



# YAMAHA SOAVO NS-F901 LOUDSPEAKERS

**T**he audio industry is heavily peppered with niche boutique manufacturers that aim at the top tier of performance, build and design. These are often somewhat more obscure, exclusive brands that enthusiasts—or even *cognoscenti*—embrace for a number of reasons.

Some of these reasons, amongst others, are tied to the idea of buying into a single designer's vision—with its potential for performance benefits—and/or the exclusiv-

ity factor of acquiring a niche item with prestigious cachet. But what happens when a large, well-known multinational manufacturer—in this case the largest and best-known music company in the world—enters that niche with a worthy product... one that is the fruit of a massive and hugely expensive and research and development project? Yamaha's Soavo NS-F901 loudspeakers happen; that's what!

## SUBTLE EVOLUTION?

Yamaha's Soavo speaker range has represented the company's best for a number of years, during which time accolades have been deservedly bestowed on a product with bespoke proprietary high-quality drivers, an outstanding level of fit and finish and, of course, superb sonic performance (this writer had the pleasure of reviewing one of the first generation of Soavo speakers, the Soavo-1, 'way back in 2009). Now with new refinements the second generation of Soavo loudspeakers has hit the market, the flagship of which is the speaker reviewed here.

Externally, the new speaker has subtly changed, with the metal outrigger extension feet giving way to a subtly elevating plinth terminated via the provision of either rubber feet or a set of metal spikes. The same superb finish is carried through to

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the new speakers, with expertise derived from Yamaha's renowned piano-finishing division. Further, the collaboration between the speaker design team and the musical instrument division now extends to the latter providing some input into the sonic signature of the NS-F901s. The svelte, faceted and well-braced enclosure, with its aluminium top baffle section, is still one of the most attractive designs in speakerdom. In fact, the look was conceived by award-winning industrial designer Toshiyuki Kita.

The three-way four driver configuration is the same as the outgoing model with refinements having been applied to the drivers. A 25mm-diameter aluminium tweeter with a neodymium magnet system resides on the aforementioned aluminium plate which provides a solid mounting point and eliminates unwanted resonances. A new array of midrange and bass drivers is now offered with the high-power midrange unit featuring a 130mm-diameter A-PMD (Advanced Polymer-injected Mica Diaphragm) cone with a large neodymium magnet system and an aluminium die-cast basket. Germany's renowned Kurt Müller manufactures the ultra-linear spider.

The upgraded twin 165mm-diameter bass drivers are powered via a large ferrite magnet and feature aluminium die-cast baskets and rubber roll surrounds. The output from the rear of the bass drivers is vented through a large, sculpted, wooden bass reflex port that's mounted in the front baffle.

Equal care has been applied to the crossover, which features high-quality parts, including Solen capacitors, and is the result of extensive listening sessions by the talented design team at Yamaha headed by Masahiro Tobise. The high-quality gold-plated bi-wiring speaker terminals are linked via purpose-made spade-terminated cable links rather than the ubiquitous—but lesser-quality—metal bars.

Yamaha quotes a frequency range only (32Hz to 50kHz) rather than a response (which would add a  $\pm$ dB envelope), an efficiency of 89dB SPL/2.83V/1m and a nominal impedance of 6 $\Omega$ . Crossover frequencies are stated as 450Hz and 3.5kHz. The 30.7kg enclosure stands 1060mm high and is 270mm wide and 425mm deep.

A final reiteration on the aesthetic aspects; the NS-F901 speakers are among the best-finished and most attractive designs I've

seen. They're also one of the few loudspeakers that come with a ten-year guarantee.

### GRACEFUL VOICE

Firing up these beauties brought back memories of their predecessors. Still there in abundance were the phenomenal bass power and soundstaging/imaging qualities of the Soavo-1. In terms of bass the new speaker dips a tad lower and expands the bass frequencies' dynamic expression while maintaining the same dexterity and fluidity (that rhythmic 'bounce'). Playing Nils Lofgren's *Live 2003* album, the track *Bass & Drum Intro* through the NS-F901 is a lesson in dynamics and bass tautness. Feed these speakers with a powerful amplifier and you'd associate the bass punch and authority with larger drivers in a bigger box.

The new tweeter is a rather special driver (something I also mentioned in the previous review) and, although the span of time is 'way too long for any accurate comparative reminiscence, there would seem to be developments in detail and tonality. The new driver is as open, delicate and nuanced as you could wish for—at any price. Sera Una Noche's *Nublado* features a number of bells and percussive sounds that I have been using as reference material for some time now. I am intimately familiar with the high-frequency reverberations and decays in this recording and the NS-F901s reproduced these with arresting verisimilitude. Also of note is the seamless integration between high and midrange drivers—testament to the quality of the drivers themselves as well as the engineers' skills in melding the two via their crossover design.


The quality of the midrange driver also displays itself with any complex material. The speakers resolve profound detail while excelling at separating musical strands. Dynamic shading is also a strong point here, with vocals soaring when called to while all the subtleties of expression and minutiae of inflection are bared to the ear.

A narrow baffle at the level of the tweeter has always paid dividends for designers looking to maximise a dispersion pattern that, in conjunction with quality drive units and a competently-designed crossover, is conducive to the reproduction of a wide soundstage and accurate imaging. The cut profile of the NS-F901's narrow upper baffle allows images to 'float' along different planes of depth

within a very wide soundstage. I listened to the Yamaha Soavo NS-F901s with very exotic ancillary electronics and the speakers scaled the performance accordingly without revealing inherent shortcomings. This is a testament to the quality of the drivers and the overall design integrity.

### CONCLUSION

Having made remarkable contributions to the high-end landscape in the '70s and '80s, Yamaha the powerhouse went on somewhat of a hiatus, focusing its energies into then-booming areas such as home theatre. Over the past few years the company has relocated itself in the high-end audio space—via a dedicated team of talented and passionate engineers—with a number of products that secure firm ground for this most 'musically' versatile of Japanese multinationals.

So Yamaha is back in high-end audio and the NS-F901 is a fitting beacon. It's a package that combines outstanding bespoke driver engineering, flawless fit and finish and extraordinary sonic performance. These speakers deserve to join the venerable Yamaha NS-1000s in high-fidelity's 'Hall of Fame'.  **Edgar Kramer**

### YAMAHA SOAVO NS-F901 LOUDSPEAKERS

**Brand:** Yamaha  
**Model:** NS-F901  
**Category:** Floor-standing Loudspeakers  
**RRP:** \$5,999  
**Warranty:** Ten Years  
**Distributor:** Yamaha Music Australia Pty Ltd  
**Address:** Level 1, 99 Queensbridge Street Southbank VIC 3006  
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Demand high-quality electronics beyond its price point

LAB REPORT: Turn to page 82  
Test results apply to review sample only.

## LABORATORY TEST RESULTS

Graph 1 tells you the most important thing you really need to know about the Yamaha Soavo NS-F901 loudspeaker: its frequency response is flat... really flat. Yes, this response was obtained by using a pink noise test stimulus that necessarily involves some averaging, but no more averaging than is done automatically by the human ear. You can see for yourself that from about 180Hz

Newport Test Labs it presents as being quite gradual, so it's only 5dB down at 17kHz (which is above the limit of hearing for most males over the age of 30, so not overly significant then) then 10dB down at 20kHz.

Low-frequency performance is shown in Graph 3, with separate acquisitions for the bass drivers (though only one of the two is shown—as the black trace—as the other was virtually identical) and the

midrange driver (the pink trace). The output of the bass reflex port (the red trace) shows its output peaks at 40Hz, though it's not so much of a 'peak', since output is maintained within 6dB over the range from around 22Hz to around 75Hz. The port's high-frequency output rolls off fairly smoothly, though there's a shelf at 200Hz and some unwanted output up around 600–800Hz. The bass drivers' low-frequency output rolls off below 100Hz to a minima at 32Hz. The bass drivers' response is obviously rolled-off by the crossover above 200Hz to make room for the midrange driver, whose output starts making itself audible at around 400Hz.

The impedance of the Yamaha Soavo NS-F901 is nicely tailored, but drops down below  $3.5\Omega$  at around 150Hz, so the nominal impedance would be  $4\Omega$  even though almost everywhere else the modulus makes it look more like an  $8\Omega$  design. Yamaha specs it at  $6\Omega$ , so I guess it's put a 'real-world' number in the box that accurately represents how it will look to most amplifiers, though it's not strictly in accordance with the guidelines published in IEC 268-5.16.1. The impedance has been tailored to rise above 10kHz, which shows excellent design nous and means the speakers will be very amplifier-friendly. The 'saddle' at 33Hz between the two impedance peaks (the one at 17Hz reaching  $40\Omega$  and the one at 59Hz reaching  $33\Omega$ ) means you shouldn't expect too much output below this frequency. There are a few 'wrinkles' on the impedance trace that suggest the presence of some minor resonances at 200Hz and 800–900Hz. The high-pass/low-pass sections of the crossover show an electrical crossover at 500Hz. (Yamaha puts the acoustic crossover at 450Hz).

The trace shown in Graph 5 is actually two traces that have been spliced together via post-processing. Below the splice point (650Hz) the trace is the averaged result of nine individual frequency sweeps measured at three metres, with the central grid point on-axis with the tweeter using pink noise test stimulus with capture unsmoothed, a more complete version of which is shown in Graph 1. Above 650Hz the response is the anechoic high-frequency response, an expanded view of which

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*Phenomenal bass power and soundstaging/imaging qualities were there in abundance...*

up to 10kHz (the upper graphing limit in this case... the loudspeaker's high-frequency performance is shown in greater detail in Graph 2), the response is within about  $\pm 1\text{dB}$ . Below 180Hz there's a slight rise in the frequency response, but only to the extent of 2.5dB, followed by a return to reference at 45Hz and then a gradual roll-off to a much lower—but still useful—output right down at 20Hz.


High-frequency performance is shown in Graph 2, with the red trace showing the frequency response with the Soavo's grille fitted and the black trace the frequency response without it. It would appear to me that all the listening sessions by the designers were conducted without the grille, because it is in this mode that the Soavo NS-F901 delivers its best performance: very smooth up to 10kHz and, although it rolls off smoothly above 10kHz, the roll-off is smoothest when the grille is absent. The red trace shows the grille introduces a near-5dB dip between 3 and 4kHz, a 2.5dB peak between 4.5 and 6kHz, and around a 5dB suck-out at 7kHz. There's also a 2.5dB difference in level between the two traces between about 12kHz and 15kHz. So when you're listening seriously, I'd suggest losing the grilles for the duration of the listening session, then re-attaching them afterwards. For casual listening, you could leave the grilles in position. As for that roll-off, as measured by

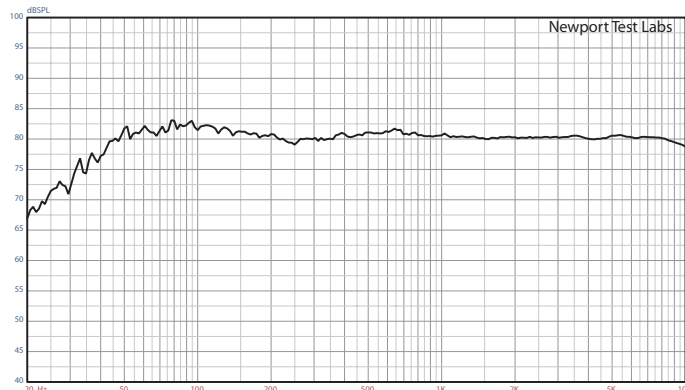


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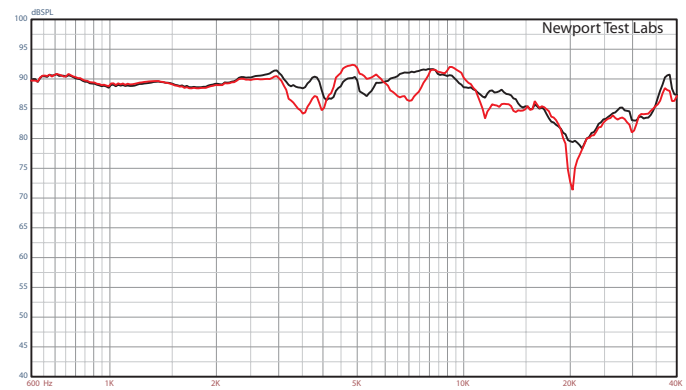
is shown in Graph 2. Graph 6 is another 'post-processed' graph that superimposes the various different traces to show how the drivers and port interact. *Newport Test Labs* measured the sensitivity of the Yamaha Soavo NS-F901 as being 88dB SPL under its normal stringent test conditions. This is only just a little lower than Yamaha's specifica-

tion of 89dB SPL/w/m, which would seem to suggest that the two are employing similar test methodologies. It's higher than average and means that, when read in conjunction with the impedance modulus, the Yamaha Soavo NS-F901 will be easy to drive for any amplifier, plus you won't need a whole lot of watts to get the best from them.

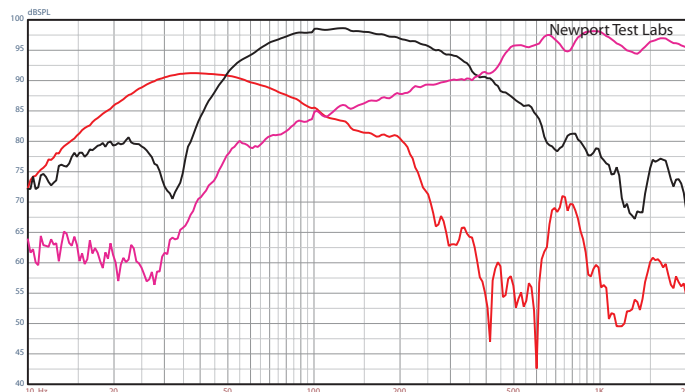
Yamaha's Soavo NS-F901s are a classic example of text-book speaker design and as a result returned an outstanding set of measurements throughout *Newport Test Labs'* tests, most especially in respect of the flatness and linearity of their frequency response.  **Steve Holding**



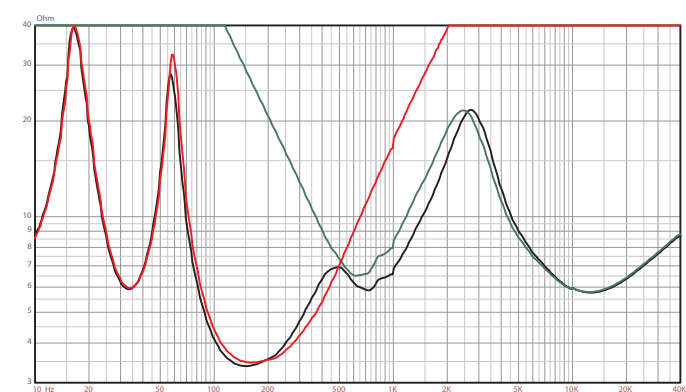
Graph 1. Averaged frequency response using pink noise test stimulus with capture unsmoothed. Trace is the averaged result of nine individual frequency sweeps measured at three metres, with the central grid point on-axis with the tweeter. [Yamaha Soavo NS-F901]



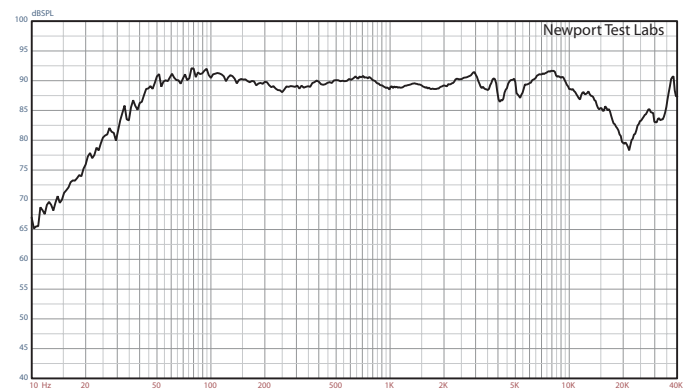
Graph 2. High-frequency response, expanded view. Test stimulus gated sine. Microphone placed at three metres on-axis with dome tweeter. Grille on (red trace) vs grille off (black trace) Lower measurement limit 600Hz. [Yamaha Soavo NS-F901 Loudspeaker]



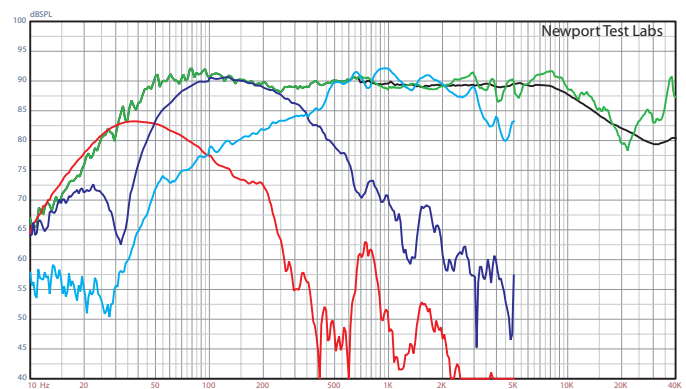
Graph 3. Low frequency response of front-firing bass reflex port (red trace), woofer (black trace) and midrange driver (pink trace). Nearfield acquisition. Port/woofer levels not compensated for differences in radiating areas. [Yamaha Soavo NS-F901 Loudspeaker]



Graph 4. Impedance modulus (black trace), plus high-pass section of crossover (green trace) and low-pass section (red trace). [Yamaha Soavo NS-F901 Loudspeaker]



Graph 5. Frequency response. Trace below 650Hz is the averaged result of nine individual frequency sweeps measured at three metres, with the central grid point on-axis with the tweeter using pink noise test stimulus with capture unsmoothed. This has been manually spliced (at 650Hz) to the gated on-axis high-frequency response, an expanded view of which is shown in Graph 2. [Yamaha Soavo NS-F901 Loudspeaker]



Graph 6. Composite response plot. Red trace is output of bass reflex port. Dark blue trace is anechoic response of bass driver. Light blue trace is sine response of midrange driver. Green trace above 670Hz is anechoic response, below is in-room averaged pink noise response. Black trace is h.f. averaged in-room pink noise response. [Yamaha NS-F901]



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