

ABSOLUTE ANALOG



Kronos Sparta Turntable

A New Concept in Turntables

Greg Weaver

Kronos Audio burst onto the scene some four years ago, the brainchild of one Louis Desjardins of Montreal, Quebec, Canada. Louis studied science at Concordia University in Montreal, with a primary focus on the physics of waves as applied to both light and sound, particularly how those waves and vibrations were transmitted, reflected, and shifted when passing through different materials. He then spent 20 years working in optics and high-resolution photography with major clients such as BMW, Nissan, and Toyota.

Some ten years ago, while acknowledging a lifelong passion and fascination with audio, he found himself modifying turntables. It was only natural that he began applying the principles he had learned during his studies in optics. After discovering an article describing the decidedly negative impact that torque forces generated by a rotating platter have on the plinth of a suspended turntable, and by experimenting with drive and suspension designs, he soon realized that conventional solutions neither addressed the problem completely, nor at the source.

It seemed obvious to him that the correct approach would not be to try to dampen such vibrations, but to eliminate them entirely. The only sure way to offset the torsional forces, forces which then load the turntable's suspension to the detriment of fine detail, tonal purity, focus, and resolution, would be to have two platters of the same mass, counter-rotating at the same speed, using the same bearings and motors—a clear application of Newton's second law of motion.

His next step was to develop an experiment and build a prototype to verify this hypothesis. Over a two-year development period, he worked rigorously to implement all the lessons he had learned about drive systems, materials, bearings, and suspensions, tuning and refining every sub-system. With the exception of con-

sulting with Labb Technologies to develop the DC motor controller, Louis was responsible for every other aspect of his turntable's design.

Upon first playback, the advantages of contra-rotation and the refinements and optimizations he had implemented became plainly apparent. Excited to share what he had accomplished, he auditioned his prototype for René Laflamme, CEO, producer, and sound engineer at Montreal's Fidelio Music. That initial demonstration pitted a test pressing of the label's recent release of Holst's *The Planets* on the prototype Kronos, compared head-to-head with the analog mastertape. René was moved by how closely the performance of the vinyl playback system mimicked the characteristics of the mastertape, so much so that he asked to use the prototype turntable at the Montreal Audio show in 2011 to launch this particular recording. That introductory performance was such a resounding success that Louis decided to manufacture the turntable, initially as a limited edition with a run of just 250 units. That run was so successful that the name was changed to the PRO and the company we now know as Kronos was established. The PRO saw its first official showing at CES 2012.

The Sparta was developed during 2013 and introduced at CES 2014 as a way to offer the lion's share of the sonic advantage the \$38,000 PRO brings to the party at a lower price. Once the decision was made to offer a more affordable variant, certain decisions had to be made to maximize the effectiveness of the necessary compromises.

The result was that the same motors (initially), suspension, counter-rotational scheme, and bearings were selected. However, the plinths and platters are of different construction, as is the DC-motor-control system. While the Sparta's plinths utilize the same materials as the PRO, it is a simpler application with simpler finish-

ing, resulting in manufacturing efficiencies that allow lower production cost at the price of somewhat lower vibration damping. As of January 2015, the PRO uses a newer, costlier DCX motor. The Sparta maintains the implementation of the original motors used in the PRO, providing more than adequate operation within its performance envelope.

The Soul of a New Machine

Unique to behold, the Sparta is essentially two complete turntables—each including a skeletal, metal-framed plinth fabricated of solid aluminum boards with phenolic inserts—one situated immediately above the other. Both hang freely from the same, patented, four-post, pillar suspension system. Occupying a space some 20 inches wide, 14 inches deep, and 11 inches tall, and weighing 70 pounds, the Sparta comes in at less than half the weight of my reference Redpoint Model D, yet with a similar overall footprint.

Like most suspended tables, each bearing set for the platters is positioned slightly left of the physical center of the plinth. The Sparta shares the same bearing system as the PRO. When Desjardins was designing and building these bearings, his object was to provide the quietest operation possible, yet still maximize service life. The in-depth design process included extensive research into the alloys and vapor-deposited coatings used in the aerospace industry. Settling on an inverted-bearing design to reduce contact in the rotational plane and to lessen torque-induced drag, he employed double hydraulic insulation to achieve the highest dampening possible. The bearings are hand-lapped and described as having tolerances to within one-thousandth of an inch. Kronos claims that the result of this design yields the lowest noise floor yet encountered in an audio turntable.

A pair of high-quality, Swiss-made Maxon DC motors, originally developed for the space program, are used to deliver quiet, smooth, linear power to the platters. The lower plinth has its brushless DC motor mounted to the right of the platter, while the upper plinth has it mounted at the equivalent location to the left. The choice to place the motors 180 degrees opposed was made to offset and “equalize” any oscillation that the torque they generate might produce.

Both plinths are suspended from four round corner towers that feature a central piston, attached via screws (accessible for setup) to a top cap fitted with elastic O rings. Each corner tower hangs freely from this cap, affording unrestricted motion in both the horizontal and vertical planes, and each pillar is terminated with an adjustable footer.

Thin round belts, approximately 1mm in diameter, go around each pulley atop the motors, and then around the outside perimeter of each respective platter, both of which are fabricated of multi-layered, multi-material composites, topped by a carbon-fiber mat.

The easily adjustable armboard attaches to the top plinth and, with the loosening or tightening of one large screw, may be freely adjusted forward or backward, then securely locked in place. The result is two completely independent, isolated turntables, mounted at a fixed distance from one another on the same suspension, with identical platters and motors, running in opposite direction, at the same speed.

Two control cables—each about three feet in length to facilitate convenient placement of the controller, with different pin configurations so they cannot be mistakenly interchanged—run

from the back of the bottom plinth to the back of the 4-inch-wide, 4½-inch-deep, and 3¼-inch-tall controller/power supply. A third rear connection allows for an optical strobe cable for speed adjustment. The IEC socket is at the lower left corner of the back. By default, the Sparta also includes single-ended (RCA) connections, also accessed from the back of the lower plinth.

This controller/power supply provides DC voltage to the twin motors using a CPU-controlled, fully regulated Class A dual power supply. Rather than using pulse-width modulation, which can produce jerkiness, the CPU receives speed readings from the top platter via an optical sensor (the PRO uses four of them) and adjusts voltage to the motors in real time. The lower platter speed is not individually controlled, as it is with the PRO; it shares voltage with the top platter motor and is calibrated in the analog domain. As speed stability is dynamically monitored and addressed, Kronos claims greater stability and accuracy over the life of the turntable, regardless of environmental factors, belt-stretching, or mechanical wear.

The controller’s silver face, etched with the Kronos logo beneath the Sparta name, features an on/off rocker switch in the lower right, and three toggle switches across the top. From left to right, these silver toggles manage RPM selection, 33 (up) or 45 (down), speed adjust + (up) or – (down), and a memory switch, to allow storing the final speed selections. Speed control on the PRO is completely automated.

My Sparta was fitted with the 10.5-inch, tapered-tube, carbon-fiber Helena tonearm, which, along with the 12-inch Black Beauty ’arm, is the design of André Thériault of Montreal. Both ’arms are ball-in-cup, unipivot designs, featuring a twin-wall, tapered, carbon ’arm tube for maximum rigidity and minimum mass. The counterweight hangs well below the back of the ’arm, significantly lowering the center of gravity. Louis assisted in finalizing the tonearm design, primarily in making it more consumer friendly. And while the two tonearms are nearly identical save for their effective length, Louis feels that the 10.5-inch is a better fit for the smaller footprint of the Sparta, hence its inclusion for this review.

Applied Physics

To someone with an engineering bent, the Kronos contra-rotating platter design makes perfect sense: Think of the 1982 Kamov single-seat Ka-50 “Black Shark” or 1997’s two-seat Ka-52 “Alligator” helicopters. These Russian-made attack helicopters were the first production non-fixed wing aircraft to feature a contra-rotating coaxial rotor system, employing a pair of rotors mounted one above the other on concentric shafts with the same axis of rotation, but turning in opposite directions (contra-rotation). This configuration affords several serious advantages in an airframe application, the most significant of which is the elimination of torsional forces.

Helicopters using a conventional single set of rotor blades exert a tremendous amount of torque (rotational force) on the helicopter fuselage. This torque causes the fuselage to rotate in the direction opposite the direction that the rotor blades turn, resulting in the necessity for a second rotor, the anti-torque, or tail, rotor. This second rotor’s sole purpose is to counteract the main rotor’s torque, opposing and countering, not defeating, the tendency for fuselage rotation.

Coaxial-mounted, counter-rotating rotors solve the problem of main rotor torque by turning each set of rotors in opposite directions. The opposing torques from the pair of rotors effectively

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cancel each other. Further, by eliminating the need for the torque-counteracting tail rotor common to all single-rotor, non-fixed-wing aircraft, up to 30% of the engine's power can be recovered to the motor's main purpose, providing greater lift and better maneuvering, with no increase in weight or displacement.

On the greatly reduced scale of our turntable application, the elimination of torque unloads the torsional forces that would otherwise be loaded in the turntable's suspension system, and, as we shall soon learn, allows for the unleashing of a wealth of fine detail, tonal purity, and resolution that were, in my experience, previously unobtainable.

The Kamov helicopters are a clear analog of the reduction of adverse energy that this two-platter, contra-rotating turntable configuration affords. If, in the larger scale of a non-fixed-wing aircraft, employing just one rotor requires nearly one third of the motor's power merely to try to counter (but still not eliminate) the torsional forces being transferred into the airframe, imagine the potential damage that might be done by that rather significant, yet unnecessary and undesirable, energy being stored in the suspension of a highly sensitive playback platform like a turntable!

According to Kronos literature, the energy produced by the torsional forces of a typical single-platter suspended turntable manifests itself as a natural tendency for the sub-platter frame to rotate in-sync with the platter. Although this rotation is controlled and absorbed by the suspension springs (or some similar elastic suspension mechanism), with the suspension maintaining this much more highly energized state of equilibrium, the slightest vibration coming from the stylus as it transcribes the LP groove is echoed back to the stylus, but out of phase. This, according to Kronos, results in a blurring and distortion of the stereo image. In essence, critical musical information is permanently destroyed.

An entirely different approach, one that has wantonly abandoned the more widely accepted suspended design methodology championed by a large number of manufacturers, favors building massive, rigid turntables, completely devoid of any suspension system whatsoever. Seemingly endless research into, and application of, alternative constituent materials has further elevated the sonic performance of this group of mass-based turntables. My reference Redpoint Model D is a prime example of this kind of thinking, and, overall, is a highly effective approach, especially in the lowest octaves.

But such "suspension-less" designs are still susceptible to the vibrations produced naturally by other mechanical components and other vibrations disturbing the listening environment. Those sympathetic vibrations can be fed back to the platter and tonearm, causing yet another type of blurring and distortion of the music signal, one often perceived as having a harsh, aggressive, and edgy sonic nature. As you may have come to realize, both approaches have their own set of advantages and detriments. Like everything else in our hobby, it often comes down to a choice of compromises that are least offensive to the individual listener.

Heavy Rotation

I had the good fortune and pleasure of having my Sparta and Helena delivered and set up for this audition by Bill Parish, owner of GTT Audio & Video and U.S. distributor of Kronos products. Bill joined me at my home right after my day at work, and after some conversation, meeting my herd of canines, and schlepping the gear

down into my man cave, Bill dug in and started the set-up process in earnest.

Because the Kronos philosophy is to install its platform only on solid, non-articulated stands, and because I use the Grand Prix Monaco Isolation Platform (and amp stands), Bill had brought along a small, standalone, rigid stand for the installation. While I was not sure that this was the best path to take, I was only too happy to comply—at first. More on this soon.

The turntable proved to be surprisingly straightforward to set up, and Bill was done in a matter of an hour and a half. Soon after, we were sitting back spinning a few test tracks to get a taste of what this little upstart could do. The use of a separate stand and the availability of multiple inputs on the phonostages I had on hand afforded the opportunity for direct comparison to my reference analog setup. For the first several days, my reference system won handily, especially in bass impact, tonality, pitch, and overall rhythm; all in all, not an uncommon result when comparing a well-run-in reference system to a "cold" table.

While I could have just let the Sparta's motors running unattended to facilitate the run-in process, I chose to not take that route; I wanted to hear it mature and see what that might sound like. After a couple of days (cumulative, not calendar) of run-in, its attributes really began to impress me. During this period, I had time to assess the individual contributions made by two different 'arms (the Tri-Planar Mk VII Precision versus the Helena) and high-output moving-coil cartridges (the Transfiguration Temper V versus the Air Tight PC-1), and in fact, I swapped carts for several days just to verify my assessment. To my ears, the run-in process took a bit longer than I have come to expect. But the results justified the extra wait.

Once the Sparta had found its footing, I was still not sure that I was hearing the best it could deliver. Since I had done my due diligence by listening to the Sparta on the rigid stand, after about 40 days I decided to move it to the Formula shelf atop my Monaco, removing my Redpoint Model D and installing the Sparta in its place. This was to prove a *crucial* move, as it was only then that I really began to appreciate the remarkable virtues of this table.

Once relocated to my isolation stand, *everything* improved—and dramatically so. Perhaps the easiest way to give you a sense of what the Sparta was then bringing to the mix would be to say that it was as though a previously unnoticed veiling or smearing had been somehow circumvented. There was a surfeit of new-found clarity, focus, and specificity to instrumental voices, staging, and imaging.

SPECS & PRICING

Type: Belt-driven turntable, contra-rotating, dual-platter design

Speed: 33/45rpm

Dimensions: 20" x 11" x 14"

Weight: 70 lbs.

Price: \$21,500 (Sparta turntable); \$6500 (Helena tonearm)

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One of the reasons I had moved to the suspension-less, mass-based turntable camp, after decades with the Linn and Oracle platforms, was the seemingly unshakable pace, rhythm, and bass authority they are capable of. Honestly, until the Sparta had run in and been moved to my Grand Prix stand, the Redpoint handily bested it in those departments. After the move, the Sparta asserted itself, leaving no doubt that it was far and away the new champion. Though both were equal in bass extension, in definition and pitch the Sparta was treating me to newfound detail, dimension, and definition.

Midrange showed wholesale clarification and refinement. Fundamental pitch and tonal color were more honest and faithful. Massed strings, acoustic guitar, piano, even brass instruments were more alive sounding and richer in tone, with more clearly rendered texture. Instrumental bloom was more apparent and believable, with voices sounding much more authentic in size, texture, and especially tonality. I was struck by the improvements in timbre; everything seemed to be not only more natural sounding (as though some coloration or artificial harmonics had been removed), but pitch was also noticeably more stable.

The way the Sparta handles the top four octaves was every bit as remarkable. With the best recordings, the newfound air and space up top was invigorating, with enhanced decay and remarkably life-like shimmer and sheen—all with no etching, glare, or grain.

Something seemingly unique to the Sparta's sonic signature in my experience emerged—something I can best describe as a deft agility. It seems to reconstruct fine detail and micro-dynamic

events more accurately—sounding as if it were somehow faster and more coherent. It offered a clearer, more articulate, more incisive voice. I was hearing more—more clearly delineated spaces among instruments, more highly focused and concise images, more succinct fundamental tone, more faithful timbre, and richer, fuller, more authentic texture.

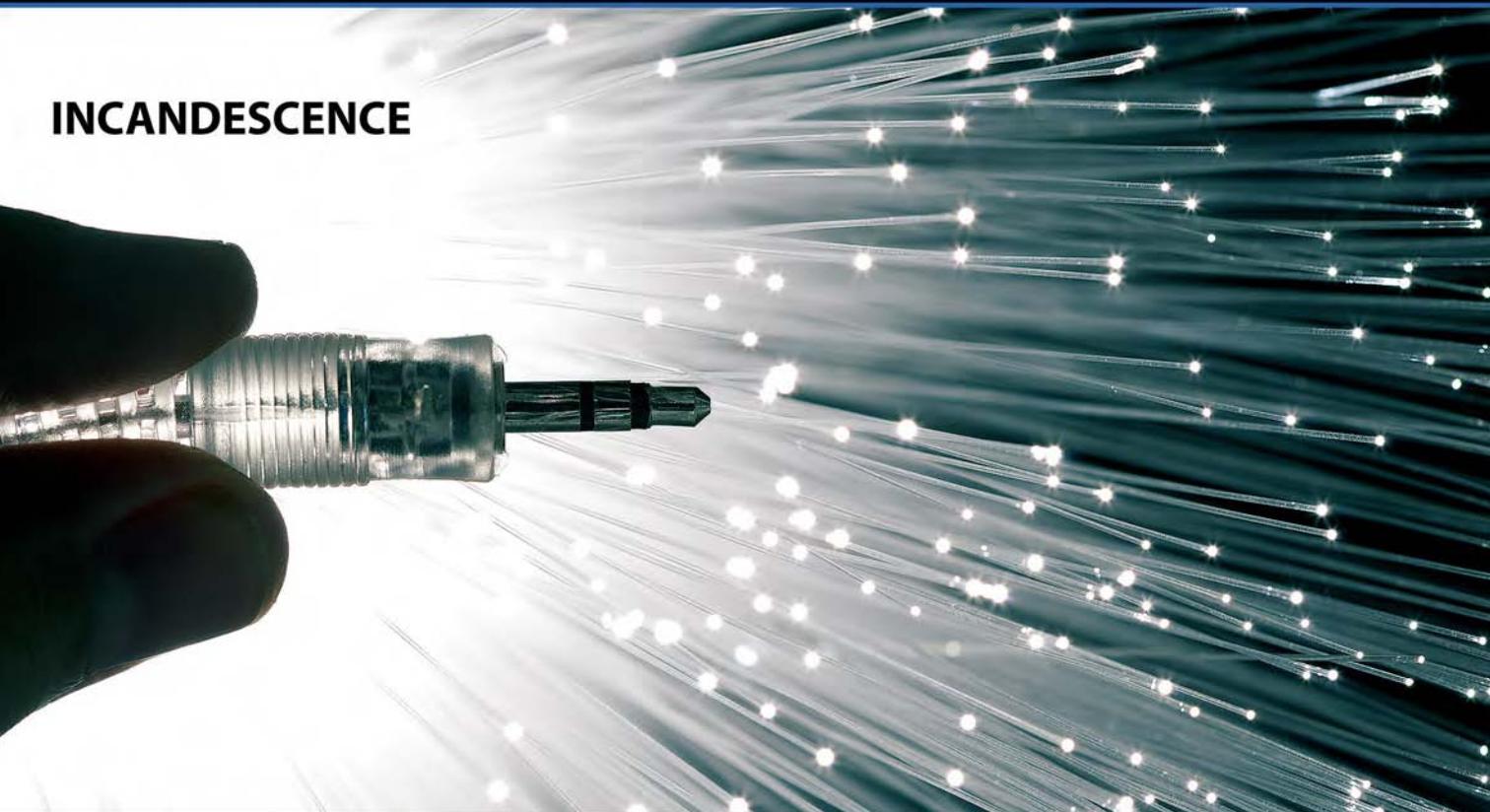
One of the results is that “more” space is revealed, and that increased space is more open, tangible, and vivid. It is almost as if a previously undetected pall of smoke or mist had been removed from between and around every instrumental voice. Spatial queues were more specific in location, more accessible, and clearly discernable. It really was remarkable. Virtually every sonic attribute seemed somehow more refined, more honed, brought into clearer focus, and more lucidly delineated—most easily noted with dense or busy arrangements.

With the Sparta, records I've been listening to for decades were given new dimension, increased focus, enhanced clarity, and more credible tonality. I admit to being totally unprepared for what the Sparta was saying to me; it clearly shattered all my expectations and preconceptions, leaving me completely entranced with its sonic virtues.

When I first learned that I would be reviewing the Sparta, my initial concerns were focused on what complications might arise from the greater complexity of using two complete 'tables—specifically, the potential for an elevated level of noise and vibration generated by using two pair of motors, drive systems, bearing sets,

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and platters, the doubled (or worse) harmonics from two plinths, and the likely sonic detriment that a possible escalation in self-generated system noise and vibration might introduce.

While the Sparta's dual motor/platter/bearing system is undeniably noisier than that of many other turntables in my experience, and is in fact fairly distracting when you are proximate to the table, the bulk of that noise seems to emanate from the motors themselves. I was quite concerned about this, initially. Yet at my listening distance (my listening chair is some 12 feet away), the motor noise was virtually imperceptible; and with music playing it was entirely inaudible.

Further, if there were additional sources of sonic contamination created by this decidedly more complex system, they were effectively being managed in a way that did not negatively affect any part of the Sparta's overall sonic signature. My take-away is that the Sparta design, as complex as it is, is extremely well thought out and effectively executed. With the exception of the louder-than-normal motors, I have to give Louis credit: System noise, including the bearings, platters, and suspension, is remarkably low, and backgrounds are extraordinarily quiet.

Wrap It Up

I've been playing with turntables since my childhood, and I've been setting them up and modifying them since the early 1970s. While I've heard the Kronos PRO at shows since its introduction, it has mostly been in systems with many other components (in-

cluding stands, cables, and conditioners) with which I was unfamiliar. Though it has always presented very well, given the conditions, I could never be *exactly* sure that I could ascribe the performance I heard to the Kronos PRO only. Such is the nature of show reporting.

However, now that I've had the Sparta on hand for some months, and have had time to really get to appreciate its remarkable contributions, I have been supremely impressed. Not to minimize any of the other optimizations and enhancements that Louis Desjardin has integrated into the Kronos tables—the high-performance motors, the precise bearings, the compound composite construction of both the plinths and platters, and the patented suspension system—but I believe that it is the implementation of the dual-platter, contra-rotational concept that has the most substantive effect in the Kronos design, and as such, is the single most significant development in turntable design in decades.

Honestly, once seeing and understanding it, as forthright and fundamentally simple as the idea is, it seems almost shocking that someone didn't think of and apply this principle sooner. It is a game-changer. After living with my Redpoint Model D for seven years, and having steadfastly held off all other comers in its price range and above, I have traded in my Redpoint and now own the Kronos Sparta and Helena tonearm as my reference analog system. And I've never before been treated to vinyl playback from any system I've owned that is as clearly and profoundly moving as what I am now hearing. tas

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