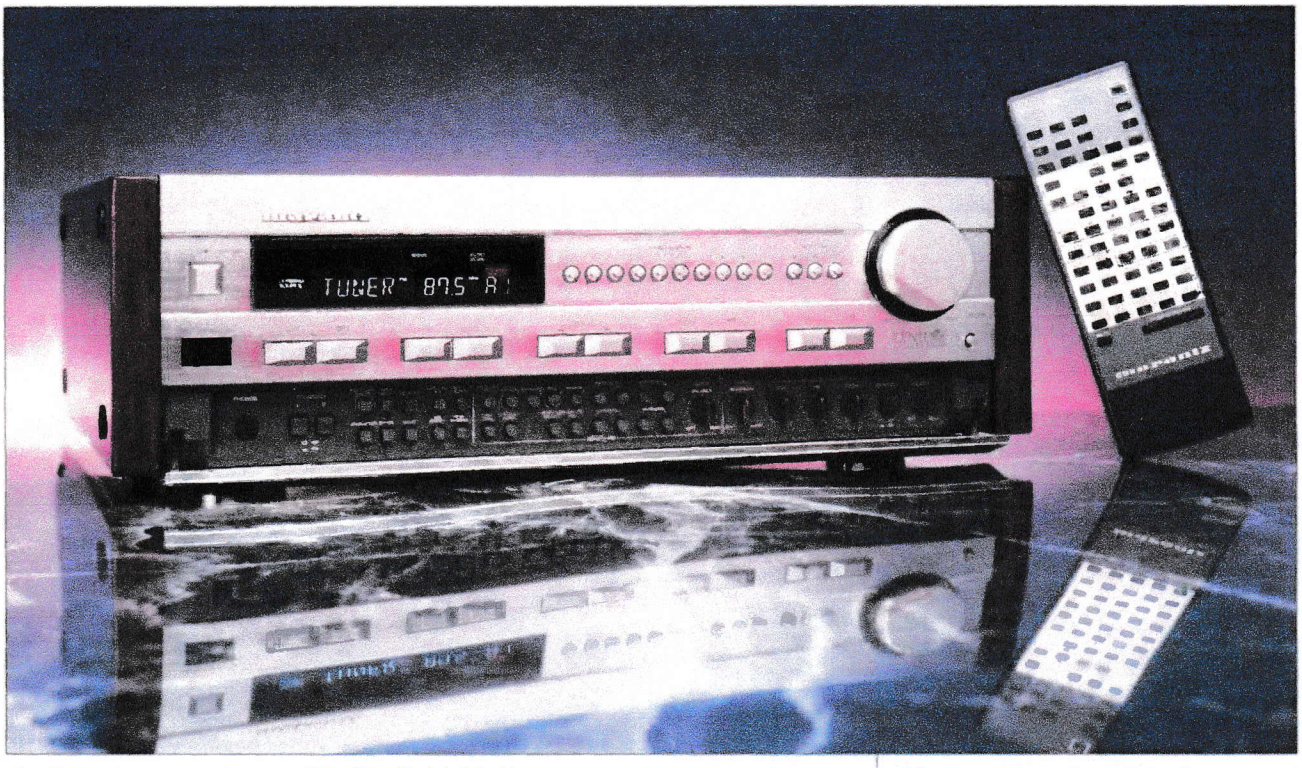

MARANTZ RS 3559 A/V RECEIVER

Julian Hirsch, Hirsch-Houck Laboratories

THE Marantz RS 3559, which heads the company's Century Collection, is a large, powerful audio/video receiver offering an exceptional combination of control features and high performance along with fresh, distinctive styling. It is basically an AM/FM stereo receiver, but it has a total of five power amplifiers. In addition to extensive audio and video signal-switching capabilities, it contains surround-sound circuits, including Dolby Pro Logic.

The main amplifiers of the RS 3559 are rated to deliver 125 watts per channel into 8-ohm loads from 20 to 20,000 Hz with less than 0.02 percent total harmonic distortion (THD). Although the amps are not rated for use with 4-ohm speakers, a switch on the rear apron reduces the power-supply voltage to allow safe operation into 4 ohms (the minimum load impedance for which the receiver is recommended). The two surround-sound (rear-channel) amplifiers, as well as a center-channel amplifier for use in a fully implemented Dolby Pro Logic playback system, are each rated at 20 watts into 8 ohms. A phantom center-channel setting is provided for use if a separate speaker is unavailable.

The RS 3559 features an unusual cooling system that Marantz calls a "thermal tunnel." The heat sink for the output transistors is a horizontal enclosed structure with the cooling fins facing inward. A tiny (2½-inch) fan at the rear starts to turn slowly as the amplifier section warms up, drawing in air through slots in the bottom plate, passing it over the fins, and expelling the warm air from a grille on the back of the receiver. As the temperature rises, the fan speeds up.

Outwardly, the RS 3559 presents a disarmingly simple appearance. The upper portion of the front panel contains a display window, a row of thirteen small round buttons, a sculptured power button, and a large volume knob. Ten of the small buttons (numbered 1 through 0) are preset station selectors, and three MULTISCAN buttons (marked A, B, and C) select the groups of preset stations. Each group holds up to ten stored frequencies, providing a total of thirty choices and allowing station grouping to suit the individual user's listening tastes.

The display window normally shows the tuner frequency and, if applicable, its location in the memory bank. The status of other operating features, such as the surround-sound system and tape-dubbing paths, is also displayed, together with a three-segment signal-strength indicator and a stereo/mono-mode indicator. The RS 3559 has a convenient alphanumeric memory and display feature that allows a station's call letters or other information (up to four characters) to be stored with its frequency.

A row of ten sculptured, rectangular buttons extends across the middle of the panel. Two are the up/down tuning controls, and the oth-

ers select the program source: AM, FM, VCR1, VCR2, phono, TAPE1, CD, and VDP (videodisc player). Pressing any front-panel button produces an audible beep from the receiver. The large volume knob is surrounded by an illuminated orange arc whose length shows the control setting.

The visible front-panel controls of the RS 3559 give no hint of its exceptional versatility. Pressing a small button near the volume control, however, causes the bottom section of the panel to hinge downward, revealing no fewer than thirty more buttons, six small knobs, and a headphone jack. Fortunately, most of them are used only during the initial setup process.

The concealed knobs control bass, midrange, and treble tone, left/right channel balance, input balance for the Dolby Pro Logic system, the TAPE2 monitor, and video sharpness (the only video adjustment). Three buttons control the loudness compensation and independently switch the two pairs of front-channel speaker outputs. Smaller buttons adjust the levels of the rear (surround) and center speakers over a ±20-dB range in 1-dB steps, with the settings appearing temporarily in the front-panel display. Another pair of buttons step the delay time of the surround channels between 0 and 30 milliseconds (ms) or 20 to 30 ms in the Pro Logic mode. In the two non-Dolby surround modes, Hall and Stadium, the "echo level" can be varied from 0 to 2.4 ms in steps of 0.3 ms. "Echo level" apparently refers to the decay time of the reverberant signals generated in the surround circuits.

The rear of the Marantz RS 3559 contains stereo inputs for a magnetic phono cartridge and a CD player, plus playback and recording jacks for the audio tape decks. There are separate input and output jacks (normally joined by links) for an external signal processor such as an equalizer. A separate group of video and audio jacks is provided for one or two VCR's and a VDP. Full input/output paths are provided only for VCR1, whose audio and video outputs also go to an external video monitor; VCR2 (like the VDP) is usable only as a playback device in this system, playing through VCR1, although video and audio programs can be dubbed from either VCR2 or the VDP to VCR1.

Coaxial connectors are provided for two 75-ohm FM antennas (one is designated for use with a cable FM system), and there are spring connectors for the supplied detachable AM loop antenna. A recessed slide switch changes the amplifier operating voltage for use with either 4- or 8-ohm speakers. The main (front) speaker outputs, insulated binding posts on ¾-inch centers, accept either stripped wire leads or banana plugs. Above them is a set of connectors for the surround speakers, and in the corner there are connectors for a center (front) speaker. A CENTER OUT jack carries the same signal at line level for use with an external amplifier when more power is needed. Both of the AC convenience outlets are switched.

The RS 3559 is supplied with a wireless remote control that duplicates all essential functions, including adjusting the motor-driven volume knob, power switching, and level and balance adjustments for the surround channels.

The Marantz RS 3559 measures 17 inches wide, 16⅝ inches deep, and 6 inches high and weighs about 32¾ pounds. It is available in black or gold finish with contrasting markings. Price: $1,000. Marantz, Dept. SR, 700 N. Commerce St., Aurora, IL 60504.

Lab Tests

Although the Marantz RS 3559 is a very powerful receiver, it did not become particularly hot during the preconditioning period (1 hour at one-third rated power from both main channels). In fact, it never became more than moderately warm even over its central heat sink, and most of its exterior surface remained close to room temperature. Moreover, at no time was the cooling fan audible, even close to the receiver and in a quiet room.

Driving 8-ohm loads at 1,000 Hz, the main channels clipped at 178 watts. With 4-ohm loads (still using the 8-ohm switch setting on the receiver), the clipping power level was 260 watts per channel, and with the switch in the 4-ohm setting, it was 158 watts. Because of the manufacturer's warnings not to use load impedances lower than 4 ohms, we did not make clipping measurements into 2 ohms.

Nevertheless, the main amplifier proved to have a considerable current-output capacity. In dynamic power tests, the 8-ohm output was 225 watts, increasing to 365 watts into 4 ohms (190 watts with the 4-ohm switch setting). The 2-ohm dynamic output was an impressive 305 watts.

The distortion between 12.5 watts and the rated 125 watts output (into 8 ohms) was typically 0.012 to 0.022 percent from 30 to 2,000 Hz. It gradually increased at higher frequencies, to a maximum of 0.11 percent at 20,000 Hz and 125 watts. At 1,000 Hz, the 8-ohm distortion was between 0.012 and 0.024 percent from 10 to 175 watts. Into 4 ohms, it was fairly similar, reaching 0.014 percent at 250 watts output. The main amplifier section's slew factor exceeded 25. Our only measurement of the surround-channel amplifiers was to establish their clipping level, which was slightly over 20 watts.

The input sensitivity for a 1-watt reference output was 16 millivolts (mV) at the CD input and 0.2 mV at the phono input, with respective A-weighted noise levels of −80.5 and −75 dB. The phono-preamplifier input impedance was 52,000 ohms in parallel with 175 pF, and it overloaded at 1,000-Hz equivalent inputs from 74 to 83 mV over the 20- to 20,000-Hz range.

The preamplifier section's frequency response through a high-level input was +0.25, −0.75 dB from 20 to 20,000 Hz. The RIAA equalization error was +0, −0.1 dB from 100 to 20,000 Hz, increasing at low frequencies to +0.6 dB at 20 Hz. The loudness contours boosted both low and high frequencies moderately, to a maximum of 5 to 7 dB at either end of the spectrum, and the amount of boost remained constant for all volume-control settings lower than −10 dB. The tone controls had maximum ranges of about ±9 to 10 dB at the frequency extremes, with the usual variable-turnover frequency characteristic in the bass and the treble curves hinged at 2,000 Hz. The midrange control had

a maximum range of about ±6 to 7 dB at 1,000 to 1,500 Hz, and the control's effect extended to 100 and 10,000 Hz.

The FM tuner performance was very good, generally matching or surpassing the receiver's ratings. The 50-dB quieting sensitivity was 14.2 dBf in mono and 38 dBf in stereo (the stereo threshold was 27 dBf). Mono distortion was low, just over 0.1 percent over a wide range of signal strengths, but in stereo a high input (85 dBf) was needed to obtain distortion readings under 0.2 percent. The tuner noise levels were low, −81 dB in mono and −73 dB or better in stereo.

Tuner channel separation was better than 46 dB in the midrange, falling to 26 dB at 30 Hz and 30 dB at 15,000 Hz. The frequency response was flat to 10,000 Hz but dropped off by 2 dB at 15,000 Hz (within the specification of −3 dB, however). The capture ratio of 1.15 dB was excellent, as were the 65-dB AM rejection and 70-dB alternate-channel selectivity. Only image rejection (42 dB) was substandard, although the same has been true of almost every receiver we have tested in recent years. The AM frequency response was typically narrow, measuring from +1 to −6 dB over the range of 60 to 2,700 Hz.

FEATURES

- ☐ Digital frequency-synthesis AM/FM tuner with thirty station presets in three banks
- ☐ Preset scan
- ☐ Independent power amplifiers for five channels (stereo main, rear surround, center front)
- ☐ Adjustable digital delay for spatial enhancement
- ☐ Dolby Pro Logic decoding
- ☐ Hall and Stadium stereo enhancement modes
- ☐ Simulated stereo for mono programs
- ☐ Thermal tunnel to cool output transistors silently
- ☐ Inputs for CD, phono, two tape decks, two VCR's, videodisc player
- ☐ CD DIRECT switch to bypass signal-processing circuitry
- ☐ Dubbing from VDP or VCR2 to VCR1 or from any audio source to TAPE1
- ☐ Video output to monitor
- ☐ Coaxial FM inputs for external antenna and cable
- ☐ Bass, midrange, and treble tone controls
- ☐ External-processor jacks
- ☐ Connections for two pairs of front speakers
- ☐ Center-channel speaker output; separate output for external center-channel amplifier
- ☐ Phantom center-channel setting for use without center speaker
- ☐ Remote control for major functions of receiver and compatible Marantz turntable and tape deck
- ☐ Black or gold finish with rosewood side panels

LABORATORY MEASUREMENTS

☐ **Tuner Section** (all figures for FM only except frequency response; measurements in microvolts, or μV, referred to 300-ohm input)

Usable sensitivity: mono, 11.5 dBf (2.1 μV)
50-dB quieting sensitivity: mono, 14.2 dBf (2.8 μV); stereo, 38 dBf (43.7 μV)
Signal-to-noise ratio at 65 dBf: mono, 81 dB; stereo, 73 dB (75 dB at 85 dBf)
Harmonic distortion (THD + noise) at 65 dBf: mono, 0.12%; stereo, 0.47% (0.19% at 85 dBf)
Capture ratio at 65 dBf: 1.15 dB
AM rejection: 65 dB
Selectivity: alternate-channel, 70 dB; adjacent-channel, 6.5 dB
Stereo threshold: 27 dBf (38 μV)
Pilot and subcarrier leakage: 19 kHz, −75 dB; 38 kHz, −63 dB
Hum: less than −80 dB
Stereo channel separation at 100, 1,000, and 10,000 Hz: 36, 46.5, 36 dB
Frequency response: FM, +0.2, −2 dB from 30 to 15,000 Hz; AM, +1, −6 dB, 60 to 2,700 Hz

☐ **Amplifier Section**

1,000-Hz output power at clipping: 178 watts into 8 ohms, 260 watts into 4 ohms, 158 watts into 4 ohms with switch set to 4 ohms (see text)
Clipping headroom (relative to rated output): 1.54 dB
Dynamic power output: 225 watts into 8 ohms, 365 watts into 4 ohms, 190 watts into 4 ohms (switch set to 4 ohms), 305 watts into 2 ohms (switch set to 4 ohms)
Dynamic headroom: 2.55 dB
Maximum distortion (20 to 20,000 Hz into 8 ohms): 0.11% at 20,000 Hz and 125 watts output
Sensitivity (for a 1-watt output into 8 ohms): CD, 16 mV; phono, 0.2 mV
A-weighted noise (referred to a 1-watt output): CD, −80.5 dB; phono, −75 dB
Phono-input overload: 74 to 83 mV from 20 to 20,000 Hz
Phono-input impedance: 52,000 ohms in parallel with 175 pF
Tone-control range: 100 Hz, +6, −7 dB; 1,500 Hz, +7, −6 dB; 10,000 Hz, +8, −7 dB
Loudness-contour range: 50 Hz, +8 dB; 15,000 Hz, +6 dB

Comments

Our tests of the Marantz RS 3559 left no doubt of its overall excellence. In most of the characteristics that should really matter to a typical user, it was difficult to fault. Certainly its operating versatility and output power left nothing to be desired.

The thermal tunnel cooling system, of which Marantz is justifiably proud, makes this powerful receiver truly practical for a home installation. Most other audio system components will probably run hotter than the conservatively rated RS 3559, which is able to supply hundreds of clean watts to a battery of speakers without strain or risk of damage. Very few fan-cooled stereo components are really suitable for use in a typical home, since the fan noise can usually be heard above the totally quiet background of a digital recording. Not so with the RS 3559—we couldn't hear anything from it even with an ear pressed to the top grille, directly over the fan (which we could see turning).

Another very welcome feature of the RS 3559 is its control simplification. I find the panel complexity (and attendant poor visibility) of most full-featured receivers to be an annoyance. No matter how complete and versatile a receiver may be, most of its controls and special functions will be used rarely, if at all, by the average person. Nevertheless, the panel is often cluttered

with minor controls to the point where the unit's proper functioning is impaired. Although I am not exactly an average user of such equipment, I am bothered by this sort of poor ergonomic design—especially because, as the RS 3559 shows, it is unnecessary.

Hiding little-used controls behind a hinged door or panel is an idea that has been used by many manufacturers, but I think Marantz has gone beyond that basic step in the RS 3559. The main, unhidden controls are distinctively styled and supremely functional. Along with the excellent display, they tell the user everything he needs to know about the operation and status of the receiver.

On the other hand, the control density *behind* the hinged panel is about as tight as it could possibly be. Recessed as they are, the buttons (and their markings) are not easily seen and used unless the receiver is at eye level. But even here, the RS 3559 showed evidence of its designers' thoroughness.

The fifteen or so buttons associated with the surround-sound setup procedures are duplicated on the remote-control handset. This is desirable in any case since setting the levels of the five speakers used in a full Dolby Pro Logic setup should be done at an actual listening location. Most of the hidden controls on the receiver, therefore, need not be used at all once the system has been set up properly. Moreover, the remote control was exceptionally powerful—it could be pointed anywhere in the room without losing contact with the receiver.

Our test receiver was the gold-finished version. Although aesthetics are generally outside the scope of these reviews, I must say that it was one of the handsomest hi-fi products I have used. And though I was unable to evaluate the receiver's performance in a full Dolby Pro Logic setup, its stereo (and even mono) ambience-enhancement systems worked very well. Simply as a stereo receiver, the RS 3559 left little to be desired. From its low noise level to the smoothness and positive feel of its controls, it sounded and felt as good as it looked.

Circle 142 on reader service card

JOON P. LEUNG

PINNACLE PN8+ SPEAKER SYSTEM

Julian Hirsch, Hirsch-Houck Laboratories

PINNACLE'S inexpensive and compact loudspeakers feature the company's patented Diaduct venting system, which was developed to solve the problem of fitting a duct tube of the required length and diameter for a given low-frequency response limit into a box of small size and attractive proportions. The depth of a typical speaker enclosure limits the maximum length of a conventional duct to the distance between the front and rear panels (bending the duct can introduce undesirable air turbulence). A short duct, however, must be relatively small in diameter and port-opening area for correct box tuning, reducing the system's low-frequency output capability.

The Diaduct system uses an internal tube installed at an angle to achieve the longest possible acoustic path for a box of given size. In addition, the port is elliptical, rather than circular, to increase its area. The result is a deeper bass response than could otherwise be realized from the same driver in an enclosure of the same size.

Pinnacle's design goals are to achieve high sound quality from small, affordable speakers. In our review of the company's first speaker, the PN5+, in January 1988, we commented on its smooth, uncolored sound, which was comparable to that of far more expensive speakers. The line has grown since then to five full-range two-way speakers and a subwoofer. This time we tested the top-of-the-line PN8+.

The PN8+'s 8-inch woofer operates in a fourth-order vented enclosure. It has two Diaduct tubes, both opening on the front panel. The woofer cone, formed of mineral-filled polypropylene, has a 1½-inch voice coil and a butyl surround. There is a first-order (6-dB-per-