

in the lab

	ONKYO TX-SR501	PANASONIC SA-XR25S	YAMAHA RX-V440
DOLBY DIGITAL PERFORMANCE All data obtained from various test DVDs using test signals incorporating dither, which sets limits on measured distortion and noise performance. Reference input level is -20 dBFS, and reference output level is 1 watt (2.83 volts) into 8 ohms, obtained with the volume controls set as indicated below. All speakers set for "large" except for subwoofer and high-pass-filter measurements. All are worst-case figures where applicable.			
Volume-control setting for reference 1-watt output from all channels with reference -20-dBFS input	53	-20	-24
Output at clipping (1 kHz) one channel driven into 8/4 ohms five channels driven (8 ohms)	124/183 W (20.9/22.6 dBW) 77 W ¹ (18.9 dBW)	96/172 W (19.8/22.4) dBW) 82 W (19.1 dBW)	126/194 W (21/22.9 dBW) 34 W ² (15.3 dBW)
Distortion at 1-watt output (1 kHz, THD+N, 8/4 ohms)	0.06/0.06%	0.15/0.16%	0.03/0.04%
Noise level (16-bit signal, A-wtd)	-70.8 dB	-75.1 dB	-75.5 dB
Excess noise (16-bit, with sine tone)	+6.1 dB	+0.2 dB	+0.3 dB
Frequency response (20 Hz to 20 kHz)	+0, -0.2 dB ³	+0.6, -0 dB	+0, -0.8 dB
<small>¹ Short-term measurement; the TX-SR501 produced about 47 watts (16.7 dBW) when all channels were driven for durations greater than about 1 second. ² Results obtained with the RX-V440's rear-panel 8/4 ohm switch in either position; see notes. ³ Front L/R only (center and surround channels set to "small"); see notes.</small>			
BASS-MANAGEMENT PERFORMANCE Measured results obtained with Dolby Digital signals.			
Subwoofer-output frequency response	24 dB per octave above -6-dB rolloff point of 80 Hz	18 dB per octave above -6-dB rolloff point of 100 Hz	18 dB per octave above -6-dB rolloff point of 109 Hz
High-pass-filter frequency response	12 dB per octave below -3-dB rolloff point of 80 Hz	12 dB per octave below -3-dB rolloff point of 122 Hz	12 dB per octave below -3-dB rolloff point of 90 Hz
Maximum unclipped subwoofer output (from 6-channel, 30-Hz, 0-dBFS worst-case signal at reference settings)	7.6 volts	5.6 volts	7.1 volts
Subwoofer distortion (THD+N with worst-case signal)	0.03%	1.1%	6.3%
Source/media consistency	same for all digital inputs and analog stereo; none for multichannel analog input	same for all digital inputs and analog stereo; none for multichannel analog input	same for all digital inputs and analog stereo; none for multichannel analog input
Speaker-size selection	all channels can be set to "small"	all channels can be set to "small"	all channels can be set to "small"
MULTICHANNEL PERFORMANCE, ANALOG INPUTS All speakers set to "large," subwoofer off. Reference input level is 200 mV. Reference output level is 1 watt, obtained with volume set as indicated below.			
Volume-control setting for reference 1-watt output	57	-16	-21
Noise level (A-wtd)	-84 dB	-75.5 dB	-85.4 dB
Distortion at 1-watt output (1 kHz, THD+N, 8/4 ohms)	0.02/0.03%	0.13/0.14%	0.04/0.05%
Frequency response	10 Hz to 200 kHz +0, -1 dB	10 Hz to 38.4 kHz +0.7, -0.1 dB	10 Hz to 150 kHz +0, -1.2 dB

In nearly all respects, the lab results of these receivers were impressive. All three produced ample power in stereo and surround. The Onkyo's steady-state power in both stereo and multichannel tests was limited by a deliberate protection scheme that lowered output after almost a second of being driven at full power. Something similar appeared to be at work during the Yamaha receiver's steady-state all-channels test; the RX-V440 could produce substantially more power with three channels driven.

Noise performance was uniformly excellent, especially considering these models' prices. Note that the Panasonic receiver's results on all noise tests

were somewhat compromised by relatively large ultrasonic components (artifacts of its digital amps) influencing the results even with audio-band filtering in the test loop. And though I can't explain it, the Onkyo produced 4 dB more noise from our Dolby Digital "dithered-silence" test track than from our PCM stereo one. Even more surprising, this figure reflects L/R front-channel performance. Results from the center and surround channels were uniformly about 3 dB better, suggesting that different digital-to-analog converters were employed on those channels. All three receivers showed meaningful gains with 96-kHz/24-bit signals, the Yamaha in particular.

— D.K.