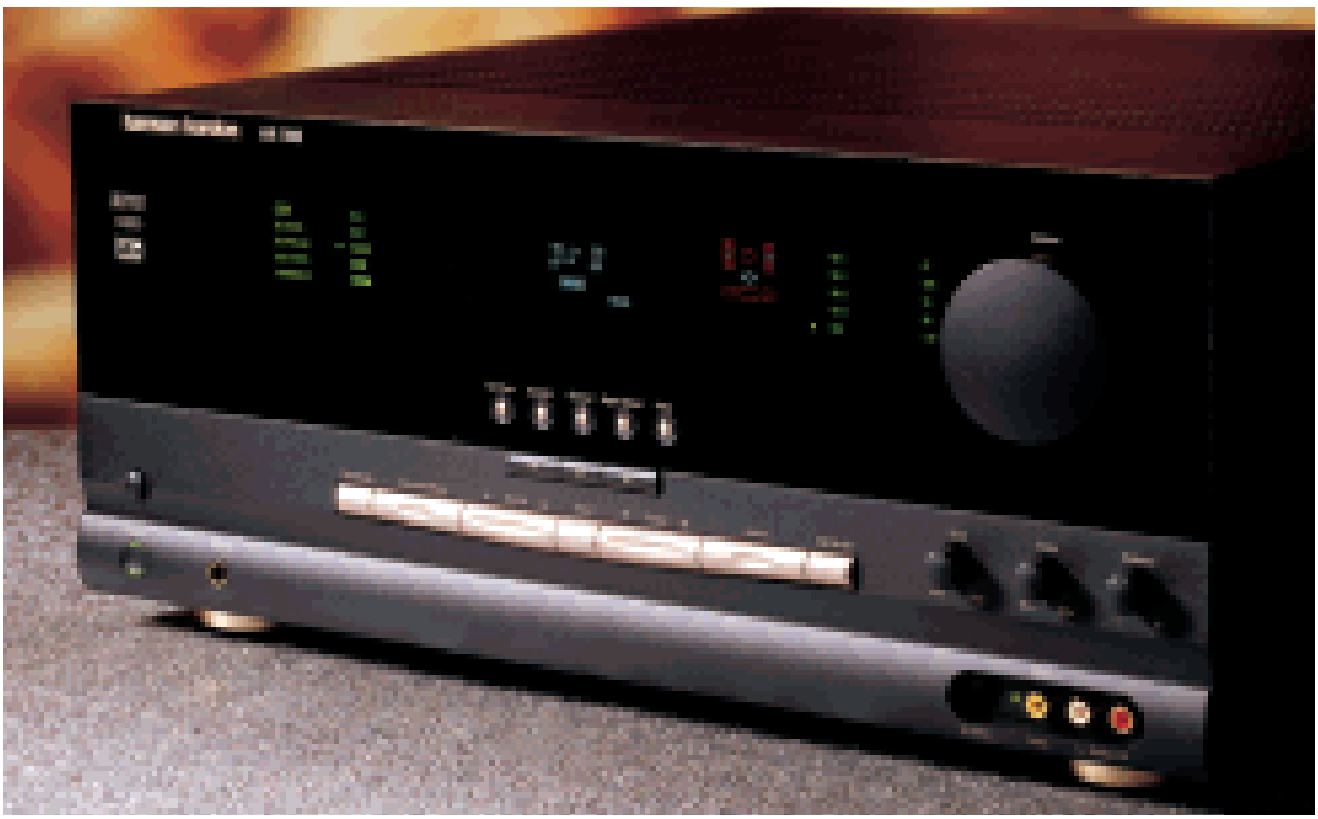
test report BY DANIEL KUMIN

Harman Kardon

AVR 7000 Digital Surround Receiver



PHOTOS BY TONY CORDOZA

Harman Kardon's new flagship A/V receiver, the AVR 7000, is one deep product — and I mean that literally. It's no less than 20 inches from front to back, which means you'll need some serious shelving for it to sit on. Otherwise, it's more or less conventionally laid out, with a tall front panel dominated by a multicolor display and a single large volume knob. Its glossy black-and-silver faceplate is handsome, and its controls are conveniently arranged.

There are tone controls — something you don't see on all receivers these days — plus a headphone jack. But the 7000's most interesting front-panel feature is one you're unlikely to notice without carefully reading the manual: the front A/V input, typically used for a camcorder or game console, can be configured as an A/V *output* instead, for convenient dubbing of any selected source to a portable A/V or audio recorder (like a MiniDisc or MP3 device). You have to access a setup menu to make this change (the receiver automatically switches the connection back to input mode when it's turned off), and an adjacent LED turns from green to red to indicate that the output mode is engaged. It's such a handy idea, I can't imagine why nobody thought of it before — at least I've never encountered it.

Harman Kardon has endowed the AVR 7000 with the usual bazillion-jack rear panel, including four digital audio inputs, two component-video inputs, and one component output, which lets you switch two high-quality A/V sources like a DVD player and a DTV tuner. Linked pre-out/line-in jack pairs for all five channels plus a 5.1-channel line input for an outboard decoder or multichannel DVD-Audio or SACD player earn the AVR 7000 an A grade in future-proofing. It carries most of the other usual flagship receiver features as well, leading with the high-performance amplifier section I've come to expect from Harman Kardon's top models.

The AVR 7000 has an unusual arrangement of setup options. You can set certain defaults independently for each input to be recalled automatically every time the corresponding source is selected. The defaults

fast facts

RATED POWER 100 W x 5 into 8 ohms from 20 Hz to 20 kHz with less than 0.07% THD, channels driven individually
DIMENSIONS 17 3/8 inches wide, 7 5/8 inches high, 20 1/2 inches deep
WEIGHT 49 pounds
PRICE $1,799
MANUFACTURER Harman Kardon, Dept. S&V, 250 Crossways Park Dr., Woodbury, NY 11797; phone, 800-422-8027; Web, www.harmankardon.com

The Harman Kardon AVR 7000 capably handled *Jumanji*'s elaborate Dolby Digital soundtrack — stampeding elephants and all.

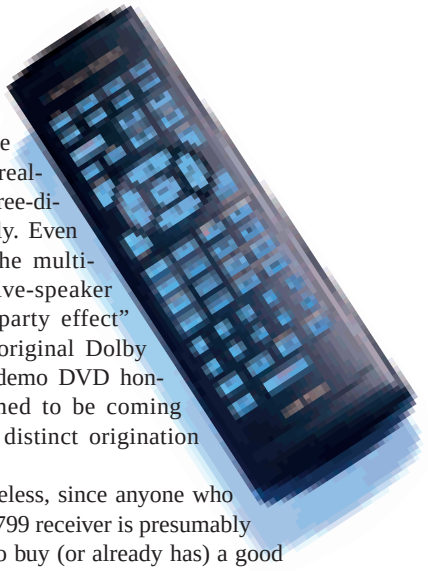
include speaker size, surround mode, and digital or analog source (the four digital inputs can each be assigned to any source). The remaining key parameters — crossover frequency (80, 90, or 100 Hz), relative channel levels, and center- and surround-channel delays — are also individually set and remembered, but in this case by surround mode, *not* source. In other words, the parameters stay the same whether you use, say, the Pro Logic surround mode for a CD or a videotape program, though the speaker-size setting might change between inputs.

This arrangement provides tremendous flexibility in setting up and fine-tuning your system, but in all honesty, I found it more than a little confusing at first, and the manual didn't help too much. And while the AVR 7000 deserves kudos for storing relative channel levels independently by surround mode, it loses points for not having separate "user trims" for each channel. When you tweak the center-channel level by a couple of decibels, this change is added to or subtracted from the setup level for that mode, making it more difficult to return to your calibrated defaults.

All that aside, the AVR 7000's sonic performance was rarely anything less than superb. The amount of clean output power was exemplary in both stereo and surround playback, and Dolby Digital and DTS soundtracks both yielded top-shelf performance. Even the densest mixes of music, sound effects, and dialogue, such as those throughout the elaborate Dolby Digital soundtrack of *Jumanji*, failed to trip up this receiver. It always produced detailed, clear, and effortless sound, even when I drove the system to cinemalike levels — and even without the aid of a powered subwoofer.

Full-range (no subwoofer) playback of stereo CDs over my low-sensitivity left/right front speakers was open and dynamic, especially with obsessively detailed productions like Steely Dan's *Two Against Nature*. This receiver delivered performance that I would have expected only from a separate preamp and power amp.

Like many A/V receivers these days, the AVR 7000 includes a virtual surround mode meant to simulate the effect of multichannel playback with just two speakers. But unlike most such processing, Harman Kardon's VMAx worked stunningly well. It's the first virtual surround system I've used that actually had me getting up to make sure the surround speakers really *weren't* producing any sound. In my room, to hear the effect I had to sit precisely centered between the front left/right speakers and keep my head steady — even turning it to one side caused the surround sound to collapse. But at its best it was nothing less than astonishing. The final audio vortex in *Jumanji*'s penultimate sequence really spun three-dimensionally. Even tougher, the multilingual five-speaker "cocktail-party effect" from the original Dolby Labs test/demo DVD honestly seemed to be coming from five distinct origination points.

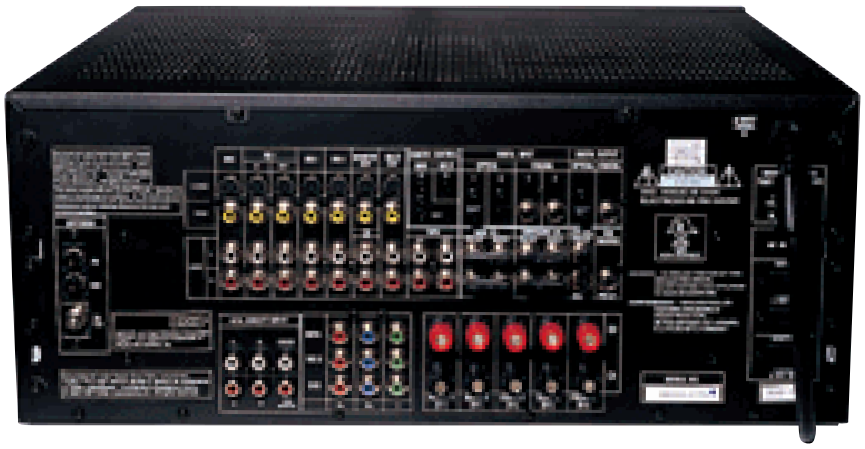


Nevertheless, since anyone who buys a $1,799 receiver is presumably planning to buy (or already has) a good 5.1-channel speaker system as well, the mind-blowing VMAx processing counts as more of a "because we could" gesture than a "because you need it" one.

The AVR 7000 does feature a handful of "extra" ambience modes using digital signal processing, including one Theater and two Hall modes, but the headliner is called Logic 7, which comes in two flavors, Cinema and Music. Derived from Lexicon's impressive 7.1-channel surround program of the same name (Lexicon is also owned by Harman International), the AVR 7000's Logic 7 is a 5.1-channel program that ". . . extracts the maximum surround information from either surround-encoded programs or conventional stereo material." Plenty of manufacturers have made the same claim for their proprietary DSP processing, but Logic 7 delivers. Most stereo music recordings I listened to with it engaged opened up and sounded solidly three-dimensional. There was far less of the mono dominance that Pro Logic processing often imposes on stereo recordings and little or none of the timbral shifts that too many other DSP modes induce.

key features

- Dolby Digital, DTS, Dolby Pro Logic, and HDCD decoding
- 5 DSP ambience modes, including Cinema and Music
- VMAx virtual surround and Logic 7 mode
- Component-video switching
- 5.1-channel direct input
- 5-channel pre-out/main-in jacks
- 2 coaxial, 2 optical digital audio inputs
- 5 A/V inputs (front-panel set can be switched to output)
- 2 audio-only analog inputs
- 1 optical, 1 coaxial digital audio output
- Multiroom/multisource A/V outputs and functions
- Backlit preprogrammed/learning remote
- 30 AM/FM tuner presets



HIGH POINTS

Topnotch amplifier performance.
Flexible full-system remote.
Front-panel A/V inputs can double as record outputs.
Fine all-purpose surround from Logic 7 mode.
Unusually effective virtual surround.

LOW POINTS

Setup options could be confusing.
Temporary channel-level changes are inconvenient.
Sub-par FM selectivity.

My latest installment of the complete Shostakovitch string quartets — from a cycle no less excellent for being on the budget label Naxos — sounded stunningly good with Logic 7 Music processing. It was more natural, more involving, and just plain better than ordinary stereo. However, I did note a decidedly different net bass level on a number of studio-recorded pop CDs, compared with two-speaker listening, and on some material I occasionally heard a faint trace of "pumping" on heavily centered vocalists.

More seriously, I also encountered one recording that was able to overload the AVR 7000's DSP engine. At about 4:10 into "Gaia" from James Taylor's *Hourglass*, there's a very dynamic big-drum flourish. In either the Logic 7 Cinema or Music mode, the passage induced severe clicking from both the front left and center channels, regardless of the master volume or channel-trim levels. The clicks were absent in stereo mode and in the AVR 7000's other surround modes, and they also disappeared when I used an analog instead of a digital input. Analysis of the disc showed it to be recorded at too high a level. Harman has assured us that current production units handle overload more gracefully.

I found the AVR 7000's full-system remote control easy to learn — not least because it has the same layout as that on half a dozen different handsets I've encountered in the past year or so. It's a very good remote, with sensible button spacing, excellent key lighting, and a logical control layout. Best of all, it includes both a generous library of preprogrammed, multibrand codes and full learning capability, so it stands ready to accommodate virtually any combination of components. You can even add, delete, or overwrite a command or two from an otherwise preprogrammed set of codes. This is the only way to fly if you want to develop your receiver's remote into a truly all-purpose system commander. The remote even offers a "volume punch-through" option that lets you keep its receiver volume buttons alive even if you switch control modes — say, to change channels on the TV. Of course, extensive macro-command capabilities are also onboard. This is a top-shelf remote.

Although the AVR 7000 sounded fine on strong stations, its FM reception was not outstanding. Poor selectivity let strong stations occasionally "pop through," but that won't be a problem for most users.

The AVR 7000 is an outstanding — if expensive — A/V receiver that's refreshingly free of frivilous features. The Logic 7 modes offer effective everyday surround listening, and the remote is one of the better system controllers available. The unusual array of setup options requires a bit of forethought to get the most out of this receiver, but the amplifier section and surround processor are clearly benchmark performers. What's not to like? S&V

in the lab

DOLBY DIGITAL PERFORMANCE

All data were obtained from the Dolby Labs test DVD using dithered test signals, which set limits on distortion and noise. Reference input level is –20 dBFS, and reference output is 1 watt into 8 ohms. Reference output was obtained with volume set to –10 dB. All are worst-case figures where applicable.

Output at clipping (1 kHz into 8/4 ohms)
one channel driven.....168/249 watts
five channels driven (8 ohms).....113 watts

Distortion at 1 watt (THD+N percent, 1 kHz)
8/4 ohms.....0.03/0.04%

Noise (A-wtd).....–76.5 dB

Excess noise (with signal)
16-bit (EN16).....+2.45 dB

Frequency response (20 Hz to 20 kHz)
front right.....+0, –0.5 dB

Channel imbalance
at reference output level.....0.5 dB spread

Subwoofer-output frequency response
9 dB/octave above –6 dB point of 110 Hz

High-pass-filter frequency response
9 dB/octave below –3 dB point of 76 Hz

Maximum unclipped subwoofer output
(at reference volume setting).....7.9 volts

Subwoofer distortion (from 5.1-channel, 31-Hz, 0-dBFS signal; master-volume at reference level; subwoofer trim set to 0).....1.6%

STEREO PERFORMANCE, DIGITAL INPUTS

Volume setting for reference output level was –11 dB. Speakers set to "large," subwoofer off.

Output at clipping
(1 kHz, 8/4 ohms).....166/255 watts

Distortion at 1 watt
(THD+N, 1 kHz, 8/4 ohms).....0.02/0.03%

Linearity error (at –90 dBFS).....0.05 dB

Noise (A-wtd).....–74.3 dB

Excess noise (with/without signal)
16-bit (EN16).....+1.35/+1.5 dB
quasi-20-bit (EN20).....+15.25/+15.15 dB

Noise modulation.....0.3 dB

Tone-control range
100 Hz.....+9.8/-8.6 dB
10 kHz.....+10/-9.4 dB

Frequency response (tone controls off)
20 Hz to 20 kHz +0, –0.45 dB

TUNER PERFORMANCE

All figures are for FM only except frequency response.

Sensitivity (50-dB quieting)
mono.....21.6 dBf
stereo.....43.4 dBf

Capture ratio (at 65 dBf).....1.5 dB

AM rejection.....67.8 dB

Selectivity
alternate-channel.....72.9 dB
adjacent-channel.....8.7 dB

Noise (at 65 dBf)
mono.....–75.0 dB
stereo.....–68.1 dB

Frequency response
FM.....30 Hz to 15 kHz +2.05, –0.42 dB
AM.....76 Hz to 4.02 kHz +0.40, –6.0 dB

The AVR 7000's technical performance was fine in almost every regard. I was impressed by the receiver's ability to maintain comfortably greater than 100 watts output with all channels driven, even with a measurably sagging AC supply; this suggests excellent real-world dynamic potential. Noise and distortion results were very good in all modes as well. The subwoofer output, measured with new test signals (see "Tech Talk," page 39), went into slight clipping overload at 1 dB below full output. This did not change with any setting of the receiver's subwoofer-output level control.

The high- and low-pass crossover filters exhibited relatively slow rolloffs of about 9 dB per octave, a bit less than the usual Dolby Digital minimum of 12 dB per octave (many processors and receivers impose a steeper filter to aid subwoofer performance). The relatively mild filters are not ideal, but I didn't detect any audible shortcomings because of them. — *D.K.*