impressed by Dunlavy Audio Labs’ exceptional quality control. The company has three anechoic chambers, including a small one used for measuring each driver to make sure it meets or exceeds its specs. Every speaker system is tested in a larger chamber, after which the company may tune each crossover (always a first-order, phase-coherent design) and fine-tune the driver selection. (The anechoic test data for every system is kept on permanent file.) For these reasons, Dunlavy can confidently specify frequency response with a tolerance of ±1 dB for all its speakers.

It’s therefore not surprising that the SC-V’s rated frequency response looks more like a preamp’s than a speaker’s: ±1 dB from 25 Hz to 22 kHz and −1.5 dB at 20 Hz, measured at realistic listening distances of 7¼ to 20 feet. Its impedance, nominally 4 ohms, ranges from a minimum of 3 ohms to a maximum of 6 ohms, and rated sensitivity is 91 dB (though the SC-V sounded more efficient to me than many speakers with the same specification). Dunlavy recommends at least 100 watts of amplifier power per channel to get the best dynamics from this speaker, but I found a 70-watt tube amplifier could drive it very well indeed.

Only a few speaker manufacturers have the courage to provide performance curves for anything other than on-axis frequency response, and they usually measure that at ideal distances and using low signal levels. Dunlavy, however, provides test results to back up its claims that the SC-V has “extremely flat amplitude and phase response, incredibly low distortion, true phase coherency, simulated point-source radiation, inaudible cabinet diffraction, symmetrical radiation patterns, broad vertical/horizontal dispersion, and precise pair matching.” All of these tests and their purpose are fully described on the Dunlavy Audio Labs Web page.

The Dunlavy SC-V is simultaneously one of the most accurate and one of the most musical speakers ever made. I spent two months relistening to my collection of CDs as well as to the new 24-bit/96-kHz recordings from Chesky and Classic Records. The SC-Vs provided as much—and as musically right—detail as I have heard from any speakers. Their cone and dome drivers revealed as much musical detail as the best ribbon drivers I’ve auditioned. I could clearly hear the subtle differences between different pressings of the same record and between original and remastered versions of CDs, not to mention the differences between 24-bit/96-kHz and 16-bit/44.1-kHz versions of the same recordings. These are very revealing speakers.

The SC-Vs had very smooth overall frequency response, and their timbre was consistent at every volume level. They had much more dynamic life than most large speakers, with a touch of the energy and excitement I normally associate with horn speakers. This made them exceptionally good at handling rapid dynamic contrasts and transients, and there was no tendency to compress the music at any level. My only reservation about timbre is that any high-end speaker that is flat beyond 20 kHz at the listening position can be a bit merciless in revealing minor signal defects. With the SC-V, there was none of the hardness I’ve heard from some speakers, but its flat upper-octave response was not romantic or forgiving.

The SC-V’s bass was stunning, more or less tied for the title of best bass I’ve ever heard with the VMPS Super Tower III Special Ribbon Edition (which I reviewed in the August 1998 issue). The Dunlavy reproduced tons of bass below 30 Hz, down into the region where you feel it more than hear it. Even though the standing waves in my room prevented me from fully exploring the lower limits of the SC-V’s response, the ultra-low bass I could hear was powerful and extremely clean.

This speaker did extremely well with the incredibly deep bass on Jean Guillou’s performance of Mussorgsky’s Pictures at an Exhibition (Dorian DOR-99117) and on other organ recordings. It had outstanding transient performance on percussion, including bass-drum spectaculars like the opening passages of “Fanfare for the Common Man” on Aaron Copland’s The Music of America (Telarc CD-80339). You owe it to yourself to listen to this speaker to hear how tight and deep bass can go and how clean it can be. I was particularly impressed by the SC-V’s ability to handle the very deep bass on tracks 1 and 8 of Jennifer Warnes’ The Hunter (Private Music 01005-82089) without thickening or adding any coloration to her voice. The SC-V also provided the most natural reproduction I have heard of Ray Brown’s bass viol trio on SuperBass (Telarc CD-83393), preserving all of the soundstage detail and ambience and the lower-midrange dynamics.

The SC-V’s superb bass response would not matter much if the Dunlavy were not equally good in every other area. Place it carefully (as called for in its owner’s manual), sit at least 7 feet away, and the output from its drivers will blend seamlessly into an almost point-source sound. Like the Thiel CS7.2, the SC-V demonstrates that large speakers can provide all the focus and soundstage detail of the best small monitors but with none of their limitations in frequency response and dynamics.
Angling the SC-Vs to get that soundstage took some experimentation, despite Dunlavy’s excellent instructions and the additional setup information on its Web site. I got best results by placing the speakers fairly far apart on the long wall of my room and toeing them in toward me.

No top-quality speaker can deliver its best soundstage over a wide area, yet the SC-V's soundstage was wide enough to let me and two others hear the Dunlavys at their best. This speaker was musical from virtually any listening position. And minor changes in listening position and head movements had no impact on imaging or on the mix of upper-octave energy.

The SC-V's ability to present the best soundstage from recordings of virtually any type, from solo guitar to opera, was impressive. You can get more detail only from a few ribbon speakers—but that detail might actually stem from a touch of ringing in the ribbon. This speaker's string and woodwind tone and definition were excellent, and it reproduced all the details of female voice quite naturally. I often use Judy Collins' recordings—it really doesn't seem to matter which one—to hear how a speaker deals with breathing and “shh” sounds. Some speakers make her aspirates hard, some soften them, but the SC-V got them right.

The Dunlavy SC-V reproduced the midrange and upper octaves of solo violin and piano accurately. Its exceptionally clean upper-octave harmonics came through quite clearly on flute, solo violin, the upper register of the piano, cymbals, and the full range of brush and snare-drum sounds.

I disagree with John Dunlavy on one point, which bears only indirectly on his speakers. He feels very strongly that most high-end interconnects and cables use “smoke and mirrors” technology and do not deliver on their promises. He has made his own wires, based on what he feels are well-defined engineering principles, and they are quite good—though not, to my mind, as good as the SC-Vs. At the risk of seeming to prefer magic, I am using some very good interconnects and cables from AudioQuest, Discovery, and Wireworld, and I found that several of them had better midrange and upper-octave clarity and sweetness with my electronics than the Dunlavy cables did. I also kept coming back to the Kimber Select speaker cables and interconnects I now use as a primary reference. They provided me with the smoothest midrange and upper octaves I could get from the SC-Vs, and they have superb definition. The Kimber Selects also rivaled the Wireworld products for the best bass. They did not have quite the overall bass power of the Dunlavy interconnects and speaker cables, but they had better definition and seemed to go slightly lower.

Despite the SC-V's price and despite my listening room's standing-wave problems, which keep me from getting all the deep bass the Dunlavy could produce, I was so impressed that I have bought them to use as additional reference speakers. They can be driven by virtually any good stereo amp (or pair of mono amps), they are exceptionally efficient and dynamic, and they are both stunning and musical. But what I said at the beginning of this review bears repeating: Other speakers from Dunlavy Audio Labs have many of the SC-V's virtues, at lower prices, making audiophile dreams much more affordable.
Perhaps the best way to begin reviewing this historical Gustav Mahler compendium is to state that it deserves to be nominated as album of the year. This follow-up to the New York Philharmonic’s highly successful first limited edition, The Historic Broadcasts, 1923-1987, is a 12-disc all-Mahler set that contains performances by some of the most distinguished players of the last half-century, a veritable cornucopia of musical treasures. That two important Mahler conductors are missing can be ascribed to Mahler himself never having been involved in a broadcast and to Leonard Bernstein’s available Mahler performances with the New York Philharmonic and other orchestras being on other labels. But look at what this box, with its six two-disc jewel cases, does contain!

The catalyst for my own Mahler enthusiasm happened to be the first performance featured here, which marked the return in 1959 of John Barbirolli, as guest, to the New York Philharmonic after 16 years. I attended both the Friday and Saturday performances and then listened to the Sunday broadcast. I was hooked, both by the work and by Barbirolli’s atmospheric, characterful, and vivid conducting. But there was also frustration, for I never was able to find a copy of that notable broadcast. Were the price tag for this $225 box only for that one performance, I would still be tempted to buy it.

It is not so easy to single out other favorites. The 1964 “Songs of a Wayfarer” with Dietrich Fischer-Dieskau and William Steinberg, which follows the First Symphony, is not only a fine performance but also, with the inclusion of two of its songs later appropriated by Mahler for that symphony, a clever bit of program sequencing. Another superb Barbirolli item is his Ninth, which is just a little more personal and passionate than the conductor’s recording with the Berlin Philharmonic. Each conductor—Pierre Boulez in the Third, Klaus Tennstedt in the Fifth, Dimitri Mitropoulos in the Sixth, Rafael Kubelik in the Seventh, Leopold Stokowski in the eighth, and Bruno Walter and the notable singing by Kathleen Ferrier in “Das Lied von der Erde”—in his own way presents his individual views of the composer’s architectural structures, weltanschauung, resignation, sarcasms, and ecstatic visions as well as his own way of eliciting the sheer, overwhelming power of Mahler’s music. All are among the best one can hear. Of course, several of these conductors (notably Boulez, Tennstedt, and Kubelik) made subsequent commercial recordings of this repertoire, all sonically more up-to-date. But these broadcasts are the ones that most effectively convey the sense of occasion.

Disappointments? In contrast to other “Resurrection” Symphony recordings, Zubin Mehta’s No. 2, for all its erupting graves and apocalyptic noises, seems bent on superficial effects; one wishes his performance had more breadth as well as less glaring brasses. Georg Solti’s No. 4, with lovely singing from Irmingard Seefried in the finale, appears less enthralling than some other versions, it nonetheless is welcome for its lack of hypertension.

The first half-hour of the final two-disc album is devoted to gripping performances by Mitropoulos of the Ernst Krenek version of just two movements from the unfinished 10th Symphony (prior to Deryck Cooke’s...
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The playing of the Philharmonic is always grandly breathtaking, and the expert transfers from the various sound sources by Seth Winner are nothing short of admirable. The later performances, such as those in stereo (Nos. 2, 3, 5, and 7) are the ones, naturally, that come off best. But barring a few less satisfactory cases, everything here is listenable. Constriction may be heard in such massed passages as Stokowski's No. 8 of 1950, and some occasional graininess might be noticed in the 1962 taping of Solti's No. 4. The retention of audience noises in between movements also helps to communicate the atmosphere and setting of the original broadcasts.

Not least of what makes this New York Philharmonic package so attractive is its inclusion of two superb booklets, each 246 pages. The first, "Mahler in New York," contains an amazing collection of articles, lists of all the Mahler performances by the New York Philharmonic and of the composer's own programs from his seasons directing the orchestra, essays on Mahler and his predecessor, reviews of Mahler's conducting and music, reproductions of his marked scores, a list of the orchestra's management and benefactors, comments by contemporary players of the orchestra about their Mahler performances, and features by and about Walter and Bernstein. "The Mahler Broadcasts," the second booklet, contains all the original Philharmonic program notes, reviews of the performances, full texts and translations, biographies of the participants, the membership roster of all those New York Philharmonic players who participated in the broadcasts, and producer Sedgwick Clark's astute appraisal of all that one hears in this extraordinary set. The booklets are copiously illustrated, beautifully printed, and in many cases include color, such as those pages taken from annotated musical scores.

Altogether, this is an absolutely stunning production and deserves the greatest praise. (For phone orders, call 800/557-8268; the Web site is: www.newyorkphilharmoni.org.)

Igor Kipnis

Sweet Stay Awhile: Songs and Lute Pieces by John Dowland
Charles Daniels, tenor; David Miller, lute
EMI CLASSICS CDZ 72266 22, 63:49

John Dowland (1563-1626) composed some 80 songs with lute accompaniment. Though these are often transcribed for classical guitar or even piano, their delicate beauty is best displayed on their original instrument. David Miller shows what a lute can do in skillful hands, and baroque expert Charles Daniels' clear, penetrating tones perfectly match Dowland's succinct masterpieces. From the quiet charm of "I Saw My Lady Weep" to the strange chromatic harmonies of "Thou Mighte God, That Rightest Every Wrong," the duo interprets the music with deftness and sensitivity.

Patrick Kavanaugh

Not content to simply play guitar transcriptions of classical masterworks, the Los Angeles Guitar Quartet, like the Kronos Quartet—the string quartet that has revolutionized classical presentation and repertoire—looks to contemporary music and global cultures for its material. On this album, that means willful eclecticism. There are suites of African pieces, South American melodies, and klezmer tunes. The quartet plays jazz pianist Chick Corea's Rodrigo-inspired "Spain," a piece by classical composer Peter Maxwell Davies, and music for Japanese shakuhachi. The Los Angeles Guitar Quartet puts staples on its guitar strings to imitate the African mbira and uses paper clips and foil to help make the instruments resonate like a Balinese gamelan. Though it does sound fascinating and is all beautifully played and recorded, I wish the group had dug in a little deeper. The South American panpipe tunes, in particular, are facile. This quartet is best heard on the African cross-picking of "Djeme," LAGQ guitarist Andrew York's "Passage," and Dusun Bogdanovic's poignant "Mysterious Habitats," played by John Dearman.

John Diliberto
When Hank Mobley stepped into Rudy Van Gelder's recording studio in March 1955 to record his first sides as a leader for Blue Note, he already had differentiated himself from the pack. Unlike the style of tenor titans Sonny Rollins, John Coltrane, and many others, Mobley's was not as overtly aggressive. He took a less dramatic approach—more conversational, with a beautiful, lilting sound and a spinning lyricism rather than sheets of sound. His easy manner of delivery, however, nearly masked his abundant creativity. Amid the excitement of early 1950s hard bop, Mobley was a busy sideman with Max Roach, Dizzy Gillespie, Horace Silver, Kenny Dorham, and Julius Watkins.

Nine original albums, including two never before released and four titles that had never been reissued in the United States, are represented on The Complete Blue Note Hank Mobley Fifties Sessions. Eight rambunctious quartet tracks open the proceedings, an appropriate introduction to the fine talent heard on these six discs. The next five tunes showcase an unusual front line of tenor plus two trumpeters, Donald Byrd and Lee Morgan. Vibraphonist Milt Jackson is showcased on the next five bluesy jaunts.

By March 1957, Mobley was exploring the typical bop quintet setting, featuring trumpeter Art Farmer. Septets follow, enlisting stylized altoists John Jenkins and Shafi Hadi and trumpeters Byrd and Bill Hardman. The remaining sessions are quintets, with influential trumpeters Dorham, Farmer, and Morgan.

In his ongoing mission as jazz's Everyman, whether funk fire-starter with the re-formed Headhunters or urbane interpreter on his own or other artists' albums, Herbie Hancock is always reinventing himself and the music he plays. On Gershwin's World, he integrates 14 Gershwin classics into something like a Broadway show album. The cast is impressive, the choice of tunes exemplary. However, the performances more often resemble a set of smoking one-offs than a unified master suite. "Cotton Tail" is a tempestuous jazz improvisation, earth-scorched clean by drummer Terri Lyne Carrington and saxophonist Wayne Shorter (who is in exceptional form throughout). Joni Mitchell's smoky, knowing renditions of "Summer-Time" and "The Man I Love" are sublime, as is the Chick Corea/Hancock stride workout, "Blueberry Rhyme."

From the down-home surreal splendor of "Here Comes de Honey Man" and "St. Louis Blues" (with Stevie Wonder on vocals and harmonica) to the fully symphonic "Lullaby" and a beautiful experimental version of Prelude in C-Sharp Minor (with Kathleen Battle and percussionist Cyro Baptista), Gershwin's World aims high. That its pleasures are in the individual slices—not in the whole pie—doesn't spoil the taste treat.

Ken Micallef
Mobley's all-star rhythm sections epitomize the era's musical wealth. They include pianists Horace Silver, Sonny Clark, and Wynton Kelly; bassists Doug Watkins, Wilbur Ware, and Paul Chambers; and drummers Art Blakey, Philly Joe Jones, and Art Taylor.

I can’t stress enough how creative Mobley was and how fluent his compositions were; 40 of the 56 tracks here (including many alternates) are his. His arrangements are polished and first-rate, and most of the performances can easily be described as jubilant, imaginative, and spontaneous.

Although Mobley was underappreciated in his lifetime (see the annual jazz polls), he and his various ensembles are now lauded for being at the apex of 1950s hard bop, the era that continues to form the basis of today's straight-ahead jazz. And Mosaic's outstanding, well-annotated overview of these recordings should help burnish Mobley's legacy. (Available direct from Mosaic Records, 35 Melrose Place, Stamford, Conn. 06902; phone, 203/327-7111; fax, 203/323-3526; mosrec@ix.netcom.com.)

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Wander This World
Jonny Lang
A&M VLT 31454-0984, 52:55
Sound: A-, Performance: B+

Perhaps this album should've been called I'm a Big Boy Now, or Mannish Boy, or even Heere's Jonny. But let's not dwell on the trivial. Jonny Lang, who's still being hailed as a hotshot blues prodigy, shows the spark of a mature and authentic blues player on Wander This World, his second major-label album.

Lang's talent is undeniable. And on this latest effort, he bends guitar strings with forceful authority and sings with the eloquence and soulfulness of a Stax/Volt legend. True, Wander This World is a slick and contemporary, almost watered-down '90s take on the blues—a blend of R&B, soul, and classic rock. Nonetheless, Lang reveals a bluesman's heart and soul (even if his biggest worry in life is finding a prom date). Listen closely to "Angel of Mercy," a traditional 12-bar blues, which awakens his talent like nothing else.

Mike Bieber

Quality Time
Bob Mintzer Quartet
TVT JAZZ 3230, 59:52
Sound: A-, Performance: B+

As the sole horn player for the popular Yellowjackets quartet, saxophonist Bob Mintzer has, by any jazz standards, a high-profile gig. Although he may not get quite the same attention when his own quartet blows into town, the music on Quality Time is essentially from the same groove bag. Mintzer mines a vein of very catchy, very earthy tunes, most of which have enough depth to appease the hard-core, hard-bop fan.

It's obvious that jazz means more to Mintzer than a walking bass line with high-hat. In the opening title track, he juxtaposes unlikely elements, as a funk groove propels a medium waltz. The finger-popping results are catchy indeed. And in Mintzer's vision, funk does not require electronics. Rather, his rhythm section is stacked with strictly acoustic musicians: bassist Jay Anderson, pianist Phil Markowitz, and drummer Peter Erskine—extremely fine, very funky players in their own right.

That's just one side of the coin, however. By the sixth track, "Bop Boy," Mintzer is playing serious saxophone on more traditional blues. "Bop Boy" itself is an up-tempo piece. Its opening statement is a blistering duet of tenor saxophone and drums, and then the piano and bass enter while Mintzer navigates the basic changes in sophisticated fashion. It's interesting to hear what the crème de la crème is doing with the most basic chordal structures these days.

Creativity abounds on Quality Time. And as long as players like these continue to congregate, jazz will move into the next decade with ample representation and options to spare.

James Rozzi

Trio Fascination, Edition One
Joe Lovano
BLUE NOTE 7243 8 33114, 66:02
Sound: B, Performance: A

As a media-friendly star who's not in his 20s, Joe Lovano is a rarity in jazz. Though he commands his saxophones with all the passion of youth, it is the experience and wisdom of his 48 years that have made him one of the most acclaimed musicians in contemporary jazz. From the experimental groups of Bill Frisell and Paul Motian to the romantic inventions of his own Celebrating Sinatra, Lovano's grasp of modern music is masterful. Trio Fascination finds him improvising with two of the genre's deepest intellects, drummer Elvin Jones and bassist Dave Holland. In these luxurious surroundings Lovano excels. "4 on the Floor" recalls a classic Impulse blowing session, "Ghost of a Chance" is a breathy, Coleman Hawkinsish rumination on lost love, and "Studio Rivbea" is a hipster's...
Taj Mahal's life's work is a celebration of African-American roots music, from country and "big city" electric blues to folk, country blues, and (particularly later in his career) other pan-African music (such as calypso and reggae). Even Appalachian music hasn't been overlooked by Mahal, whose toolbox is filled with banjo and various other instruments of rural America.

In Progress & In Motion, a three-disc retrospective from Legacy, nicely surveys Mahal's 30+ -year career. Particularly notable are the unreleased recordings from a 1969 record company convention during which Mahal performed with the nascent Pointer Sisters. My only complaint: Disc three leans too heavily on West Indian-inspired material, with keyboards and steel drums straight out of a tourism commercial.

Mike Bieber

Dos Gritos de Libertad
(Two Cries of Freedom)
José Serrano and Antonio "El Agujetas"
ROIR WORLD RUSCD 8246, 59:40
Sound: A, Performance: A

Flamenco has a great deal in common with the blues, not so much tonally or textually as spiritually. Each started as the acoustic expressions of passion and pain by an underclass, African-Americans and Gypsies. Members of these oppressed minorities frequently receive longer prison sentences than their countrymen. In Spain, the government joined with national flamenco clubs to sponsor a contest for the best inmate singers, holding out the promise of a reduced sentence. José Serrano and Antonio "El Agujetas" won, and this CD shows why.

The two men's styles are vastly different. "El Agujetas," of the Agujetas flamenco dynasty, has a subdued, ineffably sad quality that even permeates his "Seguiriyas." Serrano, meanwhile, has a big, bold, aggressive style that attacks the opening "Bulerías" and practically boils over his "Alegrías." His "Algarabías" and "Bulerías" often start at a full gallop, the kind of hard-core flamenco that is "dangerous jazz. Sometimes you need dangerous electricity to make the fire catch."

The 10 tracks on Like Minds are executed with sumptuous musicality and swinging detail, and the front line is heroic. But somehow the spark never fully ignites. Burton's title track is one exception, perhaps owing to its knotty melody and Roy Haynes's acerbic drumming. Corea's sprightly "Straight Up and Down" is another winner. On the other hand, Metheny's "For a Thousand Years" sounded better on Marc Johnson's The Sound of Summer Running, and Stan Getz's 1967 Sweet Rain album reveals more clearly the dusky dynamics of Corea's "Windows."

Like Minds
Gary Burton with Chick Corea, Pat Metheny, Roy Haynes, and Dave Holland
CONCORD 98018, 68:23
Sound: B, Performance: C

Big guns banding together to record each other's material is nothing new in jazz. This disc, however, documents the first meeting between Pat Metheny and Chick Corea, two of our most prolific and profound improvisers and composers, with Gary Burton, as always, lending a refined sleekness. Cosmopolitan settings, though, are not always an incentive for great jazz. Sometimes you need dangerous electricity to make the fire catch.

Ken Micallef
Dark City is a highly stylized sci-fi fantasy in which an alien race, the Strangers, stops the clocks at midnight in Dark City and then programs the citizens’ minds through a process called tuning.

The film begins with our hero, John Murdoch (Rufus Sewell), waking up naked in a bathtub and suddenly facing accusations that he’s behind a string of serial murders he cannot remember committing. Although none of the other characters can remember anything except vague sensations, Murdoch’s tuning has not completely taken: He struggles to overcome the power of the Strangers and destroy their hold on his town.

This is all brilliantly portrayed by actors who intentionally seem a little wooden and two-dimensional. The only character fully fleshed out is the mysterious Dr. Schreber, expertly played in Peter Lorre mode by Kiefer Sutherland, who is aiding the Strangers in their experiments. The sets are reminiscent of Fritz Lang’s Metropolis, with the humans living above ground in a claustrophobic clutter of skyscrapers that shut out all natural light while the Strangers reside underground in a fantastic, cavernous workshop, replete with intricate machinery and gadgets. It’s as if German Expressionism had survived to incorporate the wonder of color film and widescreen Panavision.

Dark City isn’t for everyone. Those wanting easy answers and familiar surroundings may be uncomfortable. But perhaps that’s the point. Those able to suspend belief and simply revel in the eye-popping visuals may call this movie, the first by director Alex Proyas since The Crow, a brilliant achievement. And its brilliance is surely accentuated by this DVD. The image is always sharp and clean—even in the many dark scenes, including those underground, which are virtually black and white.
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is made of Dolby 5.1 to completely immerse you in this tainted city’s dark underbelly.

Supplements include two excellent screen-specific commentary tracks, one with director Proyas and his production crew and the other with film critic Roger Ebert. There are also still-frame sections, which include set designs, comparisons to *Metropolis*, and much more. It all makes for a DVD that fully merit's its inclusion in New Line’s highly regarded Platinum Series.

*Fallen* 1997; *R* rating; two-sided (one side, 2.35 aspect ratio; the other, full-screen pan-and-scan); English Dolby Digital 5.1; French Dolby Digital two-channel matrix surround; English, French, and Spanish subtitles; closed-captioned; includes theatrical trailers, feature length commentary, and TV spots. WARNER HOME VIDEO 16434, 125 minutes, $24.98

Picture: A, Sound: A, Content: B+

A demon jumps from body to body via touch, taunting the investigating officer (Denzel Washington) who is trying to catch it before it kills again. In this very slick production, the recurring theme of “Time Is On My Side,” sung by the demon through the person it possesses, was an interesting choice, and the twist ending is truly original. Yet it all seems oddly dispassionate. The characters just never seem quite normal enough for us to really care about what happens to them.

The DVD, though, is still worth seeing and listening to—at least once—for its immaculate video transfer, absorbing Dolby 5.1 mix, and that surprise ending. In addition, the DVD offers interesting commentary by director Gregory Hoblit, screenwriter Nicholas Kazan, and producer Charles Roven. R.B.

*Suicide Kings* 1997; *R* rating; one-sided, dual-layer (1.85:1 aspect ratio); Dolby Digital 5.1; Spanish subtitles; closed-captioned; includes commentary track, alternate endings, and trailers. ARTISAN 60472, 103 minutes, $24.98

Picture: A, Sound: A, Content: B+

This nifty cat-and-mouse film noir received almost no theatrical attention but might gain new life with its feature-laden DVD. When the sister of one, and the lover of another, of five college buddies is kidnapped, those rich kids devise a plan to kidnap a mob boss (Christopher Walken) and force him to use his connections to help raise the $2 million ransom. But another supplement allows us, through the use of our players’ “Angie” buttons, to alternate between the audience’s and the director’s points of view, while yet another option offers a storyboard comparison. The bios are interesting, too, with live-action demonstration scenes complementing the printed bios of key players. I give the video transfer an A, and the use of Dolby 5.1 is very skillful.

My only complaint: The layer shift is fairly obvious. Why not do this change on a “fade to black”? No one would be the wiser. R.B.

*Boublil and Schonberg: Les Misérables in Concert* 1995; no rating; two-sided (1.33:1 aspect ratio); Dolby Digital two-channel stereo; English subtitles. VCI/COLUMBIA TRISTAR 88709, 147 minutes, $24.98

Picture: A, Sound: A, Content: A

To commemorate the 100th anniversary of *Les Misérables*, the internationally renowned show, a company of more than 250 performers assembled in the Royal Albert Hall, complete with what looks like the entire Royal Philharmonic Orchestra. The cast was chosen from those who have played the roles on both sides of the Atlantic. (Colm Wilkinson, who appeared in the original London and Broadway productions and on the original London cast recording, portrays Jean Valjean.) The acting and singing maintain a level of virtuosity, precision, and involvement not often encountered in a live production. The principals appear in appropriate costumes and makeup, and there is enough post-production footage included, along with summaries of the plot, to give a sense of the show beyond the concert staging.

The video is quite good. Despite the gargantuan nature of this production, lots of close-ups of the main characters help create a sense of intimacy. Switchable subtitles are provided, but, wonder of wonders, I didn’t need them because I could understand every single word; I even comprehended passages for chorus—a remarkable feat. The overall sound is excellent, well balanced, and clean yet still presents a good acoustic image of the large hall. Even the layout of the DVD has been carefully accomplished; side 1 contains Act I, while side two holds Act II. More shows and operas done with this care and organization would surely be appreciated on DVD.

R.B.

*The Basketball Diaries* 1995; *R* rating; one-sided (1.85:1 aspect ratio); Dolby Digital 5.1; closed-captioned; includes interviews and an anti-drug trailer. PALM PICTURES 800 635 899-2, 102 minutes, $29.98

Picture: A, Sound: B+, Content: A

One of Leonardo DiCaprio’s early successes, *The Basketball Diaries* is a gritty film about poet Jim Carroll’s harrowing descent into drug addiction during his teens. Because of its unflinching realism, it’s sometimes difficult to watch, but the performances from DiCaprio, Mark Wahlberg, and Bruno Kirby are outstanding. The disc, a very good DVD transfer, includes an anti-drug trailer, television spots, and brief interviews with the cast members and director Scott Kalvert.

R.B.

*Quatermass and the Pit* 1967; no rating; two-sided (1.66:1 aspect ratio); Dolby Digital 5.1; includes commentary track, U.S. and U.K. trailers, documentary, and TV spots. ANCHOR BAY DV10505, 98 minutes, $29.98

Picture: A, Sound: B+, Content: B+

*Quatermass and the Pit* is the third and last installment of the British film series involving a no-nonsense professor who’s also a self-acclaimed astronomy expert. Released in the late ’60s in the United States as *Five Million Years to Earth*, this movie, featuring intelligent dialog and good acting, finds Quatermass and friends unraveling the mysterious origins of a spaceship and nearby alien fossil bones discovered by construction workers digging below the streets of London.

This is the first release from Anchor Bay in its Hammer Collection, offerings from the British studio devoted to sci-fi and horror movies. Like other titles in the series, *Quatermass and the Pit* is in its proper (widescreen) aspect ratio, in a print that looks recently minted. There’s also a short documentary, which contains scenes from other Hammer sci-fi films, several trailers, and commentary by director Roy Ward Baker and writer Nigel Kneale. While the remixed sound is fine, the original mono track is presented, too, so viewers can choose. Hammer fans—rejoice! R.B.
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Audio Equipment Built, Repaired, Modified and restored by Richard Modafferi, independent consultant to Audio Classics. Now a 25mm Sonotex fabric dome, with silver voice coil wire, a machined aluminum face plate and a rear chamber to eliminate unwanted reflections. The silver wire improves electrical conductance to provide better sensitivity to fine details in the musical signal.

Cabinets: The cabinets are oak veneer with a slot loaded rear vent and full black textile grill. Cabinets are available with a clear finish or ebony finish. Cabinets are 22" high, 9 1/2" wide and 14 1/2" deep. The cabinets, grills and crossovers are fully finished and assembled. You receive all parts necessary to construct the kit.

Conclusion: The Odin speaker is the result of a combined effort of Seas, Zeligman Labs and Madisound. The Odin was subject to extensive listening tests in both Norway and the US. All involved agree that the combination of high quality parts, design experience and listening has created a memorable musical experience.

Price: Kit with cabinets are $945 per pair. Kit without cabinets are $725 per pair.

WOOFERS

The Odin uses two woofers per cabinet: the Seas Excel W17E 002. This 7" woofer has a specially coated magnesium cone and a solid copper phase plug. The phase plug along with copper shorting rings on the pole piece help reduce distortion by dissipating heat and minimizing the inductance. This combination of materials also results in a design that is a visual work of art.

Tweeter: The Seas Excel T25-001 tweeter is a 25mm Sonotex fabric dome, with silver voice coil wire, a machined aluminum face plate and a rear chamber to eliminate unwanted reflections. The silver wire improves electrical conductance to provide better sensitivity to fine details in the musical signal.

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It's great to see prices of stand-alone CD recorders fall to nearly $500. The catch, however, is that most CD-R machines require the royalty-paid consumer-audio discs that cost far more than the data/pro discs that computer and professional CD burners can use.

One way out of that jam is the Fostex CR-200. Priced at $1,495, this designed-for-musicians, stand-alone CD-R deck can record onto those $2 (and cheaper) CD-R write-once discs. It has a host of high-end features, including a built-in sampling-rate converter, balanced XLR and unbalanced RCA analog inputs, three types of digital inputs (AES/EBU professional, Toslink optical, and coaxial), and a digital output. The Fostex recorder also has a Pioneer Stable Platter transport, recording level meters, a headphone jack with separate volume control, and a switchable copy-limit function. A full-function remote control is included.

The CR-200 is simple to use: Pop a blank CD-R upside onto the platter, and commence recording. Dubbing from another CD player is easy using the Digital Synchro mode, which enables exact transfer of CD, MD, or DAT audio and accompanying track numbers and time information. And you can manually place track IDs on the CD for both analog and digital sources. The CR-200 automatically converts digital signals having 32- or 48-kHz sampling rates to 44.1 kHz so they can be recorded onto CD. Once a recording is done, you permanently write the table of contents with a simple sequence of button pushes. Presto, you've got a CD that's compatible with any player.

The recorded audio quality from the Fostex CR-200 was first-rate with analog or digital sources. And when I made direct dubs from DAT or CD, I couldn't tell the difference between an original and its clone. I'm giving the CR-200 a B grade rather than an A because it is quite a bit more expensive than most other CD-R decks. But in performance, it is indeed Grade A. (Fostex: 15431 Blackburn Ave., Norwalk, Cal. 90650; 562/921-1112.)

An $11,000 single-ended stereo tube power amplifier from Wyetech Labs, a small Canadian company, the Topaz 211A is very impressive. Rated at 18 watts per channel and weighing in at a backbreaking 106 pounds, this amp is a marvel of build and parts quality. It uses one of my favorite output tubes, the carbon-plate 211, which has a directly heated thoriated-tungsten filament. Other parts used in the Topaz include AudioNote output transformers, Solen polypolypropylene capacitors, and Holco and RCD resistors. Many of the components are mounted to turret terminals plugged into Vector circuit boards, with short wires beneath the boards connecting the terminals.

The Topaz 211A's sound matched its build quality. Used with a pair of Truvey's highly efficient (and highly revealing) Churchill speakers, the Wyetech amp sounded very relaxed and natural. It had great dynamics, inner detail, and space, and the bass was very powerful, tuneful, and extended. This is one of the best single-ended amps I have ever auditioned. (Wyetech Labs: c/o North-Country Audio, Cadence Building, Redwood, N.Y. 13679; 315/387-2852; www.cadencebuilding.com.)
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