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MAGNUM OPUS

Wilson WAMM Master Chronosonic

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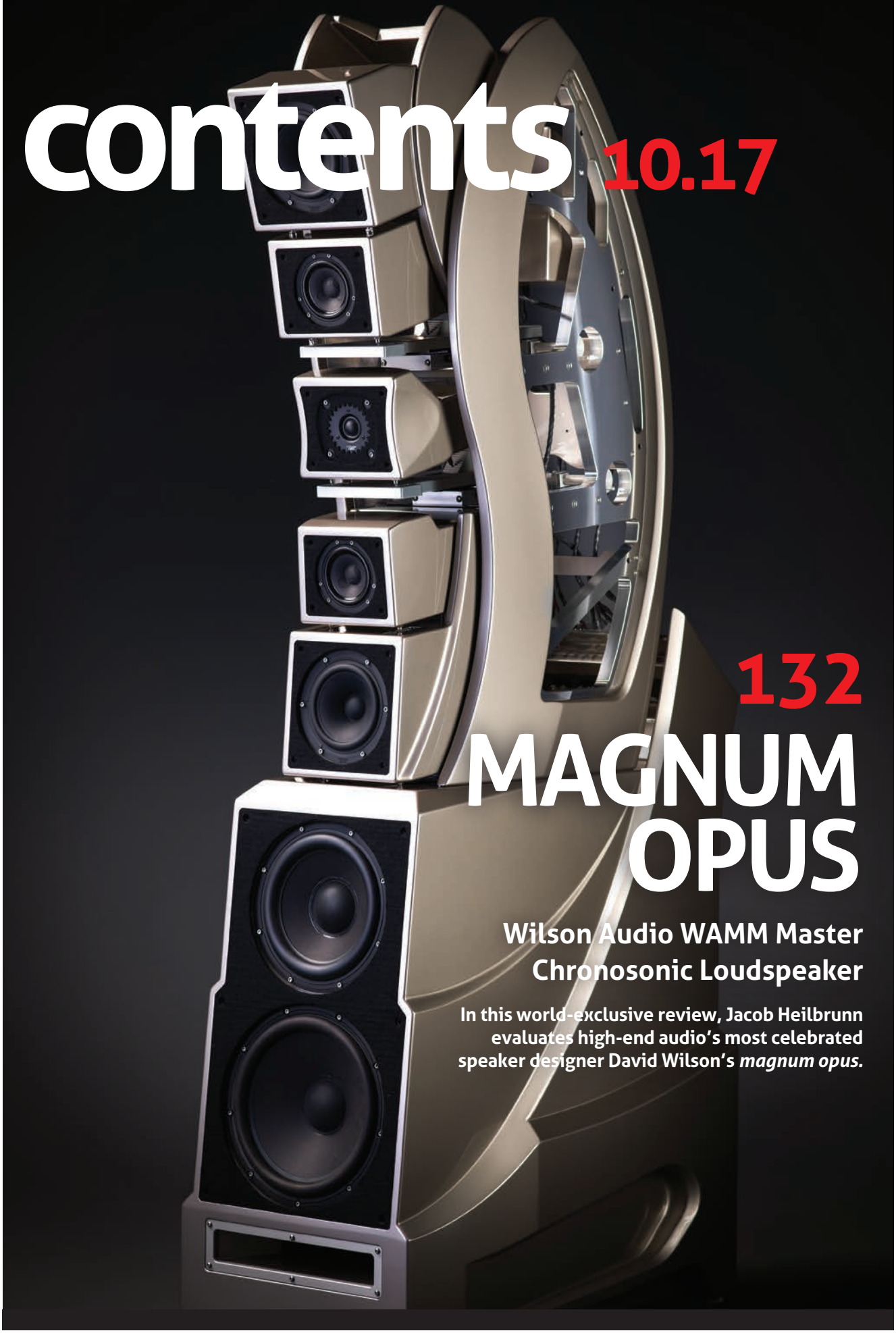

MAGNUM OPUS

Wilson Audio Modular Monitor (WAMM)
Master Chronosonic Loudspeaker and
WAMM Master Subsonic Subwoofers

by Jacob Heilbrunn

If, as a famous poet once said, in dreams begin responsibilities, then David Wilson's started at a tender age. It was 1959. On Christmas Eve, a gawky fifteen-year-old boy who lived in Sacramento, California, was fitfully trying to go to sleep at his home on Yellowstone Avenue, overly excited by the prospect of the family exchanging presents in the morning. Matters were not helped by the spectral sound of Christmas carolers singing outside. Where were they? He poked his head out the bedroom window. Eventually it dawned on the lad that just up the street Mr. Bob Wills had parked his imposing Klipschorn speaker on his front porch to entertain his neighbors. The verisimilitude was simply uncanny. He had never heard anything like it. The world was before him. And so the audiophile bug bit the young man hard. "I literally had dreams about this speaker," Wilson recalled decades later in the book *Sound Bites*.

As a youth, he became an avid buyer of vinyl, traipsing down to Mamie's Record Shop in Sacramento, where he would covet RCA Red Seal pressings as well as some Mercury and London pressings for their broad low-frequency curves. Wilson recalls that he would carefully scrutinize various LPs to assess the amount of vinyl cleavage they possessed before plunking down his hard-earned dollars. E. Power Biggs'—what a wonderful name for an organist!—*Festival of French Organ Music* was a favorite, one that he literally wore out.

During the 1960s Wilson kept experimenting with amplifiers and loudspeakers. An abortive attempt to build a Heathkit amplifier, in which excessive haste and enthusiasm resulted in acrid smoke filling the Wilson home after he threw the power switch, left him undaunted. Soon enough, David managed to impress his friends and even a young Sheryl Lee Jamison with his sonic El Dorado.

After marrying Sheryl Lee, he reckoned that a real job was a must. But even as he worked at a day job in the medical industry in the Bay Area, Wilson earned a name as a fine sound engineer and served as a reviewer for a magazine called *The Absolute Sound*. His survey of a variety of cartridges remains legendary today for its concise judgments: "The Shure V-15 failed its review." In 1984, in an essay for *Playboy*, he also blew the whistle on the compact disc: "Disciples of digital, seeking perfect sound, forever, have instead found imperfect sound for longer than even they are likely to want it." Today a number of Wilson's analog recordings are being re-released by Chad Kassem's Acoustic Sounds on premium vinyl, and they sound better than ever.

At the time, Wilson was never wholly satisfied with the loudspeakers he used to monitor his recordings. He wanted more. A speaker company, however small, was the only way to achieve it. The impulse to design loudspeakers actually predated by 14 years his quest to make the perfect recording for his record label Wilson Audiophile Definitive Recordings. Without understanding Wilson's perfectionist streak and innate fascination with the sound of live acoustic musical instruments, you simply cannot comprehend his desire to produce the ultimate loudspeaker.

In 1973, Jon Dahlquist released a loudspeaker called the DQ-10 which was the subject of a landmark TAS review by HP. Dave purchased a pair. The Dahlquist relied upon a staggered array of drivers to improve time alignment. For Wilson it was a revelation. Ten years earlier, Wilson had noticed that he could improve the sound of his home-made speakers by carefully positioning their upper-range baffles behind the plane of the woofer baffle. Thanks to Jon Dahlquist, Wilson realized the key was timing synchronicity. Until now it was as though he had been trapped in Plato's famous cave, staring at the shadows on the wall, confusing them for reality. Now he saw the light. Wilson wanted to build upon Dahlquist's pioneering effort by optimizing speakers so that individual drivers could be positioned both for different distances and ear heights.

The idea behind the original WAMM was to attempt to achieve the Holy Grail of perfect time synchronicity at the listening position.

The first loudspeaker produced by Wilson Audio Specialties in 1981 was, thus, the Wilson Audio Modular Monitor (WAMM), a $28,000 four-tower behemoth. It was first demo'd to the public at Garland Audio in northern California in November 1981. Two pair sold immediately. The idea behind the original WAMM was to attempt to achieve the Holy Grail of perfect time synchronicity at the listening position—a concept that has been at the heart of Wilson's efforts ever since—by adjusting individual modular drivers for distance and listening height. Wilson was awarded a patent for adjustable-propagation-delay loudspeaker arrays in 1984. The prowess of the original WAMM had serious audiophiles from around the globe flocking to the Wilson's living room to take it for a sonic test drive. One such visitor in 1984 was from the British publication *HiFi News*. Ken Kessler offered a vivid account of the Wilson household in Marin County: "The Wilsons are a gracious couple who seem far too normal to want to house a multi-array loudspeaker system straight

out of Flash Gordon in the middle of their living room. You go in expecting, say, a pair of small ARs, and you walk straight into these massive constructs wearing electrostatic panels, KEF mid/bass drivers, teensy Braun boxes, and—just a bit behind them—towers housing woofers the size of Pirelli P7s."

It was off to the races for Wilson Audio. The company began to grow, finally surpassing the capacity of its 3600-square-foot rented shop in Novato, California. In early 1990, Sheryl Lee, who is in many ways the driving force behind the success of Wilson Audio, flew out to Provo, Utah, and signed a contract for a substantial plot of land on its outskirts. Ever since, decade after decade, Wilson has produced loudspeakers that have made waves in the audio industry and that drew on the initial impulse behind the WAMM—from the X-1 Grand SLAMM to the XLF. Despite the numerous improvements that Wilson effected in its loudspeakers, a diehard contingent has always refused to budge from the original WAMM, which can still fetch a pretty penny on the Internet. A rumbling turned into a clamor over the years for a new WAMM, one that incorporated and built upon the various advances that had been made since the original was put out to pasture. What's more, Sheryl Lee also pushed for David to produce his *magnum opus*…and she is a "driving force" for good.

Today, it is back to the future for Wilson. Once more, the company's credo is big is beautiful. And once more, David and Sheryl Lee have a massive four-tower system in their living room in Provo, Utah, one that tips the scale at over three thousand pounds—the WAMM Master Chronosonic plus the WAMM Master Subsonic subwoofers. This six-way, nine-driver system, plus twin subwoofers with a total of six 12" drivers represents the culmination of Wilson's efforts to produce a loudspeaker that can reach for the sonic heavens, one that is as impressive visually as it is sonically. Wilson, who has handed the reins of his company over to his talented son Daryl, views the WAMM Master Chronosonic as his final statement on loudspeaker design, and the company plans to limit production to 70 pairs (plus one "designer proof"), making it a *rara avis*, indeed. There's also the formidable cost of entry: a 2017 introductory price of $685,000 per pair of WAMM Master Chronosonic (Master Subsonics are an additional $45,000 each). Given David Wilson's drive and intellectual curiosity, I suspect that he will continue to tinker with the WAMM Master Chronosonic in coming years since it forms a great platform. At a minimum, the advancements contained in the WAMM Master Chronosonic are certain to trickle down to the rest of the line; the well-received Alexx, which was designed by Daryl, already contains trace elements of the WAMM Master Chronosonic.

To construct the WAMM Master Chronosonic, Wilson went to Herculean lengths.

To construct the WAMM Master Chronosonic, Wilson goes to Herculean lengths. Its height and depth combine to make the XLF loudspeaker appear diminutive by comparison. In designing the WAMM Master Chronosonic, Wilson sought to increase the speed and slam of the loudspeaker by using smaller drivers—10.5" and 12"—in the bass cabinet. The cabinet itself is about a third deeper than the XLF's, allowing the speaker to go lower in the bass than its immediate predecessor. The tweeter is a new version of Wilson's silk-dome Convergent Synergy Mk5, which represents a considerable step forward in lucidity from the inverted titanium dome that Wilson once deployed. But the heart of the WAMM Master Chronosonic, as always, is the midrange. Here Wilson has once again broken new ground when contrasted with its previous efforts. The midrange uses two drivers, a 7" and a 4" for each of the bottom and top midrange arrays of the MTM configuration. Each driver is mounted in its own module, and they are adjustable relative to each other. Previously, Wilson ran its tweeters pretty hard, down into the 1.5kHz to 2kHz region. The additional upper-midrange driver on the WAMM Master Chronosonic means that the tweeter can be crossed over at a higher point (2.5kHz to 3.5kHz) and doesn't have to work as hard. The resultant reduction in diaphragm displacement indubitably has significant sonic benefits. There is nothing fancy or exotic about the composition of its paper-and-pulp diaphragm. But as always, the secret rests in the blend or, to put it plainly, the sonic result.

Wilson prides itself on its innovative approach to enclosure materials, disdaining an aluminum baffle and other metals in favor of its proprietary phenolic resins. The WAMM Master Chronosonic features what Wilson calls X-material,

S-material, and W-material. W is the newbie—it is said to have superb damping properties. It adds very thin layers of proprietary material to phenolic resin and is embedded in the sub-plate of the adjustment track-bed for the midrange and tweeter drivers. These sub-plates, which are difficult to manufacture, have immensely improved Wilson's ability to adjust the individual drivers' outputs—to within 5 microseconds at the listening position, as measured by Wilson. Need I add that the infrastructural gantry (but not the baffle) that helps to house the modules is made out of aerospace-grade aluminum with X-material damping covers?

Finally, Wilson has also greatly improved its subwoofers; like the main speaker, the new subs are taller and thinner. The aim is to produce a sub that can both go lower and match the speed of the mains.

If the fit and finish of the WAMM Master Chronosonic are much superior to any earlier Wilson product, it is also the case that the specs differ somewhat from the XLF and Alexandria X-1 and X-2. The WAMM is less sensitive, coming in at 90dB with a nominal impedance of 3 ohms that dips to 1.77 ohms at 310Hz. What that means, boys and girls, is that you need a stout amplifier. No SETs need apply here. Wilson recommends at least 100 watts, which really is the bare minimum.

How far can you take our obsession, equal parts wacky and noble, with recreating the sound of music?

After this lengthy exordium, you may well be wondering what does the darned thing sound like? Has Wilson simply created a monument to excess or does its fancy new loudspeaker deliver the goods? Is it really necessary to go to these lengths, or does it become a prolonged exercise in overkill? I admit that I asked some of these questions myself before receiving the loudspeaker and subwoofers. For several years, I had happily listened to the XLF, coupled to a pair of Hammer of Thor subwoofers. In the fall of 2016, TAS editor Robert Harley traveled to Provo separately to get a sneak peek, and listen to, the WAMM Master Chronosonic. I had already visited Wilson a few months earlier to listen to a single WAMM Master Chronosonic prototype. As always, Wilson does much of his critical listening to a new speaker in mono. What Robert and I heard was the stereo P2 prototype—the actual crossovers were not yet incorporated into the structure of the speaker itself. Nor was the WAMM Master Subsonic subwoofer ready. Wilson did his traditional demo of stationing the XLF next to the WAMM Master Chronosonic. I've never found this method wholly illuminating because I find it frustrating to zip back and forth between loudspeakers; nonetheless, the promise of the WAMM Master Chronosonic was abundantly clear.

Still, shortly before the WAMM Master Chronosonic was slated to arrive, I felt that I had made some real breakthroughs in achieving sterling sound with the XLFs, in part by deploying both new Ypsilon Hyperion and D'Agostino Momentum amplifiers. The question from chums was the standard one: How much better can it get?

It didn't take long to recognize that the answer is "a lot." Wilson's labors have paid off big time, in ways both large and small. The installation in my listening room doubled as a training session for David Wilson's associates. Usually David Wilson (currently 72 years old) does not personally install and calibrate the WAMM Master Chronosonic; that demanding job is entrusted to specially trained and experienced individuals who direct a team from the servicing dealer. When the speakers were first fired up in my room—with a crowd that included David Wilson and his colleagues Peter McGrath and Bill Peugh as well as Maier Shadi of the Audio Salon—the sheer scale that the WAMM produces was instantly apparent. (The number of people in attendance should also give you an inkling of what it takes to set the WAMM Master Chronosonic up properly. This is not the normal installation process and customers will not have to endure such an intensive training session while their WAMMs are being installed.) The soundstage is enormous, the bass crushingly powerful, instrumental separation phenomenal, and the tweeter pellucid. The addition of the WAMM Master Subsonic subwoofers greatly enhanced these attributes. In fact, I would say that it is imperative to add the subwoofers if room size permits; they add about one-third more to the musical presentation, both in subtle details, scale, and bass extension. No doubt the addition of the subs also adds complications; they require full sets of cables and amplifiers. To underestimate the contribution of the subs, though, would be a grave mistake.

The qualities I've adumbrated above are only a means to an end. The most

remarkable aspect of the WAMM Master Chronosonic isn't its dynamic heft. Rather, it is the graciousness, coherence, and sheer velvety richness of the sound. The WAMM Master Chronosonic, in my view, allows digital to reach its potential—remove the rebarbativeness that seems to mar many digital recordings and you are left with a supernaturally low noise floor and powerful dynamics. The WAMM never has less than an inviting quality, a sophisticated refinement that draws you into the music and will have you, at times, swaying physically to the beat. If the WAMM has an overriding quality, it is that it represents a unique marriage of music and art.

Over and over again, I have found myself enchanted by the subtleties that the WAMM Master Chronosonic reveals, whether it's in baroque chamber music or orchestral works. For me the question the WAMM poses and tries to answer is: How far can you take our obsession, equal parts wacky and noble, with recreating the sound of music? I freely confess that I've been fascinated with it for most of my life. Many of my earliest memories revolve around music since my mother plays piano and my father always had a stereo in the house. In third grade, I would rush home at lunch hour to eat a peanut butter sandwich and listen to a 10" Jelly Roll Morton record or Louis Armstrong blazing away with the Hot 5 or 7. Music was in the air in Pittsburgh. A mile or so away, when I would bicycle to the public library, there was a house on a corner blasting out the strains of King Oliver and his band almost every day.

Withal, one of my passions remains trumpet music since I studied the instrument at Oberlin College. In fact, the literature for trumpet is what initially drew me to classical music in general, not to mention playing in orchestras. My old teacher Byron Pearson once looked at me during a lesson, lowered his voice to *basso profundo* level, and said, "Can you resonate?" It was a good question. What he meant was, at bottom, are you producing a shallow sound or one that smacks notes in the middle to produce as many overtones as possible? If you listen to professional trumpeters, you will notice just how rich and warm and relaxed their tone is—the very opposite of a flashy screech.

It is thus a fascinating experience for me to listen to various trumpet virtuosos on the WAMM Master Chronosonic. The WAMM will let you hear just how and how fast a trumpeter is depressing the valves of his instrument. In a way, I suppose, I'm performing my own private audition. When I was in Berlin a few months ago, I picked up a CD of Ludwig Güttler, who first made his name in what was formerly East Germany playing both period and modern trumpets. Since I'm so attuned to the instrument and have memorized a number of trumpet works, it is simple for me to focus on the different interpretations and approaches to various pieces. More than other loudspeakers I have heard, the WAMM Master Chronosonic allows you to peer into the soundstage and hear the minutest details with utter clarity. In the third movement of the Hummel Trumpet Concerto, I could for the first time accurately hear how Güttler was spraying out the 16th notes; they were exploding precisely out of the bore of his E-flat trumpet. In addition, the superior ability of the WAMM to convey the intonation of different instruments meant that it was far easier to detect the timbral quality of the very trumpet that Güttler was playing.

The combination of transient fidelity, gobs of air in the soundstage, and overall timbral fidelity combined to transfix me.

On another album by Maurice André, probably the greatest trumpeter of them all, an Erato disc featuring Albinoni's Sonata in D, the separation of organ and trumpet dwarfed anything I previously experienced. It was simply awe-inspiring to hear the ease

with which André, who was playing a Selmer piccolo trumpet, navigated the most treacherous passages in the *tessitura*, even as the organ pellucidly accompanied him in the background. I played this album on the Air Force Zero turntable as well as on the Continuum Caliburn, and it sounded captivating on both. The placidity of the organ, the steadiness of the beat were noteworthy. Also quite moving was a well-recorded CD on Sony of the Hungarian trumpeter Gábor Boldoczki playing Giulio Caccini's *Ave Maria* in F minor.

Again and again, I'm struck in listening to the WAMM Master Chronosonic by the way it conveys the sheer professionalism of the players. It also brings the venue to you, allowing a greater appreciation of the artistry of some of the world's greatest performers.

Something similar occurred when I listened to András Schiff playing Beethoven's Sonata No. 31 and the *Diabelli* Variations on an ECM digital recording. As I tried to indicate before, it's not necessarily the biggest pieces that are the most impressive on the WAMM. You *expect* a speaker of this size and scale to produce the orchestral warhorses with grandeur. For my money, it is the gracious way it draws you into the filigreed detail that is the most outstanding feature of the WAMM Master Chronosonic. The delicate and refined way it conveyed the *pianissimo* sections of Schiff playing the second movement was where you really hear what separates the men from the boys. Schiff barely depresses the keys but you can hear these gossamer-like passages magically shimmering in the air. The ability to descry Schiff's touch and his interpretive approach was a sheer pleasure. The combination of transient fidelity, gobs of air in the soundstage, and overall timbral fidelity combined to transfix me. Another recording that prompted me to utter a "Whoa!" was Jonathan Biss' performance on JB recordings of the *Appassionata* Sonata. I heard Biss a couple years ago in Berlin, and he is a supremely thoughtful pianist. The WAMM Master Chronosonic captured all of it. The rolling thunder of the bass and the instantaneous stop and start of phrases offered further testimony to the prodigious reserve powers of the WAMM.

A principal reason why the WAMM Master Chronosonic is able to deliver such sterling performance is the sense that the drivers are never intruding upon one another. Our ears have to work subconsciously to compensate for the smearing of drivers that occurs with most loudspeakers. Here, Wilson, in my view, has leaped ahead. The heroic approach to realizing perfect time-alignment between drivers at the listening position really has a decisive effect in improving not just the illusion of black space in the performance but also in eliminating overhang. On the Austrian baritone Florian Boesch's Hyperion label recording of Schubert's song "Abschied," or "Farewell," I was riveted by the deceptive simplicity of the music. At various points the piano sounds single notes, which decay into the distance, then die off completely. It actually fools you into thinking the song is over before it begins after a few seconds of dead silence. It's really quite a startling effect, a tribute to the WAMM Master Chronosonic's ability to produce a linear midrange. You never have the sense that the midrange drivers are straining to reproduce a musical passage. Quite the contrary.

This transient accuracy was also apparent on a Philip Jones LP called *Baroque Brass*. When my friend Christian Caryl, an editor at the *Washington Post*, was here recently he sat bolt upright when the first trumpet note exploded out of the grooves on a sonata for two trumpets and three trombones by Daniel Speer. The reason he was unnerved was that the note sounded like it emanated three feet in

Specs & Pricing

WAMM Master Chronosonic
Type: Six-way, nine-driver dynamic loudspeaker
Driver complement: 12.5" and 10.5" woofers (one each), 7" lower midrange (x2), 4" upper midrange (x2), 1" main tweeter, 5" rear-firing midrange, 1" rear-firing tweeter
Woofer loading: Cross Load Firing Port (selectable front or rear porting)
Frequency response: 20Hz–33kHz, +/-2dB
Sensitivity: 90dB 1W/1m at 315Hz
Impedance: 3 ohms, 1.77 ohms minimum @ 310 Hz
Dimensions: 21" x 84" x 37"
Weight: 900 lbs. each
Price: $685,000/pr.

WAMM Master Subsonic Subwoofer
Type: Three-driver subwoofer
Driver complement: 3x 12"
Frequency response: 10Hz–300Hz
Sensitivity: 87dB 1W/1m @ 100Hz
Impedance: 4 ohms, 2 ohms min @ 5Hz
Dimensions: 18" x 65" x 27"
Weight: 612 lbs. each
Price: $45,000 each

WILSON AUDIO SPECIALTIES
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Provo, UT 84606
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Associated Equipment
Continuum Caliburn turntable with SAT and Cobra tonearms, Lyra Etna SL and Miyajima Zero mono cartridges; dCS Vivaldi CD/SACD playback system; Ypsilon PST-100 Mk. II (silver), D'Agostino Momentum, and Conrad-Johnson GAT 2 preamplifiers; Ypsilon Hyperion, D'Agostino Momentum, and Musical Fidelity M8-700 amplifiers; Ypsilon VPS 100 and D'Agostino Momentum phonostages; Wilson Audio Watch active crossover controllers; Transparent Audio Opus Series and Nordost Odin 2 cabling; Stillpoints Ultra 5 footers and Minus K isolation platforms

front of the loudspeaker and almost as though it had started even before the Lyra Etna SL was in the groove. He was similarly taken aback when we listened to the original Robert Ludwig mastering of the venerable album *Led Zeppelin II*—a wildly generous eleemosynary contribution from Bill Pascoe, a local record collector of rock music—what with the electric guitars zinging back and forth on cuts like "What Is and What Should Never Be."

Another plus of the WAMM Master Chronosonic's superb driver coherence is that supporting instruments are not merely wispy bit players but conveyed in all their glory. This makes it easier to decipher the ebb and flow of a concerto, the bowing accents and the harpsichord accompaniment on various concertos. On the aforementioned Led Zep album, for instance, some of the most dynamic passages could start to get somewhat congested on the XLF. Similarly, on a record that I picked up in high school, a compilation of Rolling Stones songs called *Through the Past, Darkly*, it was possible to hear much further into the hall than before. Instruments such as a zither that had once seemed evanescent came through with their full sonority. Ditto for The Beatles' *White Album* on cuts like "Rocky Raccoon" or "Why Don't We Do It In the Road." Even on recordings that aren't as dynamically challenging, the WAMM Master Chronosonic clarity in the midrange allows you to get a much better grasp of the lines of music being played by a chamber orchestra.

Another plus of the WAMM's superb coherence is that supporting instruments are not merely wispy bit players but conveyed in all their glory.

Still, I rather doubt that anyone who purchases the WAMM Master Chronosonic is going to sit around all day playing lute music or soprano and voice. On the big stuff, the kind of works TAS founder Harry Pearson delighted in, the WAMM Master Chronosonic truly delivered what can only be called spectacular sonic vistas. My chum and fellow TAS reviewer Neil Gader, who worked closely with HP for a number of years, recently visited and brought along some of the HP super discs that he picked up at his recommendation in the 1970s, when they first appeared. Both were on the EMI label and both feature André Previn conducting the London Symphony Orchestra. The first was Benjamin Britten's *Four Sea Interludes*. The waves, so to speak, of sound that washed over us amounted to a kind of total immersion experience. The range of the WAMM Master Chronosonic from *pianissimo* to thunderous *fortissimo* within a split-second was truly awe-inspiring. The second album was Holst's *The Planets*. Once more, the WAMM Master Chronosonic delivered thunderous orchestral climaxes crisply and cleanly. On the Continuum Caliburn, LPs deliver a finality to the sound through the WAMM Master Chronosonic that is not to be trifled with. Both of these EMI albums will be readily apparent to veteran TAS readers as classics of their genre, but what a treat to hear them in their full glory. And if you want to argue the merits of Zubin Mehta's Decca recording of the Los Angeles Philharmonic playing Holst versus Previn's, go right ahead. The WAMM Master Chronosonic, which reproduces the intentions of recording engineers better than any loudspeaker these tender ears have heard, will let you geek out to your heart's content, if that's your bag.

What about the bass performance on very dynamic recordings? One of the things that has occurred since the WAMM Master Chronosonic arrived is that high-end friends are dispatching LPs to me that they feel are good test records. Plus I reckon they want to see how the WAMM stacks up against their own system when visiting. Just today Donald Fagan's *Morph the Cat*, sent by my good friend Ali Saad, who owns Avantgarde Acoustic Trios plus the full complement of Avantgarde Basshorns, arrived from Los Angeles. A fine bass test. I plunked the album on the Continuum Caliburn, lowered the tonearm, and sat back with a Cheshire Cat smile. The bass reproduction was tight and full and, above all, warm and refulgent.

Next it was time for some Marvin Gaye. His album *Live at the London Palladium* has been one of my favorites ever since I heard it in Los Angeles at the home of Jon Platt. Platt is a big-time record producer who owns Wilson XLFs, and I was bowled over by the prodigious soundstage and deep bass he was able to reproduce on his home system. But with the WAMM Master Chronosonic the record goes to another level. On the song "Got to Give It Up," the whacks of cowbells and other ancillary instruments, the pounding whacks of the drums, come through with unprecedented weight and dispatch. But plop on side three of the double album and once again you're enchanted by the sumptuous feeling of ease that the WAMM Master Chronosonic always conveys. The crooning backing voices are seriously and sinuously soothing. Gaye's own lilting voice emerges with a softness and continuity that just sounded much more realistic—less electronic, you could even say—than previous renditions. Ah, baby, baby, to borrow from Gaye's words, it's a real treat to hear such a realistic version of this concert.

Ultimately, however, I can't help coming back to the experience of listening to German *lieder*—known in English as "art song"—that form the distilled essence of classical music. The WAMM Master Chronosonic excels, above all, at delivering the emotional intensity of a performance. In particular, the Dutch soprano Elly Ameling's performance of Schubert's "An Die Musik," or "To Music" left me agog. Here we arrive at the heights of musical expression:

"You, noble Art, in how many grey hours, when life's mad tumult wraps around me, have you kindled my heart to warm love, have you transported me into a better world, transported into a better world!"

To my mind, this is what David Wilson has accomplished with the WAMM Master Chronosonic.

Wilson Audio

David Wilson Talks with Robert Harley about the WAMM Master Chronosonic

How long had you been thinking about creating a modern incarnation of the WAMM— not actively designing it, but contemplating the idea of actually building it?

For decades I've been aware that waveform-onset synchronicity [*time alignment between the individual drivers—Ed.*] at the listener's ear is a critical, yet usually overlooked, element of accurate music reproduction. The very large and operationally complex original WAMM addressed the challenge of synchronicity well. Its performance reflected that. But it was large. The Grand SLAMM was created to provide a more compact architecture, which would provide a meaningful timing-profile correction without the need for test equipment or subwoofers. Later, the architecture and driver complement were refined, and the X-2 Alexandria Series was born. As the years went by, my questions expanded regarding the listener's sensitivity to varying amplitudes of waveform onset and their rates of change. By 2006–2008 I began to think occasionally about a much more refined and powerfully resolving instrument than what had heretofore been available—what turned into the WAMM Master Chronosonic.

What motivated you take that step from conceptualizing the speaker to developing and building it?

There were idealistic motivations and there was a pragmatic motivation. Idealistically, Wilson Audio had vastly more capability and resources than I had available back in 1980–1981, so I was free to think more expansively with a reasonable hope of executing a mechanically complex system with the highest level of quality. That was exciting! Pragmatically, following a number of management meetings in 2010, I was able to establish consensus throughout our group for the idea of something quite different, and substantially more ambitious, than anything we had done before. While modest pressure was being brought to bear on us to produce a more expensive speaker than the XLF (because some other companies were doing it), I was not willing to produce something along the lines of the original WAMM, but with "better materials and drivers." Something "not too complex." That was the idea set forth by some dealers! I realized that the opportunity was here to take advantage of not only a willingness within our team to support a more expensive product, but also a confidence within that group that, if I designed my dream speaker and it was built like a masterpiece, there would be many discerning music lovers who would desire to acquire it. Timing, in business strategy, as in music, is everything.

How long did the active development take once you had committed to designing it?

Active development was 2011 through 2017.

After a lifetime designing speakers, was there still much to discover as you developed the WAMM?

I believe that, of all the components in the music playback system, the loudspeaker is the least perfect. I also believe they have the toughest job to perform. Thus, there is always room for improvement.

Many of Wilson's upper-end speakers have been built on the concept of drivers in individual enclosures that can be aligned in time and rotated, but not to the degree of precision in the Master Chronosonic. How important is that last measure of exactitude?

That precision of adjustability is most important to me since I use the WAMM Master Chronosonics as test equipment as much as a source of listening pleasure. They allow me to investigate perception thresholds in very small increments, on the order of 2–5 microseconds. The insights thus gleaned will be incorporated across a significant range of our products.

How does the final production version compare to the idealized concept that you've held in your mind for so long?

I'm delighted to state unconditionally that my expectations have been surpassed. One reason is that our engineering and manufacturing teams truly have performed magnificently. I believe their work is extraordinary and unparalleled in our industry. Other expectations that have been surpassed are the ones that I was not aware of before, and were only discovered as part of some of the new findings revealed by the Master Chronosonic over the last five months.

The Master Chronosonic is your *magnum opus*, one that you've said is your last loudspeaker design. Is it really your final statement?

I will always be a part of Wilson Audio. Daryl and I will create together as long as I breathe. I have the deepest confidence that Daryl will take, and has been taking, my vision for Wilson Audio and will build it productively and creatively beyond my time on Earth.

Neil Gader Comments on the WAMM Master Chronosonic

When Jacob Heilbrunn told me he'd decided to replace his Wilson XLF/Thor's Hammer rig with the newly minted WAMM Master Chronosonic, I found this choice something of a head scratcher. Why, I thought? I'd listened to the XLFs in his superbly spacious dedicated listening room on various occasions, and it was easily one of the very rare "state of the art" experiences I've had in this hobby. Plus, Jacob's room seemed to fit the Wilson towers like James Bond fits an Aston Martin or a Saville Row suit.

Of course, after hearing the WAMM in Jacob's home, I realized I was wrong. Very wrong. It's a more purely musical speaker than the XLF in every respect. Since this is just a comment, however, I'll cut to the chase and concentrate on a couple of areas where the Master Chronosonic simply blew me away. (Note: I did my listening prior to the installation of the WAMM Master Subsonic Subwoofers. Sadly, I missed their appearance by a week.)

Of its many mind-bending qualities, the most significant was the system's soundstage and dimensionality. Whether we were listening to jazz classics, full-blown symphonic fireworks from Holst and Britten, Bach chamber works, Leonard Cohen, or assorted pop/rock, the WAMM system reproduced hall dimensions with a facility that was so uncanny it bordered on the supernatural. String-section layering and individual players within sections could be localized with a precision akin to a GPS. Musicians were more palpably present. It was an experience so unique, even creepy, in its authenticity that the hairs on the back of my neck still stand up when I recollect it.

The other area that is shared with the XLF but more fully realized by the WAMM is its remarkable low-level resolution and micro-dynamics. I'm referring to "back of the hall" percussion cues: a tambourine rattle, a brushed snare, the pluck of a concert harp. This was the WAMM's gentle side—a quality that can only be fully exploited in a listening space that has a very low noise floor, such as Jacob's room. Further, the WAMM was more coherent and integrated top-to-bottom than the XLF, which, to my ear, often created exaggerated height cues, leading me to lift my chin to "see" the image more clearly.

Having previously heard the XLF augmented by the Hammer subs in Jacob's room, I felt that the WAMMs alone were not quite as fully realized as they might be. This system's pure-nitro output and effortless dynamics softened ever so slightly as it approached the bottom octave. The sense of weight and richness and resonance lightened, and the lower frequencies became just a little polite—a surprise considering the unlimited nature of the WAMM throughout the rest of the spectrum. Certainly at these levels buyers are not even going to blink at the added cost of the subs. But I imagine Wilson wanted to give prospective owners an opportunity to decide for themselves whether their tastes and room would demand the full Four Tower Monty.

I know what I'd decide.

The WAMM Master Chronosonic loudspeakers and Master Subsonic Subwoofers in Jacob's listening room.

Robert Harley Comments on the WAMM Master Chronosonic

I visited Utah late last year to hear the prototype WAMM at David Wilson's home and to see the first production parts for the WAMM being built.

I listened to some tracks David Wilson had selected along with familiar LPs, CDs, and SACDs I had brought with me. I was familiar with the analog and digital front ends: a dCS Vivaldi 2.0 for disc playback and a Basis Inspiration turntable with a Lyra Etna SL cartridge for LPs. We also listened to the original analog mastertape of David Abel and Julie Steinberg, played back on the same John-Curl-modified tape machine used to make the recording. This piano and violin duet, recorded by David Wilson and released originally on LP and more recently on hi-res download, is famous as one of the best (perhaps *the* best) recording of these two instruments.

Starting with the Abel/Steinberg, I have to say that this was the most realistic reproduction of music I've heard in my life. It had the advantage of being sourced from the original mastertape, but that fact alone didn't fully account for what I heard. The violin was reproduced with tonal richness and detail, spatial precision, and above all, startling presence. The piano's transient attacks were vividly alive, just as you hear from the instrument in life. The clarity was striking. Significantly, the massive WAMM got the physical scale perfectly correct; many mega-speakers sound overblown and artificial with smaller-scale music. In short, the WAMM reproduced these two instruments with an "in the room" realism that I haven't experienced before from reproduced music.

Turning to my own LPs and SACDs, the WAMM presented music with a seamless coherence that belied the large number of drivers spread out over the system's 7' height. In many ways the WAMM had the coherence of a single-driver speaker, but without the limitations of a single-driver speaker (extension at the frequency extremes and the ability to play loudly). In addition to this top-to-bottom tonal continuousness, the WAMM had a startling transient fidelity across the entire spectrum that was manifested as a sense of immediacy and realism. I've never heard drums reproduced with this speed, impact, and transient precision.

I had an unusual experience that highlights the WAMM's almost spooky sense of lifelike realism. About a minute into a track of an *a cappella* group singing in unison, one of the vocalists came in with a solo part in the center of the soundstage. So lifelike was her voice that I had an autonomic physical reaction—startled by the sudden and unexpected apparent manifestation of another human being in front of me.

My brief listen to the WAMM is one that will remain for me a landmark in my life of listening to and evaluating music-reproduction systems.

The WAMM's bass extension, power, and transient fidelity were astonishing. The speaker has the same output level at 23Hz that it has at 1kHz. It's not rolled-off by 3dB at 23Hz, but absolutely flat to 23Hz. Wilson demonstrated the bass extension with a thunderous E. Power Biggs organ recording.

The WAMM's spatial presentation was stunning. The large enclosures simply disappeared, replaced by a deep, richly layered, and intricately detailed representation of the instruments within a studio or concert hall. The way that instruments and voices hung in three-dimensional space, separate from one another yet part of the coherent whole, was breathtaking.

As well-rounded and complete a loudspeaker as the WAMM is, I'm reluctant to single out any one aspect of its performance. But there was one area in which the WAMM far exceeded any other loudspeaker I've heard—the clarity of individual instrumental lines. The WAMM "dehomogenized" the music and presented each instrument with startling lucidity. For example, on the Sheffield direct-to-disc *The King James Version*, I had never heard the individual timbres of each instrument in the brass and woodwind section with such crystalline clarity. Whenever I've played this record on other speakers, the baritone sax blended in with the other instruments, adding a tonal warmth to the brass and woodwind section by virtue of its richness in lower-order harmonics. But through the WAMM, the baritone sax was a fully independent entity—not just another sound within a continuous fabric. The precision with which the WAMM reproduces music was apparent on every piece I heard. Yet despite this massive resolving power, the sound was anything but analytical or clinical. Overall, my brief listen to the WAMM is one that will remain for me a landmark in my life of listening to and evaluating music-reproduction systems.

Wilson Audio

Robert Harley Tours the Wilson Audio Factory

Located in Provo, Utah, the Wilson Audio factory has expanded several times over the years to its current size of 40,000 square feet. The factory reflects an interesting dichotomy of modern manufacturing technology coupled with old-school hands-on craftsmanship.

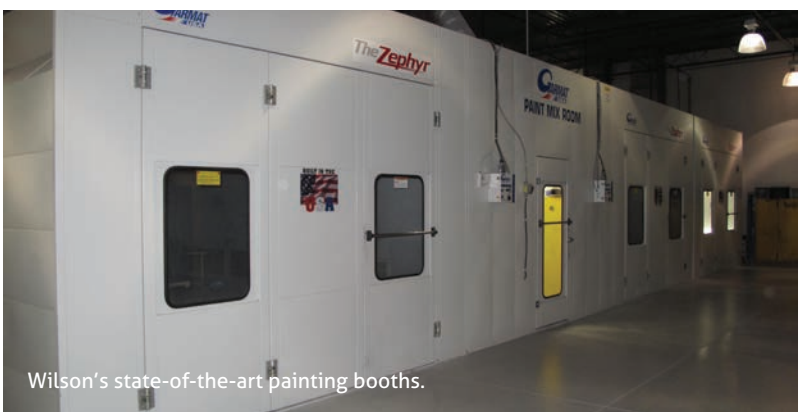
Every Wilson loudspeaker begins as one of four types of raw sheets of enclosure stock, all of it proprietary to Wilson. The company's X-material is an extremely dense composite of mineral, polymers, carbon, and cellulose bonded under high pressure. Its resonant characteristics are ideal for woofer enclosures. M-material (now in its fifth generation) was developed specifically for midrange enclosures. M-material has a lower resonant frequency than X-Material and is better damped. Wilson's S-material features another slightly different mix that it optimized for specific applications. The latest proprietary enclosure material to join the Wilson lineup is W-material, developed specifically for the WAMM. As with the other enclosure stock, W-material is made from phenolic resin, but features thin sheets of a proprietary metal alloy spaced an eighth of an inch apart within the resin to stiffen it. W-material is deployed at critical junctions within the upper gantry to dissipate vibration. Some loudspeakers in the Wilson line are built with a mix of three materials, with the WAMM built from all four.

As I toured the factory and saw the first WAMM parts being created, it struck me how different the circumstances are between the first-generation WAMM and this new model.

These materials are milled into cabinet panels on a massive CNC machine. Because these

Wilson's massive CNC machine cuts enclosure panels.


Inside the paint booth.



Wilson's state-of-the-art painting booths.


Painted surfaces are polished to a very high standard.

stocks are so hard, the cutting head must move very slowly and be replaced frequently. As you can imagine, this adds considerably to the cost of building the enclosure.

The machined panels and internal braces are assembled into an enclosure using proprietary glues and clamped into place for three days at high temperature. After this curing process the enclosure is sanded to an ultra-flat and smooth finish. Wilson is obsessive in its finish quality, sanding every plane to a tolerance of four one-thousands of an inch. Once the enclosure is perfectly smooth it is sprayed with gel-coat, a marine-grade vinyl polymer that encapsulates the entire box, ensuring that the enclosure itself won't be affected over the long term by humidity. The gel-coat also provides an ideal surface for the paint application. The gel-coat is again obsessively sanded to very tight tolerances.

The enclosure then moves to Wilson's state-of-the-art paint booth where seven coats of automotive paint and three clear-coats are applied. Wilson loudspeakers are available in a wide range of stock and custom automotive colors. The paint is cured for seven days. The paint is wet-sanded to a high luster. The standard of quality is beyond obsessive; I was shown an enclosure that was rejected for a "flaw" on the bottom panel that took me more than a minute of careful scrutiny to discover, despite it being pointed out to me. Wilson explained that perfection is just inherent in the company culture.

A nearby machine shop produces all the aluminum and stainless-steel components that go into every Wilson loudspeaker. These parts include port flanges, spikes, and the intricate hardware used to create the mechanism for articulating the midrange and tweeter modules on Wilson's upper-end models.

The crossovers are built in-house, with every one hand-tuned to match the reference crossover. Even the wire looms between the input terminals and the crossover, and from the crossover and the drivers, are built with a specified number of twists per foot.

Wilson Audio

The build-quality and fit 'n' finish are at the same level for every Wilson product. There's only one standard of quality for the entire line; the lower-priced models are simply scaled down in size and sophistication. The large shipping area accumulates finished loudspeakers during the week, which are then picked up by truck, bound eventually for proud and happy owners.

As I toured the factory and saw the first WAMM parts being created, it struck me how different the circumstances are between the first-generation WAMM and this new model. The first WAMM was built in a garage by one person—who held down a day job, no less. This time, David Wilson had at his disposal a team of engineers specializing in specific disciplines, craftspeople who could turn his concepts in physical prototypes, the benefit of modern materials technology, more than 30 years of loudspeaker design experience, advances in drivers and crossover components, and a factory capable of manufacturing such a complex loudspeaker—not to mention the luxury of the virtually unlimited development time made possible by the company's success. tas