Yamaha

Soavo-1 Loudspeakers

The audio industry presents the con-

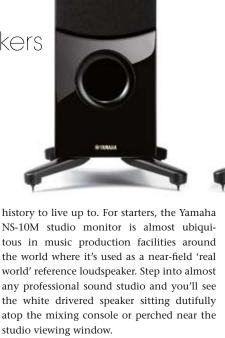
sumer with a staggering over-abundance of choice when it comes to loudspeakers. There are products to fit any budget, from the entry level to the if-you-need-to-ask products that cost as much as a new German or Italian sports car. And whereas many high-profile manufacturers specialise-purely and solelyin the production of loudspeakers, Yamaha on the other hand, has a portfolio of products that spans the full gamut of audio reproduction... and I mean the full gamut; it's a threelink chain that encompasses the instruments that create music, through the studio equipment used to craft and produce the musical work of art, to the playback equipment that reproduces the music that inspires us and enriches our lives.

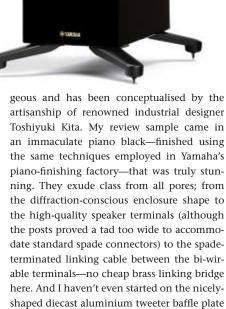
I have personally been witness to and experienced all three 'links' of this chain. Most recently, I had the pleasure of visiting Japan as a guest of Yamaha and was witness to the extraordinary attention to detail and the meticulous-almost fanatical-precision demonstrated in the manufacturing processes of the company's superb musical instruments, including pianos, woodwind instruments, and others.

Having said that, the electronics giant has expended considerable research and development resources in the creation of its latest flagship speaker products. The culmination of this engineering effort has resulted in the Soavo range of speakers. I decided I should start at the top by investigating the performance of the most expensive speakers in Yamaha's range, the Soavo-1s.

The Equipment

Being the Yamaha flagship speaker product, the new Soavo-1 has a considerable legacy and





and the drivers themselves. Actually, let's start on them.

Yamaha says it designed this set of advanced-technology drivers from the ground up. The tweeter is an aluminium dome which the company labels as a 'DC-Diaphragm' design. This is basically a topology that physically integrates the tweeter's actual dome area with the voice coil. The tweeter sits flush on a dedicated cast aluminium baffle plate. The plate aids in the reduction and isolation of resonances and, as an added bonus, looks terrific as a visual contrast to the black finish. A neodymium magnet is used to power the driver.

The 'Advanced Polymer Mica Diaphragm' (A-PMD) 130mm midrange driver is another clever piece of engineering. The diaphragm

NS-10M studio monitor is almost ubiquitous in music production facilities around the world where it's used as a near-field 'real world' reference loudspeaker. Step into almost any professional sound studio and you'll see the white drivered speaker sitting dutifully atop the mixing console or perched near the studio viewing window.

Secondly, the Yamaha NS-1000 speaker from the 1970s is regarded by most audio cognoscenti as one of the very best speakers of that era (and beyond) and is widely regarded as an out-and-out classic. Decades ahead of its time, Yamaha produced the first commercially-available speakers sporting beryllium tweeters and dome midrange drivers. Sadly, Yamaha stopped production of the classic NS-1000 a few years after. Only relatively recently—due to the complexities and health issues involved in its production—has the prized material resurfaced as a superbly suitable conduit for speaker drivers, and still there is only a handful of manufacturers that have the resources and capabilities to produce them.

By the way, according to those I spoke to at Yamaha, Soavo is an acronym made up from the Italian 'soave' meaning soft, and 'voce' meaning voice, the intention being to describe a natural-sounding speaker.

Back to the Soavo-1, then. Let's just say it at the outset; this speaker is drop-dead gor-

esoterica

material is very light and stiff—for a fast response time—and has low inherent resonance for potentially natural sound. The spider system is said to be just as advanced and has been designed by the famous speaker driver engineer Kurt Müller. Again, a powerful neodymium magnet motor is used.

Bass duties are relegated to two 165mm A-PMD cones. These cones have massive magnet structures and diecast aluminium baskets with spider systems once again designed by Herr Müller.

Attention has been paid to the crossover network by way of high quality componentry (including Solen capacitors) and point-topoint soldering of individual components.

Yamaha's rich history in piano manufacturing has had a dramatic influence on the cabinetry used in the whole Soavo Series. The Soavo-1's enclosure measures 1051×349×487mm (HWD) and weighs in at 27kg. It's not only visually beautiful but is also very cleverly engineered as well. The cabinet has been tapered and faceted at tweeter level in order to control diffraction effects and the non-parallel walls (even the cabinet's top is slanted downwards) help minimise internal standing waves. A large and craftily-sculpted-from-solid-wood port exits the enclosure towards the front, and finally, four cast aluminium pedestal supports-with rubber feet and spike sockets-help stabilise the whole shebang.

The Soavo-1's frequency response is quoted by Yamaha as extending from 35Hz to 50kHz – 10dB. Impedance is specified at a very friendly 6Ω and sensitivity is spec'd at 89dB/2.83V/M. This should make for a relatively easy load for any quality amplifier... including low-wattage SET valve types.

Listening Impressions

After a few hours 'conditioning' at moderate levels (these particular units had already had an extensive break-in period at Yamaha's Australian head office before being sent to me for review), I threw the Soavo-1s in the deep end.

Out came French/African percussionist Mino Cinelu's woofer-thrashing self-titled CD. *Shibumi Dunes* is a killer track that builds from an atmospheric... almost ambient... feel to a powerful theme of massive sporadic drumming. The CD is superbly produced and the drums are closely-miked. What's more, Mino really knows how to whack those skins.

Wimpy speakers need not apply. The Soavo-1s coped without stress, punching-out superbly detailed, full and powerful bass tones that belied the enclosures' modest size. The twin 165mm bass drivers are really quite capable of mixing it with the bigger boys, their only real limitation being in the reproduction of that last, lowest, octave. This CD dips well down into the low 30s and the Soavos foreshortened the lowest lows, albeit truly excelling in the rest of the bass register.

Coming fresh from a review of one of the best-imaging speakers this writer has ever experienced (Dynaudio's Confidence C4s) meant the Soavo-1s, in that respect, had a hard act to follow. But there was no need to worry in this department either. Although the images projected into the room weren't as detached and as laterally far-reaching as my previous (four-times-the-price) listen, the Soavos still presented a wide and rather deep soundstage with very good image focus and specificity.

The Soavo-1s are very smooth and easy performers in the all-important midrange frequencies. Some speakers tend to have a bit of a frequency rise in the mid to upper midrange resulting in subtly-enhanced detail within that range and also projecting vocals a little 'forward'. The downside to such a balance is that brightly-produced recordings can sound brash and even bright, especially so on vocal sibilants. The Soavo-1s don't suffer this imbalance; in fact the overall midrange is a tad laid-back. And apart from making the speaker much more forgiving of a bad or harsh production, it also presents other noteworthy sonic implications.

On the one hand there's the subtle impression of stunted dynamic contrasts and a laid-back presentation but on the other hand, the soundstage takes on a deeper perspective with instruments being placed further towards the back wall. What's more, music via the Soavols tends to sound very natural and 3D-spacious—mostly due to that superb depth perspective. Here the speaker really lives up to its acronym-derived name.

Moving-on up to the top-end we find this little marvel of a tweeter. It may be the tweeter's 'DC-Diaphragm', or the solidity of the aluminium mounting plate, or even the lack of enclosure contribution... whatever... but this is one sweet, delicate and sophisticated driver. I found the highs to be superbly detailed, ut-

LAB REPORT

Readers interested in a full technical appraisal of the performance of the Yamaha Soavo-1 Loudspeakers should continue on and read the LABORA-TORY REPORT published on the following pages. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

terly extended and totally grain- and tizz-free. Cymbals and bells took on a shimmer and verisimilitude that was on par with, or better than, many more expensive speakers I've heard. Some tweeters (fewer these days) tend to homogenise their output. Not the Soavo's tweeters. Here there was a subtlety and sense of differentiation and separation between the size, tone and strike force of cymbals—and even the top register of female vocals—that was quite remarkable. These Yamaha tweeters—in this application—won't be shamed by far more expensive, fancy and fashionable drivers... even those using exotic beryllium and diamond diaphragms.

Conclusion

The Soavo-1 is a speaker with solid acoustic design principles applied to a totally stunning form factor. Yamaha has dedicated considerable resources to the engineering of the drivers, the functional yet beautiful design of the cabinets and the extraordinary piano-inspired finish. Sonically, the speakers excel in their reproduction of all manner of music.

And here's where the question begs... does the Soavo-1 have the makings of another classic Yamaha speaker? Well, let's just say that the revered NS-1000 has an august and worthy successor... — Legar Kramer

Yamaha Soavo-1 Loudspeakers

Brand: Yamaha **Model:** Soavo-1

Category: Loudspeakers

RRP: \$5,499

Warranty: Five Years

Distributor: Yamaha Music Australia Pty Ltd **Address:** Level 1,99 Queensbridge St

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Laboratory Test Report

The frequency response of Yamaha's Soavo-1 as shown in *Graph 1* extends from 50Hz to 10kHz ±3dB when using pink noise as the test stimulus. This is an excellent result. This trace is the averaged result of nine individual frequency sweeps measured at three metres, with the central grid point on-axis with the tweeter. Although the capture is unsmoothed, some smoothing is inevitable as a part of this averaging process. Overall, the graph shows superb flatness right across the midrange, so that it's within just ±1dB from around 300Hz all the way up to 2kHz, which is the note 'C7' in the top octave of a piano keyboard. Below this you can see there is a slight 'lift' in the bass between 80 and 240Hz that peaks at around +3dB at 150Hz. There's also a very slight prominence in the high treble, between 4kHz and 10kHz (the latter frequency being the upper measurement limit for this particular test), but since it's only around +1dB and could affect only the harmonics of instruments, and not their fundamentals, I don't think it would be audible.

Graph 2, which shows the high-frequency response in far greater detail, thanks to the use of the gated sine wave technique, shows that the rise in output level above 4kHz increases to about 4dB at 6–7kHz, after which it rolls off, shelves slightly, then rolls off to end in a sharp –8dB dip at 15kHz after which there's a rise to a +10dB peak at 30kHz. This 30kHz peak would be the fundamental resonance of the aluminium dome, but at this frequency it's high enough to be well out of harm's way, where it would be completely inaudible to the human ear. And severe though that suck-out at 15kHz seems to the human eye, it has such a high 'Q'—occurs over such a narrow bandwidth—that it, too, would be inaudible to the human ear, not least because few—if any—people over the age of 40 can hear a 15kHz tone.

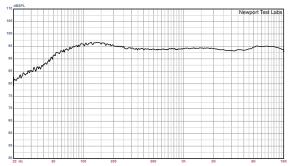
Low-frequency performance is shown in *Graph 3*, which was measured using the standard near-field microphone technique. You can see that the Soavo-1 is tuned to a very low frequency (32Hz) and that the woofers (the single trace is the summed version of both bass drivers) roll off very smoothly from around 150Hz down to this frequency. The port's output peaks a little higher than I might have expected given this tuning, at around 40Hz. The port nonetheless produces significant energy over quite an extended bandwidth, as its output is 6dB down at 23Hz and 80Hz, so it's able to substantially reinforce the output from the bass drivers.

Impedance was controlled, except that the lower resonant bass peak is moderately high at well over 40Ω and the upper resonant peak also comes in at a fairly high 34Ω (at 54Hz). You can see the 'saddle' between the two is at 32Hz, electrically confirming the system tuning. The variation in impedance between the two peaks is confirmation that Yamaha's engineers have deliberately tuned the Soavo-1's port a little high. The impedance of the Soavo-1 drops to around 3.2Ω at 160Hz, and there's a difficult point in the impedance around 85Hz, where the impedance is 5.4Ω and the phase angle is -63° , which means any amplifier used with the Soavo-1 will need to be capable of delivering its rated power output into a 4Ω load. However, it does mean that the Soavo-1 should be rated as 'nominally' 4Ω rather than the 6Ω specified by Yamaha.

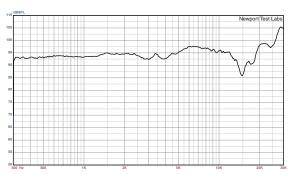
The amplifier you use to drive the Soavo-1s won't have to be overly powerful in order to achieve high sound pressure levels in your listening room, because *Newport Test Labs* measured the Soavo-1's sensitivity at 89.5dBSPL at one metre, for a 2.83Veq input, which is both very good (being significantly higher than the average for all speakers) and also a fraction higher than Yamaha's own specification. It's also a good result because *Newport Test Labs'* methodology for testing loudspeaker efficiency is particularly stringent.

The last graph in this series is a composite plot showing how the various drivers interact with each other to produce the complete 'system' response as measured by *Newport Test Labs* of 40Hz to $20 \text{kHz} \pm 6 \text{dB}$. Looking at the left-hand side of this graph, it's apparent that the particular loading and alignment used by Yamaha means that although the frequency response is -3 dB at 50 Hz, the roll-off below this point is a little shallower than I might have expected, so you can expect to hear significant bass output down to around 30 Hz, particularly if you position the speakers effectively in your room.

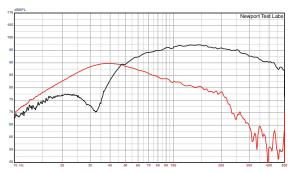
Overall, this is an excellent set of test results, showing that Yamaha's engineers have created a very musically balanced loudspeaker in the Soavo-1. —\show Steve Holding



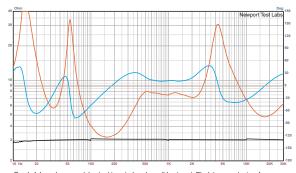
Graph 1. Averaged frequency response using pink noise test stimulus with capture unsmoothed and band-limited to 10kHz. Trace is the averaged result of nine individual frequency sweeps measured at three metres, with the central grid point on-axis with the tweeter. [Yamaha Soavo-1]



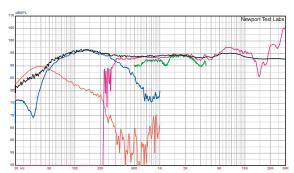
Graph 2. High-frequency response, expanded view. Test stimulus gated sine. Microphone placed at three metres on-axis with dome tweeter. Lower measurement limit 300Hz. [Yamaha Soavo-1]



Graph 3. Low frequency response of front-firing bass reflex port (red trace) and woofer. Nearfiel acquisition. Port/woofer levels not compensated for diff. in radiating areas. [Yamaha Soavo-1]



Graph 4. Impedance modulus (red trace) plus phase (blue trace). Black trace under is reference 3-ohm precision calibration resistor. [Yamaha Soavo-1 Loudspeaker]



Graph 5. Composite response plot. Red trace is output of bass reflex port. Dark blue trace is anechoic response of bass driver. Pink trace is gated (simulated anechoic) high-frequency response. Green trace is section of near-field response of midrange driver. Black trace is averaged in-room pink noise response (ext version of Graph 1). [Yamaha Soavo-1Loudspeaker]