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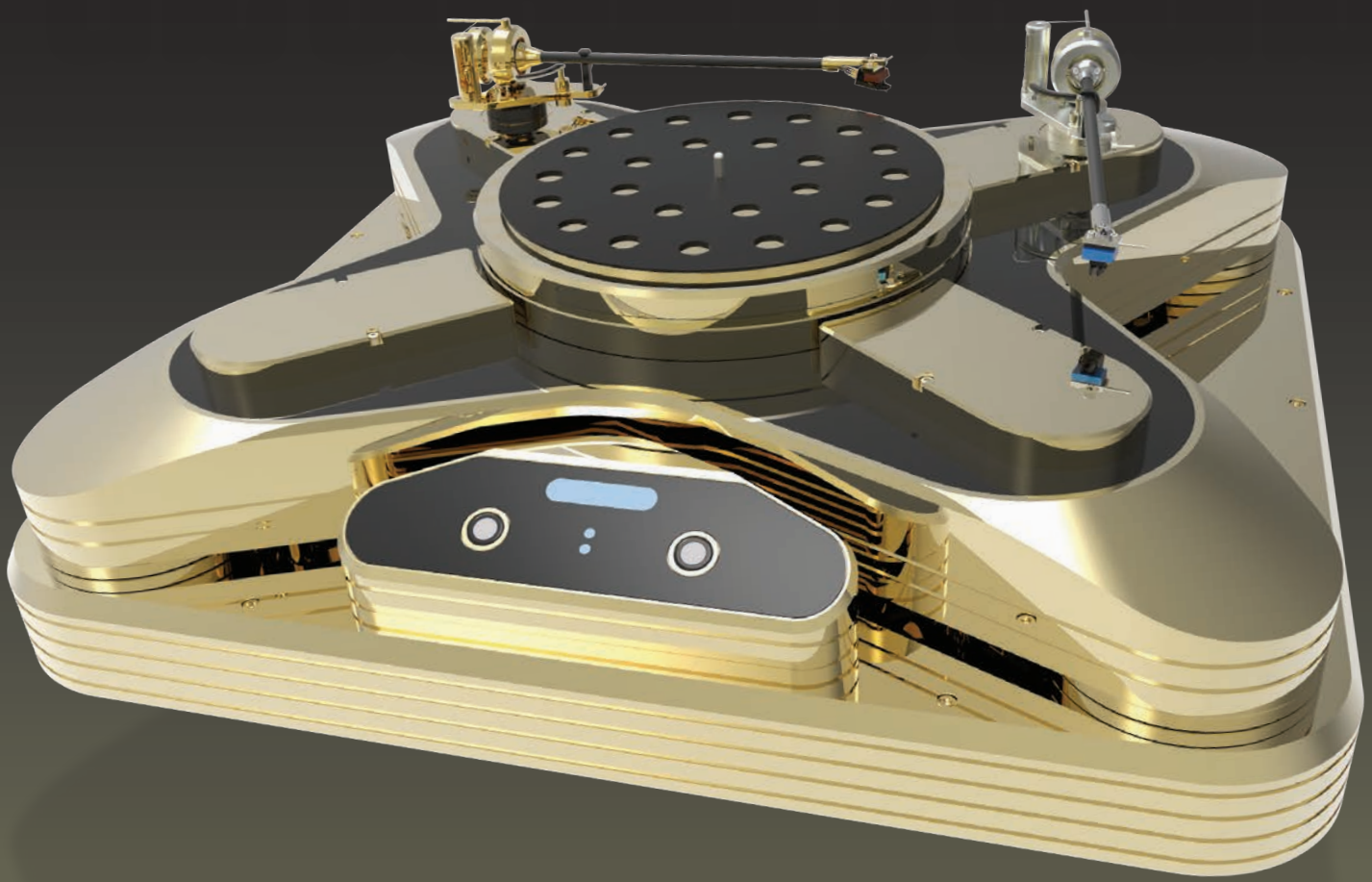
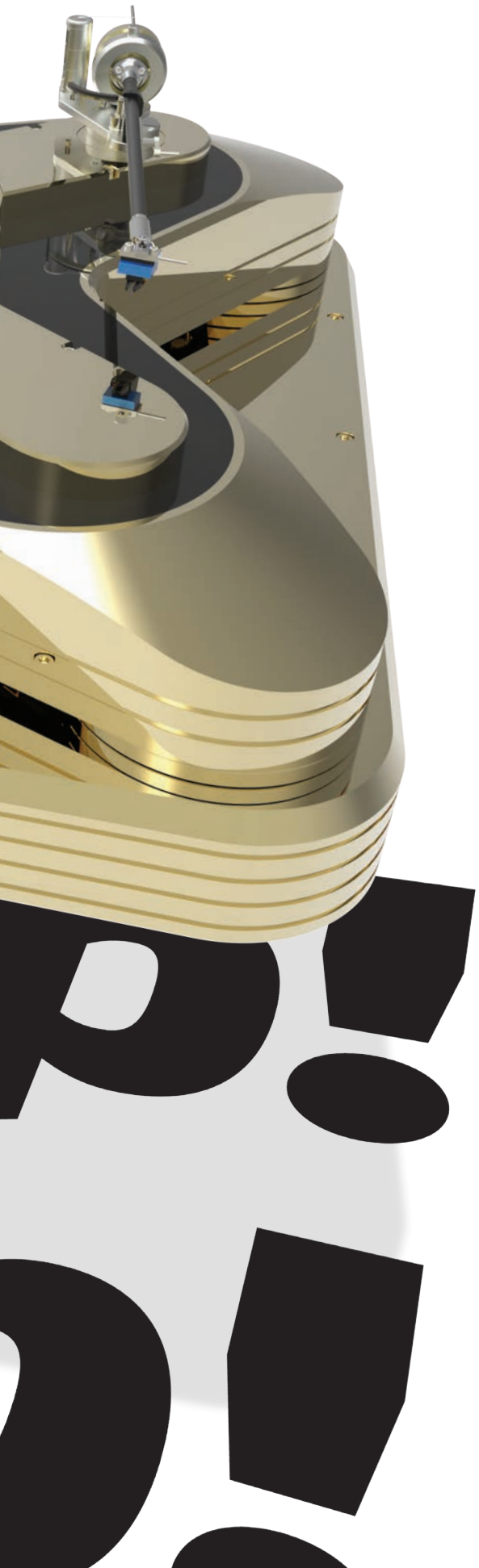
the absolute sound



Acoustic Signature's Incomparable Invictus

Beep
Beep



Acoustic Signature Invictus Turntable with TA-9000 Tonearm

Jonathan Valin

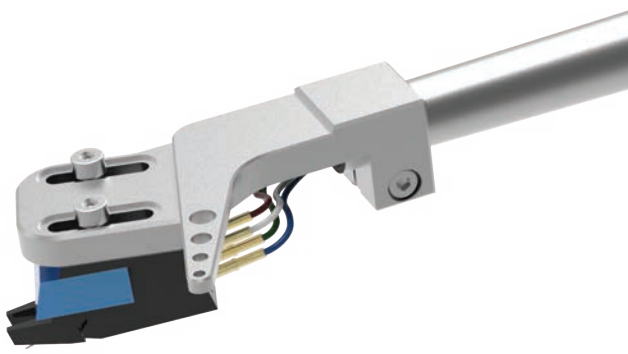
There has been a lot of talk in our magazine recently about things sounding alike. Aside from trivial differences in voicing or nuance it seems we are living in a world in which everything is sonically equal, and that, of course, means that paying a good deal more for something that sounds almost exactly like something else that costs a good deal less is a literal waste of money—or a flamboyant exercise in conspicuous consumption. One of our writers even went so far as to say that rather than buy a very expensive component—which he extolled—he would devote such money to charitable causes, as if people with the means to buy such things couldn't (and don't) do both.

Putting aside the fact that the entire purpose of *The Absolute Sound*, from Day One, has been to observe and comment on the differences in voicing and nuance among competing products—and that virtually throwing up one's hands in the face of such differences, large and small, is tantamount to abandoning critical thought—I'm not one who thinks that all contemporary hi-fi products sound alike or that the differences among them are trivial or that spending a lot (assuming you have a lot to spend) on something superior is a species of immorality.

What I do agree with—in so far as this fact plays a role in the everything-sounds-alike school of thinking—is that things have gotten better in hi-fi, and that they've gotten better across the board, regardless of price point. What has changed in my view—and it has changed in every type of component from front end to back—is the audibility of distortions. Simply put, noises of all sorts (be they electrical or mechanical) have been reduced, and as a direct result resolution of all sorts and transparency to sources have been increased.

Nowhere is this lowering of noise and increase in resolution more apparent than in front-end components, particularly analog front-end components. People sometimes wonder why, outside of old age and a perverse streak of Luddism, guys like me are still wedded to LPs—or why LPs are currently selling at a faster clip than they were in their heyday. For music lovers, it's not because LPs have better liner notes or cooler cover art or hipper appeal. It's because they sound better—which is to say, more beautiful, more exciting, more like the real thing. This was true at the dawn of the Digital Era, and in spite of the many advances that digital sources have made (and they have) it is even truer today.

Acoustic Signature Invictus Turntable with TA-9000 Tonearm



Perhaps you'd have to be a geezer (like someone I know) to fully appreciate how much more of everything (color, dynamics, detail, dimensionality, presence, sheer musical life) current LP-playback gear is able to retrieve from those fifty-or-sixty-year-old grooves—and consequently how much closer analog playback now comes to the sound absolute—than the very best of yesteryear or, in some cases, yesterday. The lowering of noise (particularly the susceptibility to resonance and vibration) in 'tables and 'arms and the consequent better tracing and tracking of contemporary cartridges, which have themselves greatly improved, have revolutionized (and I don't think that's too strong a word) LP playback. It is mind-boggling to discover how much you were previously missing on records you thought you knew by heart—on records you've been playing for virtually an entire lifetime—and how far hearing more of what you haven't heard goes toward creating a more credible illusion of the real thing. It kind of makes you wonder where it's all going to end—how much more music and performance is still hidden in those little canyons of vinyl.

All this brings me to the subject at hand, the Acoustic Signature Invictus turntable and TA-9000 tonearm. Simply put, this ultra-expensive bit of Teutonic engineering is the most neutral and natural sounding record player that I have heard in my home. And the differences between it and other rivals aren't trivial or matters of nuance, though whether or not you prefer what the Invictus has to offer is likely to be a matter of taste and bank account balances.

Not too long ago TAS' Paul Seydor reported that the TechDAS Air Force One turntable with Graham Phantom Elite tonearm produced a sound from LPs that was "not likely to be surpassed in our lifetime." Well…beep, beep! Here comes a potential surpasser—and, checking my pulse, I think it's still my lifetime. This incredibly massive (315 pounds of FEA-engineered, CNC-milled aluminum and brass, not including its optional 370-pound stand), six-motor, dual-belt-driven, almost Mayan-looking *objet du son* from Gunther Frohnhoefer of Germany is not only the biggest, heaviest, and most imperturbable record player I have ever come across—you simply cannot make it feed back vibration, even by pounding on it with both hands or stomping on the floor in front of it while it is playing—it is also the most versatile (it accepts four tonearms) and the simplest to use (at least, once you and an army of your friends have hoisted it onto a suitable support stand). Unbelievably quiet in playback, in combination with the TA-9000 tonearm it tracks with the precision of a Westrex cutterhead, reproducing instruments and vocals with unparalleled three-dimensionality, solidity, color, detail, power, pace—all those good things—and turning the soundstage into a veritable diorama of a symphony orchestra, a string quartet, a jazz quintet, or a rock trio.

You won't have to take a long look at the Invictus to figure out one reason why it is so imperturbable: The thing is gigantic.

You won't have to take a long look at the Invictus to figure out one reason why it is so imperturbable: The thing is gigantic—2.62 feet wide and 2.4 feet deep. I have never before used a turntable with a plinth and chassis this large—or this hefty.

As is the case with loudspeaker enclosures, there are some folks out there who will argue that all that mass is overkill. I'm tempted to say: "Don't believe them." But the truth is that I've heard lighter-weight 'tables, suspended and unsuspended, that have sounded excellent, and I've heard giant ones that have not. My point isn't to extol heavier record players and denigrate springier ones; it is much simpler and more specific than that. To wit, the theoretical advantages or disadvantages of mass-loading notwithstanding, the Invictus is audibly and demonstrably in a class of its own when it comes to resisting external vibration.

It may also be in a class of its own when it comes to freedom from what Robert calls "self-noise"—the resonances of its own constituent parts, both individually and as a system. That's because, in spite of its size, the Invictus isn't merely damped by its own considerable weight. Its platter, for instance, is a three-tiered, constrained-layer aluminum/brass sandwich meticulously joined together by a multitude of brass screws, with an additional 54 cylinders of brass (what Acoustic Signature calls "silencers") embedded in its precision-machined top plate to further damp external and internal vibration. Its optional (but most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highly recommended) 12-inch TA-9000 aluminum tonearm is built up millimeter by millimeter via a selective-laser-melting procedure (each 'arm takes 23 hours of processing on a €12 million SLM machine) to produce a stiff low-resonance structure impossible to fabricate by any other means. Internally, the 'arm has hundreds of tiny tree-branch-like "limbs" that connect its inner tube to its outer tube, channeling vibration like a grounding wire channels RF. With highest-tolerance ceramic bearings, made by the U.S. firm Timken (which supplies ultra-precise bearings for astronautics) it is as sonically invisible (and utterly imperturbable) as the Invictus itself, coming as close to the chatter-free ideal of zero-clearance/zero-friction operation as Gunther's engineering can manage. When you add to this, a conical CNC-milled aluminum subplatter powered by a six-motor, twin-belt drive system—in which each motor in a set of three is offset by 120 degrees to evenly distribute torque—a digital motor controller that constantly monitors the motors to keep them working with minimal vibration (Acoustic Signature claims that its motors run so smoothly you cannot tell by touch whether they are "on" or "off")—and AS' patented, self-lubricating, hand-tuned, low-friction Tidorfolon bearing, you can see how the entire structure of the Invictus not only works to keep the vibrations of your speakers and your room out of the equation, but also to keep whatever noise the 'table and 'arm produce, and whatever noise the LP itself generates as the stylus wiggles back and forth and up and down within its grooves, from being reflected back to the cartridge through the plinth, chassis, tonearm, and platter.

So what does this unparalleled (in my experience) immunity to vibration, external and internal, buy you sonically? In a word, clarity. In two words, clarity and ease.

Imagine trying to read a line of newsprint while someone is constantly jiggling your reading glasses. That's, more or less, the situation facing an analog front end. The vibrations fed back from speakers, room, and record player find their way into the stylus, where they are converted into electrical signals alongside the music. The result is something like the audible equivalent of blurred vision. In musical terms, tempo goes awry, as if the music is being played too slow or too fast; certain pitches or frequency bands get exaggerated, unnaturally brightening up the sound or, contrarily, darkening, thickening, and ballooning it; attacks either acquire a razor edge or a dull one, while transient details are exaggerated at the cost of tone color or simply blotted out as in a fog.

The Invictus suffers from none of these shortcomings. The result is a smoothness, power, and solidity that I simply haven't experienced, to this extent, from any other record player. The Invictus is detailed yet not aggressively so; it is lightning quick on transients but never spitty or analytical; it is smooth, yes, but at no loss in pace or dynamic excitement; it is dense in timbre but not dark or oversaturated; it is neutral without being sterile, and transparent to sources without being colorless; it has three-dimensional bloom and body without any loss in immediacy or liveliness. In short, it sounds very much like a mastertape.

After months and months of listening I could cite example after example of the way the Invictus performs, compiling the usual checklist of how it fares when it comes to bass, midrange, treble, dynamics, soundstaging, imaging, etc.

Acoustic Signature Invictus Turntable with TA-9000 Tonearm

Instead, I'm gonna settle on one LP, and one cut from that LP, to stand in for all.

The LP is *Dream with Dean*, a Reprise recording that has been re-issued in a two-LP 45rpm set by Chad Kassem's Analogue Productions. This is, by consensus, a phenomenal reissue of a superb disc that has undeniable nostalgic appeal for those of us who grew up in the 60s, when kids like me had one foot (well, a foot and a half) in rock 'n' roll (instead of in the grave, as is currently the case), but still nursed a sneaking fondness for the music and the performers our parents loved—the music we'd grown up with before Elvis, Sam, Bob, The Beatles, and The Stones turned that power hose on and washed everything else downstream.

Recorded in 1964, *Dream with Dean*, as those of you who own it already know, is an intimate set with Ken Lane (Dean's longtime accompanist) on piano, the great Barney Kessel on guitar, the much recorded Red Mitchell on bass, and "The Wrecking Crew's" Irv Cottler (Sinatra's personal drummer) on skins. While each member of this small group of expert musicians has his moments (Kessel in particular), the star is Deano, who, in the apt words of Joe Viglione, performs as if "he were a lounge singer at 1:15 a.m. as the Saturday night crowd is dwindling." (I've read where the studio in which *Dream with Dean* was recorded was deliberately decked out like a Vegas lounge, with low lights and appropriate furnishings—to set the mood.)

To keep the focus on Dean, he is very closely miked with what sounds to me like a Neumann U-47. Now, the U-47 was perhaps the most celebrated condenser mike of the early stereo period (the late George Martin used U-47s for all his Beatles recordings), but as a vocal microphone it had its peculiarities. Because of its squared-off housing (modified in the sloping chassis of the M-49), it had a bit of an upper midrange peak, giving it a slight nasality when used close in. With a deep baritone voice like Dean's this wasn't as big a deal as it might have been with a tenor or soprano, but even here you get a bit of added emphasis on fricatives, sibilants, and stops. Thus, every breath that Dean sucks in through nose and mouth, every smack of his lips is audible on the recording. And because Dean tended to take deep breaths in advance of extended phrases, there is plenty of his vocal technique (or lack thereof) to hear.

(Our publisher, Jim Hannon, told me an amusing story about Dean Martin, gleaned from *Memories Are Made Of This*, the book his daughter Deana wrote about her father. As a girl she once asked Frank Sinatra about the art of singing ballads while her dad was performing on stage. Apparently, Sinatra took the question seriously and went into a lengthy explanation of how he practiced breath control, articulation, landing on the right pitch. When Deana asked Frank if that's what her father was doing, he replied:

"Naw, he doesn't do any of that. He's just a natural.")

With a turntable prone to vibration, Dean's breath control (or lack of it) and the U-47s peakiness on sibilants and stops can be so audible they become distracting, especially on a number with little-to-no reverb like "If You Were The Only Girl." (I heard this cut played back on a large number of analog front ends at CES this year, and you would be surprised at how many made Dean's "s's" hiss like lawn sprinklers and "t's" clatter like dice in a Yahtzee cup.)

My point is this: While there is no question that this slight emphasis on upper-midrange transient detail is on the record, there is also no question in my mind that it can be (and is) exaggerated by record players that don't have the imperturbability of an Invictus (or of a TW Acustic Black Night or a Walker Proscenium Black Diamond V, for that matter—albeit to lesser extents). You hear Dean taking breaths, of course; you hear the minute fluctuations of his wide, slow vibrato. But he doesn't sound like a vacuum cleaner every time he breathes in and you don't get those hissing "s's" and clattering "t's." As a result you don't get distracted—by resonances added by the source component—from the entire reason why you're listening to the record in the first place: the warm, luscious timbre of Dean Martin's voice and the carefree languor of his delivery. This tape-like combination of ease, resolution, and naturalness is what the Invictus delivers like no other record player I've heard.

Oh, of course, the Invictus has outstanding power in the bass, tremendous speed and snap on transients, wide deep soundstaging, lifelike three-dimensional imaging, superb resolution. But so do other great 'tables. What they don't have—at least to the same degree—is the ability to preserve these things without adding resonant colorations and emphases of their own that the Invictus doesn't add.

At the moment I have four superior turntables in my home—the AMG Viella 12 (which is, IMO, *the* best buy in an ultra-high-end record player), the TW Acustic Black Night (which, though darker in tonal balance, comes closest to the smooth, full, imperturbable, tape-like sound of the Invictus at considerably less than half its price), the latest version of the Walker Proscenium Black Diamond V (the most purely beautiful and explosively exciting and best-soundstaging record player I know of—and my long-time reference), and the Invictus. Despite family resemblances in ergonomic strengths and sonic qualities, none of this quartet of 'tables sounds exactly (or close to exactly) like its competitors, with the same speakers, the same electronics, and the same cartridge in their 'arms. And yet all of them sound enough like the real thing to earn my highest recommendations. At the moment, however, the Invictus with its TA-9000 tonearm stands at the top. If you have the dough, the room, the record collection, the desire, and, most importantly, the permission, you're gonna be hard put to find better than this.

SPECS & PRICING

Acoustic Signature Invictus Turntable
Type: Aluminum/brass-sandwich, belt-driven turntable
Speed: 33 and 45rpm, 78 as option
Motor drive: Six-motor drive with DSP controller
Bearing: Tidorfolon
Platter: 345mm sandwich/silencer
Weight: 143 kg (315 lbs.)
Dimensions: 800 x 350 x 730mm
Price: $104,995 (stand is $17,498)

Acoustic Signature TA-9000 Tonearm
Armtube: SLM aluminum
Bearings: Timken ball bearings
Adjustable cartridge range: 9-inch, 4g–16.0g; 12-inch, 4g–22.0g
Mount: SME style
Signal cable: 1.50m 4n silver
Weight: 9-inch, 890g; 12-inch, 925g
Total length: 9 inches (252mm) or 12 inches (330.66mm)
Price: $18,999 (9"), $19,999 (12")

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JV'S REFERENCE SYSTEM
Loudspeakers: Magico M Project, Raidho D-5.1, Raidho D-1, Avantgarde Zero 1, MartinLogan CLX, Magnepan .7, Magnepan 1.7, Magnepan 3.7, Magnepan 20.7
Subwoofers: JL Audio Gothams
Linestage preamps: Soulution 725, CH Precision L1, Audio Research Reference 10, Siltech SAGA System C1, VAC Signature
Phonostage preamps: Audio Consulting Silver Rock Toroidal, Soulution 755, VAC Signature Phono, Constellation Perseus, Innovative Cohesion Engineering Raptor
Power amplifiers: Soulution 711, CH Precision M1, VAC 450iQ, Siltech SAGA System V1/P1, Odyssey Audio Stratos
Analog sources: Walker Audio Proscenium Black Diamond Mk V, TW Acustic Black Night, AMG Viella 12
Tape deck: United Home Audio UHA-Q Phase 12 OPS
Phono cartridges: Clearaudio Goldfinger Statement, Air Tight Opus-1 Ermitage, Ortofon MC Anna, Ortofon MC A90
Digital source: Berkeley Alpha DAC 2
Cables and interconnects: Crystal Cable Absolute Dream, Synergistic Research Galileo LE, Ansuz Acoustics Diamond
Power Cords: Crystal Cable Absolute Dream, Synergistic Research Galileo LE, Ansuz Acoustics Diamond
Power conditioners: Synergistic Research Galileo LE, Technical Brain
Accessories: Stein Music H2 Harmonizer System, Synergistic ART and HFT/FEQ system, Shakti Hallographs (6), Zanden room treatment, A/V Room Services Metu panels and traps, ASC Tube Traps, Critical Mass MAXXUM equipment and amp stands, Symposium Isis and Ultra equipment platforms, Symposium Rollerblocks and Fat Padz, Walker Prologue Reference equipment and amp stands, Walker Valid Points and Resonance Control discs, Clearaudio Double Matrix SE record cleaner, Synergistic Research RED Quantum fuses, HiFi-Tuning silver/gold fuses

JV Talks with Gunther Frohnhoefer of Acoustic Signature

There has long been a dispute—and not just in turntable design—about the use of "mass" and/or constrained layer materials to damp resonance, as opposed to the use of a spring suspension and/or a lighter-weight frame. The Invictus may be the ultimate example of the use of mass and constrained-layer damping in a record player. Why did you take this approach? What do you feel are its advantages? And do you feel there are any tradeoffs (other than sheer weight) vis-à-vis suspended or lightweight designs?

We have done high-mass turntables for 20 years now, but the Invictus takes a new approach. At a certain level adding mass simply doesn't help to get real improvement. Cleverly designed regular-mass turntables have reached a level of quality that can't really be overtaken by just adding more weight.

The approach in the Invictus was to combine existing technologies into one state-of-the-art unit. We searched for a clever combination of all of them: mass where it helps the Invictus from vibrating; Finite Element Design to the plinth to make it rigid but also able to absorb energy; damping added to the platter by the "silencers," which reduce resonances extremely well; and the sandwich construction of the platter, which in combination with the resonance-absorbing silencers, makes it quite dead but also able to absorb energy it sees from airwaves caused by loudspeakers. The platter also damps the vinyl itself, which is bonded to it and absorbs a lot of the vibration caused by the needle in the groove. This vibration is inside the material and bounces forward and backward, affecting the stylus.

Lightweight turntables claim to get rid of resonance very quickly, so the resonant effect should be small. That's the whole argument. But it is only part of the truth. Light construction is very easily affected by airwaves and other vibrations. Now, maybe these 'tables can get rid of resonances quickly, but the sheer *amount* of vibration they need to handle is much greater than with a cleverly engineered high-mass design. So their advantage gets killed at the start by the amount of resonance they need to get rid of.

Your massive platter uses three tiers of aluminum and brass, as well as brass inserts ("silencers"). Why did you choose this combination of materials?

We choose the sandwich material because we had great results measuring this combination. Combining two different materials always leads to a change in resonant behavior. Here we bonded them together with a huge number of screws so they are well connected. And the combination of both materials measurably dampened resonances by about 25dB, which is a lot. Nor did the damping make the sound boring or slow. As the found solution of the silencers and the sandwich was way better than the non-sandwich approach, it was a must for the Invictus.

Tell us about your Tidorfolon bearing. What is it? How does it work? What are its advantages compared with other more conventional oiled ruby-and-thrust-plate and magnetic designs?

We believe in three things: God, physics, and our Tidorfolon bearing design.

To make a long story short, we believe in three things: God, physics, and our Tidorfolon bearing design. In the end, any oiled ruby/thrust plate design with a heavy platter faces the wear problematic. You can put as much oil in as you want at the real touching point where the ball and the thrust plate contact each other, but the pressure there is so high (because of the weight of the platter and the very small surface of the ball) that the oil gets pressed away—and this causes deterioration. Also this combination is very sensitive to handling. If the platter drops down a little bit while it is being placed onto the bearing, you get a defect.

So why is the Tidorfolon bearing better? It's a combination of materials that is hard enough to not be affected by the high mass of the platter but that also has lubrication inside its material mix, so no oil is needed. Lubrication is always there where it's necessary and can't be pressed away. Tidorfolon is soft enough to handle a "dropped platter" without damage to itself or the platter. As a result, small customer installation mistakes have no effect.

For the record, we are strictly opposed to inverted bearings. The main source of noise inside a bearing is at the turning point of axle and thrust plate. This source of noise is about 4 inches away from the vinyl when using a conventional bearing, so moving this source of noise directly below the vinyl close to the cartridge makes little sense. Inverted bearings were mainly created as a marketing ploy to sell something new—not because of any sonic advantage. Adding to the problem is that with an inverted construction the oil at the contact of ball and thrust plate is floated away by gravity, creating even more lubrication issues. Then they invented a construction that pumps the oil from the bottom back up to the touching point. Super idea but only needed

Continued: JV Talks with Gunther Frohnhoefer of Acoustic Signature

because of the wrong design at the start. Also this construction needs more gap between the axle and the side bearings to work properly. So the platter is less stable in the bearing.

As for magnetic bearings. Great idea—and, yes, they improve upon existing inverted-bearing constructions. How? They lower the pressure on the touching point of ball and thrust plate. This reduces noise, which is, of course, a problem because the source of noise is now directly below the LP.

I am not against inventions and improvements, as you know, but this is the high end not marketing. All inventions that make the sound better are okay. But many of these inventions are needed because the initial design was wrong, and though these inventions help to make the problem less severe, the results are still worse than they would be with a normal old-fashioned bearing construction. The whole thing is like "improving" a round tire into a square one, and then selling you a super-duper electronic and mechanical system that is able to take out the vibrations that the square tire produces when you're driving. Genius invention, but in the end a round tire does the same thing because physics says it is the right design!

I am not against inventions and improvements, as you know, but this is the high end not marketing.

Recently direct-drive has made a bit of a comeback. But the Invictus uses a belt. Why did you make this choice? Why do you use six motors to drive the belt? Also tell us about the high-tech digital speed controller that you use and the affect it has on the sound.

Yes, I know there has been a little comeback of direct-drive motors. Invictus is a cost-no-object product. If we had thought a direct-drive motor was significantly better, we would certainly have made the investment to design it. But, as I said before about bearing construction, true innovation and marketing are two different things. Yes, you can get better wow/flutter values with a direct-drive motor of high torque. This is the truth and nobody can deny it. Not even me. But at what price?

To begin with, a direct-drive motor is expensive. Great AC motors are readily available in Europe at reasonable prices. Direct-drive motors need to be produced in small quantities at high prices. Even then vibration and electronic/magnetic hum are serious issues with direct-drive motors, and fixing them requires extra work and money. Of course, these are technical issues that may not disturb anybody but a top-of-the-line customer or a reviewer with bat ears! And they can be solved, but to what advantage?

Consider the results we get with a cleverly designed belt-driven-motor like the one we have in the Invictus. Why six motors? Simply to get reasonably fast speed-up time of the platter. We use six motors combined in sets of three driving one belt each. So the Invictus is driven by two belts. The motors in each set are positioned at exactly 120 degrees vis-à-vis each other, so we eliminate the tension a normal belt applies to the bearing. Adding the second set of three motors in the same layout increases the torque for speeding up the heavy 32-kilogram platter of the Invictus. For the first 10 seconds we supply maximum power to all six motors. The result is a speed-up time of less than 10 seconds. (We could have done this quicker, but then the wear on the belts would have affected their durability. Now a set of belts should last three to five years.) After the 10-second start-up, we lower the power to the motors to about 30% of what they can supply. At this point we only need enough energy to keep the platter spinning at the right speed, and this is way less than what was needed to start the platter rotating. The result of the lowered power is reduced vibration and smoother running.

The motor controller is equipped with a microprocessor that detects the amount of DC ripple on the motor power train. It automatically adjusts the phase shift for the motors to lowest vibration. The result is that you won't feel a difference in vibration if the motors are spinning or not; we've simply got them to a point where they don't vibrate anymore. The controller electronics also have enough computing power to calculate the sinewaves for the motors continuously online. This is not like an oscillator that swings with a preselected frequency. Here we do that continuously, and this sinewave gets amplified by a fully digital output stage to power the motor. All this works with quartz stability and without producing heat.

But, yes, the direct-drive motor will still produce better wow/flutter values because we use belts, and belts are worse in wow and flutter than a direct-coupled motor. Still, the wow and flutter of an Invictus are low enough that you need to measure your measurement system to verify the results.

Normally a 3150Hz tone is used for measuring wow and flutter. However, if the center hole of the record is minimally off-center, you cannot achieve a stable 3150Hz tone no matter how perfectly your 'table spins. With a true 3150Hz tone, the wow-and-flutter values of an Invictus are around 0.05%. That is what this measuring method can report if all is perfect. However, with real records, which are not pre-selected to have perfect geometry values, the wow-and-flutter results are way way worse *for all turntables*, regardless of how they're powered.

So, yes, direct drives may have better values in principle, but you simply see/hear no advantage of those better values in real life because of these centering issues. Plus, you still have to cope with the problems of higher prices, magnetic and electric hum, and…did I ever mention that innovations are great if they improve the sound? Here that is not the case. So we stuck with the custom-made synchronous motors we use. tas