YG Acoustics Sonja 2.2 Loudspeaker

Serving the Music

Kirk Midtskog

Rarely does a high-end manufacturer make a new product available for review well in advance of its official release. Usually a new product is announced at an audio show like Munich High End, and its market delivery is targeted for several months after the announcement. Yoav Geva, principal designer at YG Acoustics, was way ahead of schedule in the case of the Sonja 2.2. He and his manufacturing team were able to make an advanced production pair available exclusively to TAS several months before the speaker's official release, scheduled—as of this writing—for sometime in December, 2017, most likely at special showings hosted by YG and Bill Parish at GTT Audio.

I reviewed the original Sonja 1.2 in Issue 256. As good as that speaker still is, the new 2.2 is better in some significant ways. I will cover the engineering changes that are responsible for the increased performance later—such as a brand-new kind of dome tweeter—but let me summarize the primary sonic improvements as follows: higher resolution of fine detail coupled with an increase in overall "ease," a bit more bass heft, better definition of complex musical lines during demanding musical passages, and an expanded and more continuously rendered soundstage such that the speakers blend into the soundscape even more seamlessly than before. I didn't believe such improvements were possible to the extent YG has wrought, given the 1.2's already outstanding performance, but the company has indeed done just that. The Sonja 2.2 is worthy of serious consideration for anyone in the market at its $76,800 price level—and even higher, for that matter.

This price segment of the market has been filling up with more products for some time now, and the upper end pricing is rising even further. $500k+ speakers and $150k+ turntables are now well within price frontiers, just like $5 million Manhattan condos and $100k automobiles are not considered unusual anymore. I don't condone it, nor do I play at that those price levels, personally. I am merely characterizing what seems to be trend in the broader "luxury" market. Having said that, I do not believe the 2.2's $76,800 price is unduly elevated simply because others are doing it. YG designs and manufactures high-quality speakers in the U.S. where labor and other costs are higher than, say, Asia, and it makes the vast majority of its products' constituent parts at its factory just outside of Denver, Colorado. Driver membranes, cabinets, toroidal inductors, internal braces, joiners, and even custom binding posts are all manufactured in-house. YG uses high-grade raw materials for the parts it manufactures and top-quality parts from vendors such as Mundorf (capacitors and inductors) for the components it must source from others, all of which increase costs.

What are some of the other costs? YG machines the vast majority of its speakers from aircraft grade (6061-T651) aluminum billet—to a 20-micron (0.0008") tolerance in some applications. Many of the billets are large and heavy, so raw material stock and shipping costs are high. The various milling and turning machines needed to meet YG's capacity and exacting demands are expensive, over $2 million combined thus far. The costs of the skilled labor to program and maintain the CNC (computer numeric control) machines and the consumables (tool heads, bits, etc.) are considerable. YG machines driver cones from solid aluminum blocks, which it calls "BilletCore." Each BilletCore radially- and concentrically-ribbed driver cone takes about four hours to mill on a five-axis CNC milling and turning machine imported from Germany, a Gildemeister CTX Beta 1250 TC.

Background Technology

YG's principal defining technological difference lies in its crossovers and how they are implemented in a very tightly controlled interplay among the drivers and other

parts of the finished loudspeaker. Yoav Geva founded YG Acoustics based on this unique—as far as I know—crossover technology, which YG claims comes closer to a sort of ideal in multi-driver loudspeaker design than most others, simultaneously achieving near-zero relative phase and near-flat frequency response. Apparently, either frequency response or phase angle performance is usually sacrificed for the other in most other designs. Geva's "DualCoherent" crossover—based on an algorithm he developed from signal processing in a completely different application—serves as the basis from which the rest of YG's engineering follows. In order for the crossover to work as intended, though, a very high level of precision in all aspects of the design is required; hence, YG's emphasis on high-quality parts and attention to every detail in its engineering and manufacturing. It is also why YG uses so much machined aluminum. It has good strength-to-weight ratio, relatively high resistance to corrosion and high temperature, the ability to be made into a wide variety of custom shapes to precise tolerances, and ideal resonance-damping properties when properly constructed. (For more information about the company, please see the YG Acoustics section in *The Absolute Sound's Illustrated History of High-End Audio, Volume One: Loudspeakers* or read past YG reviews in TAS.)

Product Description

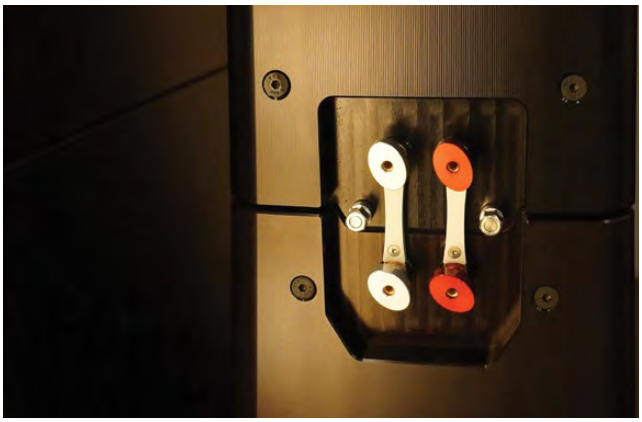
The only obvious visual difference between the Sonja 1 and 2 versions is in the rear panel binding post arrangement. Otherwise, the dimensions are the same, as are the number and sizes of the drivers and the configuration of the cabinet modules. For readers who are not familiar with the Sonja, the next two paragraphs are an edited description taken from my Sonja 1.2 review, updated to show the current Sonja 2.2 particulars and some additional details. (Readers who are already familiar with the speaker may want to skip the next two paragraphs.)

The Sonja 2.2 is a two-module design (main unit and bass unit) and is now available only as a fully passive system; the former powered bass module option is no longer offered. Consumers may opt for the Sonja 2.3, which adds a different bass module, bringing the price from $76,800 to $112,800. The three-module configuration increases the height from 51" to 70" and the weight from 271 to 481 pounds. The main, upper module houses two 6" aluminum BilletCore mid-woofers (unchanged), and a brand-new 1" waveguide-mounted "BilletDome" silk and airframe dome tweeter in a D'Appolito (MTM) arrangement. (I will cover more on this groundbreaking, patent-pending tweeter below.) The crossover point remains at 65Hz between the bass module and main module and at 1.75kHz between the mid/bass drivers and the tweeter. The two-way, 124-pound main, upper module (known as Sonja 2.1) can be purchased separately as a stand-mounted monitor (for $40,800) to which the bass module can be added later to form the three-way Sonja 2.2 system reviewed here. The 2.2 bass module has one BilletCore 10.25" driver, which is positioned

YG's new BilletDome soft-dome/frame tweeter represents a technical breakthrough for which the company is applying for a patent.

fairly low in its gently curved, tapered cabinet. YG found that this location maximized consistent bass performance through the driver's proximity to the floor, in addition to minimizing cabinet resonances.

Each module has an inner cabinet, which is mounted inside an outer cabinet. They are not merely double-layered as such. Each box has its own joints and can function as a stand-alone cabinet. This extra manufacturing complexity must surely add significantly to the overall cost, but YG says it makes each complete cabinet much more rigid and better damped than either an equivalently thick single-layered or a shared-joint, double-layered enclosure. Sonja 2, Sonja XV Jr., and XV (YG's $265,900 four-tower flagship) are the only models in the line with this cabinet-in-cabinet construction. The new BilletDome tweeter is also currently only available in Sonja models. YG does not use any batting or other soft materials inside its cabinets to dampen the drivers' backwaves. YG says such materials cause mechanical loss and degrade performance. All internal damping is handled by precise placement of braces and by an unspecified material in a proprietary method of pinpoint resonance control that YG calls FocusedElimi-



nation. Incidentally, the other speaker with which I am familiar that also does not contain soft internal damping material (or only a bare minimum of it), like those from Arabesque and Gamut, share a dynamic vibrancy with YG speakers.

New Version

The new Sonja 2.2 has three main changes (and one minor one) over the previous 1.2. First, and most significantly, all Sonja 2 models have a new kind of tweeter. Geva has merged a soft-dome membrane with a supporting lightweight, rigid, acoustically transparent frame made from—you guessed it—precision-machined aluminum billet. YG's new BilletDome soft-dome/frame tweeter actually represents a technical breakthrough in tweeter design for which the company is applying for a patent. Soft domes can sound very good, but they are simply not stiff enough to withstand the acceleration forces exerted on them while playing at higher frequencies and at higher amplitudes without deforming, resulting in distortion. Many metal-dome tweeters (regular or inverted) can also sound quite good and are generally stronger and more uniformly pistonic in their motion, but they are also known for "ringing" at high frequencies, thus creating unwanted resonances and a different sort of distortion. Even if the ringing can be shown to be above the limits of human hearing, many listeners can still discern a harshness in some speakers with metal tweeters, especially during demanding music passages. These are basic generalities, of course. I am leaving out other tweeter types, such as ribbons, electrostats, and magnetostats because I am simply not qualified to discuss them. (Ceramic and diamond-coated domes also have their pros and cons, but, again, I am not qualified to speak to them.) After nearly two years of R&D, Geva successfully bonded a high-quality silk dome membrane over a strong and very lightweight (30 milligrams) "airframe." This apparently makes the resulting tweeter stronger than the strongest all-metal tweeter but without a metallic ringing quality. YG has done acceleration tests (based on pressure measurements) of titanium and beryllium tweeters and can demonstrate that its BilletDome tweeter withstands about twice as many G-forces as a titanium tweeter and about 38% more than a beryllium one. The airframe is shaped to be acoustically transparent, very strong, and light enough so the that combined moving mass of the soft dome and its airframe are roughly equivalent to that of a metal dome. I will say, I have heard some great-sounding speakers with treated metal dome tweeters such as the upper-level Focal models—and I tend to be agnostic about specific materials in general—but the YG BilletDome tweeter sounds fabulous in the Sonja 2.2 and Sonja XV.

Second, the crossover was changed to accommodate the new tweeter's electrical and acoustic properties, and also to allow the speaker to perform more efficiently in the lower frequencies. YG says that rather than having the speaker favor mainly higher-powered, high-current amplifiers, a greater variety of amps can now extract more of the Sonja's available bass extension.

Third, the bass module cabinet is now 25 pounds lighter and also stiffer. According to YG, "the new construction is 8% lighter and over 10% stronger, which leads to an overall 20% improvement in the enclosure's strength-to-weight ratio."

The fourth change is more a matter of rear-panel cosmetics and user convenience than a performance-enhancing update. The older 1.2 has three pairs of binding posts. The new 2.2 has two pairs and is the only readily apparent visual difference between Sonja 1.2 and 2.2 (unless you look closely at the tweeter). The back of the Sonja 2.2 is cleaner looking because the two modules' binding posts are now in matching insets that meet each other at the modules' junctures.

Sonja 1 owners may upgrade their speakers (not including the cabinet update) to "Sonja 2 technology," as YG phrases it, for $9400 (2.1) $14,800 (2.2), and $16,800 (2.3) respectively. YG will also upgrade the cabinet, but it requires more modifications and an additional charge.

"Detail and ease" is a theme that a select group of excellent speakers, such as the Sonja, embody to a much greater extent than merely good speakers do.

Listening

In my review of the original 1.2, I wrote the following to frame my overall impression, "the Sonja 1.2 is simply stunning—dynamic range, frequency extension, tonal purity, transparency, soundstaging, and imaging... all stunning and sometimes goosebump-inducing and involuntary grin-forming as it calmly goes about its musical business. The Sonja 1.2 does not have an easily identifiable dominant sonic character such as 'liveliness' or 'silkiness,' nor does it have an apparent bottom-up or top-down tonal balance. Rather, the 1.2 seems to simply convey the content of the recordings it is tasked to play back—and the characteristics of the gear with which it is partnered, of course—without much apparent imposition of its own."

That summary still applies to the new 2.2 but is augmented by even greater resolution, ease, and general facility. The sonic sum of the Sonja 2 changes seem to amount to more than their updated constituent parts would initially indicate, al-

Specs & Pricing

Driver complement: One 1" YG BilletDome tweeter, two 6" YG BilletCore mid-woofers (main module), one 10.25" YG BilletCore woofer (bass module)
Frequency response: Usable output below 20Hz to above 40kHz
Sensitivity: 88dB/2.83V/1m anechoic
Impedance: 4 ohms nominal, 3 ohms minimum
Recommended amplifier power: Minimum, 60 high-current watts
Crossover points: 65Hz and 1.75kHz
Cabinet: Aircraft-grade milled aluminum
Dimensions: 13" x 51" x 25"
Weight: 271 lbs. each
Price: $76,800 per pair, available in black finish (silver by special request)

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Associated Equipment
Analog source: Basis Debut V turntable and Vector 4 tonearm, Benz-Micro LP-S MR cartridge
Digital sources: Ayre C-5xeMP universal disc player, Hegel Mohican CDP, HP Envy 15t running JRiver MC-20, Hegel HD30 DAC
Phonostage: Moon by Simaudio 610LP
Linestages: Ayre K-1xe, Hegel P30
Integrated amplifier: Hegel H360
Power amplifiers: Gamut M250i, Hegel H30
Speakers: Dynaudio Confidence C1 Signature, YG Acoustics Sonja 1.2
Cables: Shunyata ZiTron Anaconda signal cables, Nordost Heimdall 2 USB, AudioQuest Coffee USB and Hawk Eye SPDIF, Shunyata Anaconda SPDIF, Shunyata Sigma power cords
A/C power: Two 20-amp dedicated lines, Shunyata SR-Z1 receptacles, Shunyata Triton v3, and Typhon power conditioners
Room treatments: PrimeAcoustic Z-foam panels and DIY panels

though the new BilletDome tweeter certainly is an obvious technological advancement. The level of resolution of fine detail is improved. Initial transients and timbre are better fleshed out. Decays and spatial cues are clearer and easier to follow. Loud peaks are more explosive while also sounding more composed or "cleaner." In short, music simply sounds more present and impactful—as the recordings themselves allow. A real bonus with the new version's increase in fine resolution is that it is not accompanied by a tonal emphasis shift, which can make a speaker sound as if it is forcing details on the listener, a flaw too often associated with speakers with "high-resolution" ambitions. In fact, the Sonja 2.2's greatest strength, in my opinion, is its uncanny level of resolution and its lack of apparent artifice or strain. One can more easily relax and enjoy the music as it unfolds because there is so little hardness in the upper frequencies. "Detail and ease" seems to be a theme that a select group of excellent speakers embody to a much greater extent than merely good speakers do. Count the Sonja 2.2 among that select group.

The outer extent of the soundscape is also expanded, especially horizontally. This expansion is not overwhelmingly better than with the previous version, in which soundstaging was already a strong point, but it does impart an impression of greater openness. Recording and upstream system quality permitting, the stage extends well outside the cabinets in a room-boundary-defying display that helps mitigate the limitations of my smallish 12.5' x 17' room. Compared to most other speakers, the soundstage sounds as if the YGs were placed about two feet farther apart and in a slightly larger room than they actually are. Individual images within the larger soundscape are focused, not in an exaggerated, hyped-up way, but in a manner that simply makes subtle musical elements more discernible. On the Stravinsky *Song of the Nightingale* LP [Oue/Minnesota, RR], I could easily visualize the orchestral sections arrayed before me, and there was enough information to convincingly portray individual instruments within those sections. Overall soundstage depth and height were also strong points, as were individual image depth and image density. Perhaps the most salient soundstaging characteristic lay in the continuousness of its entire sound envelope such that the speakers are sometimes not discernible as the source of the sound. On some recordings, like the Classic Records LP reissue of the Prokofiev *Lieutenant Kije* [Reiner/CSO, RCA], it is as if the 2.2s just happen to occupy the same part of the room where the soundscape exists, so complete is the apparent detachment of the sound from the speakers.

Complex passages sound cogent and discernible. The timpani part in the RR *Nightingale* uses flams and short rolls in the opening section of the "Chinese March" movement as if to say, "brrrum...brrrum...brrrum" instead of "boom....boom...boom." Details like these emerge readily through the 2.2 but can become swallowed up in a less differentiated mass of sound through less revealing speakers. Subtle fingers-on-strings or singers' lip sounds in small, intimate music come through very clearly, thereby allowing a higher level of the human expressiveness in the music to be readily conveyed to the listener. Again, nothing sounds forced to achieve this lovely resolution. Music unfolds in a balanced way—tonally, dynamically, harmonically, and visually proportionally realistic within its overall soundscape.

Basically, the Sonja 2.2 carries through whatever the characteristics of the upstream system give it and does so with a kind of assuring competency. Of course, if you play a bad recording or a system mismatch exists upstream, the 2.2 will let you know. Neither of the two Sonja models I have lived with fall into the "twitchy

racehorse" category of speakers, requiring only a relatively narrow selection of partnering electronics and cabling to make them rewarding to listen to over the long haul. On the contrary, I find the 1.2 and now the 2.2 to be a great all-rounders with both tonal neutrality and affording flexibility in system-matching. The only caveat on this point is that—even though the crossover has been updated to accommodate less powerful amplifiers—I would still recommend using an amplifier with at least 100 watts (YG recommends at least 60), and I would still favor high-current solid-state amplifiers or higher-powered tube amps over other types.

As already mentioned, the new version has a bit more low-end weight. The characteristic YG bass speed and articulation are still there, but the low end is now just filled in a little better. Dynamic punch is also a touch better. Some of this dynamic precision may come from the easier load presented to the powering amplifier via the 2.2 crossover adjustment, but it may also stem from the new tweeter. It is simply able to handle the acceleration forces better. Even though much of our sense of dynamic force comes from power and speed in the bass region, the upper frequency range has to keep up and maintain its composure as well, or the whole illusion of a grand dynamic sweep won't be convincing. The Sonja 2.2 is just a little more exciting to listen to than the 1.2—not that the 1.2 was a slouch by any means. Rock and pop music both have a hair more drive, and orchestral crescendos have a bit more impact.

Like many sealed-cabinet (air suspension) designs, the Sonja 2.2's bass performance favors agility, tunefulness, and pitch-definition over raw bass power and the "room loading" quality more typically associated with ported (bass-reflex) designs. The 2.2's lower frequency extension is indeed very low—full-range for all intents and purposes in my setup—but it does not overtly "pressurize" the room with gut-moving bass like some similarly sized ported speakers do. Very low notes on electronica by artists like Björk and Aphex Twin are projected into the room with exhilarating impact, but they are not overblown or out of control. YG lists the frequency range as, "usable output extends from below 20Hz to above 40kHz." I presume this means the listed bass response takes into account how the speaker interacts with typical domestic room boundaries and may be more meaningful than traditional -/+3dB anechoic chamber specifications. All I can say here is that bass extension and power are excellent in my setup—as are bass tunefulness and articulation. I have also heard the older Sonja 1.2 in a few other rooms—usually larger than mine—and the bass performance never sounded deficient in those systems.

Just like the Sonja 1.2, the 2.2 does not have an obvious sonic personality. Some recordings sound a bit calmer and more "organized," less strained and jumbled, than they do through many other

Manufacturer Comments

YG Acoustics Sonja 2.2

As a hard-working audio manufacturer there is always the hope that the critic will look a bit deeper at the underlying realities and aims of a given design. All of these important verities were explored and uncovered by a great journalist—Kirk Midtskog. How do you follow up a great review of a predecessor? Exactly as Mr. Midtskog does.

As Kirk mentions, one of the most significant evolutions in the Sonja 2 series involves the addition of the trademarked BilletDome tweeter (introduced in the Sonja XV), which is clearly our most complex mechanical invention to date. Mention is also given to the fact that changes were made to the crossover—specifically to its low-frequency section, and the overriding reason for the improvements in bass that Kirk noted, are due to the proprietary ViseCoil bass inductors. These large, in-house CNC-wound inductors are made like no others. Encased in a vise-like milled structure they reduce loss by 24% and improve linearity by 60%. The result is far greater bass impact and control over the woofers, while permitting an easier job for most amplifiers.

Many thanks go out to the talented Kirk Midtskog and TAS.

Dick Diamond
Director of Sales & Marketing
YG Acoustics, LLC

Manger s1

All of us at Elite Audio Systems and Manger Audio appreciate Neil Gader's assessment of the Manger p1 loudspeaker. For 45 years, Manger Audio has dedicated its research, engineering, and craftsmanship to producing an accurate and natural-sounding product. The Sound Transducer, with its unique bending wave principle, is faster than any regular membrane-drive speakers, because it doesn't store any energy. The transducer produces a sound that can be enjoyed for hours with natural colors, inner details, and realistic speed of sound. It is also true that the Manger driver is better suited to pair with higher powered amplifiers for the best integration of drivers.

We appreciate Neil's recognition of Josef Manger's life's work. His daughter, Daniela, continues to refine and advance her father's work.

Michael Woods,
Elite Audio Systems, Inc.

I would like to thank Neil Gader for this wonderful review, and also to comment on some points. The Manger driver has an efficiency of 91dB; the s1 system has an efficiency of 89dB. In the time since we shipped the review samples, we have upgraded allour speakers,improving the timing and control of the woofer through better internal wiring and damping. We have also enhanced the performance with faster high-frequency capacitors. This upgrade is now standard in all speakers delivered since July 2017.

Daniela Manger

speakers. So, this clean and organized quality is about as close to a sonic personality as I can determine. Other than that, the sound I heard through the 2.2 seemed to be more determined by the upstream gear than by the speaker's own intrinsic sonic signature. The word calm might imply polite or even boring to some readers. The Sonja 2.2 is not at all sedate. On the contrary, the Sonja 2.2 allows music's innate artistic qualities to be expressed in large measure. Subtle, contemplative music like some of the Third Stream material on the ECM label sounds evocative and moving, not merely moody and slightly quirky. Hard-driving rock selections from bands such as Tool take on near-frightening acceleration through their sheer intensity. Classical music sounds rewarding in its timbral complexity and structural richness. The Sonja 2.2 does not favor—nor is it limited to—a particular kind or scale of music, at least not in the confines of my room and even in some larger ones. If you really like the big stuff, played on a grand scale, and you have the spacious room and the rest of the system to support it, you'll need a bigger speaker. (This is where the YG dealer will steer you towards the Sonja 2.3 or Sonja XV models.) For most listeners, though, I believe the 2.2 will be all that is needed. The technology YG likes to cite in its marketing material, like ToroAir (toroidal inductors), ForgeCore (driver motor system), and ViceCoil (vise-like housing for large inductors) draw attention to its differentiating engineering elements, but at the end of the day, the product needs to serve music reproduction, and, in my experience, the Sonja 2.2 does so admirably.

Considerations

The nearly 275-pound weight of each speaker may deter some music lovers. Unloading, assembling, and placing the Sonja 2.2 is definitely at least a two-person job. (Your dealer will arrange to send one or two people out to your site to install them.) While the 2.2 does not dominate a room like many large speakers do, it is still a medium/large, all-metal floorstander, so it may not please some folks' aesthetic sensibilities. As mentioned, the speaker favors high-current solid-state amplifiers or higher-powered tube amps over their lower-powered cousins. To really take advantage of the resolving and dynamic abilities of the Sonja 2.2, it helps to use the best partnering gear and cabling one can assemble, which also adds to the cost of ownership. Some audiophiles may prefer the bass quality of a similarly sized ported speaker. I find the 2.2's bass extension, impact, and definition to be flawless in my setup.

Conclusion

What I had said about the original Sonja 1.2 in my concluding remarks in Issue 256 also applies to the new 2.2: "The Sonja 1.2 is revealing without sounding exaggerated. It is dynamically alive without sounding forced. It is tonally neutral without sounding clinical." How can I top that sort of praise? I am now in the slightly awkward position of having to say, essentially, "Yes, what I said then, and now more...more detail, more dynamic ease, more expressiveness, more bass weight, more soundstage continuousness." The Sonja 2.2 is a speaker that serves the music, no matter what kind, with great facility and aplomb. And again, the new version gets my highest recommendation. **tas**