

# Graham Phantom B-44 Tonearm

REVIEW by Wayne Garcia Nov 25th, 2008

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Veteran TAS readers and analog aficionados need little introduction to Bob Graham, who has been building variations on his unipivot tonearm design since 1990. That was the year Graham Engineering released its model 1.5—a beautifully machined and excellent sounding unit that firmly established Graham as one of the world’s premier tonearm builders. From the start, Graham’s unipivots were known for their nuanced bass, silky highs, excellent detail, and highly controlled sound. For some, though, the sound was too controlled. And while praising its strengths, many listeners found the Graham lacking in deep bass and dynamic excitement. For a decade and more Graham pushed the design through several iterations: from the original’s aluminum and stainless wand, through tungsten and ceramic incarnations, as well as other modifications that tended to focus on bettering the arm’s deep bass extension and dynamic pop. Graham was successful. Each change did improve these areas of performance, while also tightening image focus and opening up the soundstage. But after reaching the model 2.2, it became clear to Graham that he’d exhausted the limits of the series, and he decided that an entirely fresh approach was in order. His research would continue for the next two years.

“My best ideas tend to come while I’m in the shower or while driving,” Graham recently told me. “I’d ask myself, ‘What would I radically change about the arm if I could?’” Graham knew that he didn’t want to sacrifice the detail and smoothness that his arms are known for,

but he did want to take the dynamic performance to a new level. “The ideal tonearm would be sonically invisible,” Graham said, which prompted me to ask if that’s what inspired the name “Phantom.” “Actually, my wife Justine coined that one.” And the B-44 part was intended to evoke some kind of military aircraft? “Yes,” said Bob, “in a way. I like the idea of something quick yet potent. But that designation is really a silent homage to my late brother Bruce, who was born in 1944.”

Two thoughts kept recurring to Graham throughout the prototype stage. First, his new arm would need to be built with even greater structural rigidity to further suppress resonance and better manage “energy flow.” The result was a significant beefing up of the junction point where the removable arm wand threads onto the arm’s main assembly. In addition, the Phantom’s arm wand is slightly larger in diameter than those found on Series 1 and 2 arms. Like those units, the wand is progressively extruded to minimize standing waves, and it’s made of the proprietary Lorzig-ceramic material Graham developed for the 2.0 (this glass-overlay process provides “extensional” damping and also adds to the arm’s elegant appearance).

Returning to that removable wand momentarily, although not all Graham owners will choose to use multiple cartridges, those who do will find what is surely the cleverest solution to the old convenience vs. performance conundrum. The new connector is nearly half-an-inch in diameter—almost twice as large as the older version—and the junction point is so strong that it is said to effectively amount to a single-piece assembly, while making it relatively easy for those who own multiple cartridges (and wands) to swap them out. For a reviewer this is a dream, and I took advantage of it to audition the Phantom with four different moving-coils (see the associated equipment list below). The connectors are made of “high copper-content phosphor bronze,” which Graham says is not only a better conductor than brass, but also one that will retain its original shape, tension, and strength over time.

Graham also likes to emphasize his arm’s neutral balance system. “There are three different ways to static balance an arm” Graham said, “neutral, stable, and unstable.” Stable balance, the kind typically found in lab scales, results when a moving system’s center of gravity occurs below the pivot point. Unstable balance, which Graham says is wholly undesirable for a tonearm application, happens when the center of gravity is above the pivot point. (When an arm is moved from its rest position, stable balance will create an opposing force in the attempt to move the arm back to the rest position, while an unstable balance results in a reduced force as the arm is lifted.) In a neutral balance system, such as the Phantom’s, the pivot point and center of gravity are in exactly the same plane, so when the arm is raised or lowered there is no opposing force. “As a result, Graham continued, “the only downward tracking force is provided by the counterweight, and there is no change in VTF as the arm and cartridge track our less-than-flat records.”

Other improvements to the Phantom include new internal wiring, and, of great importance, Graham’s trademarked “Magne glide” stabilization system. A classic problem with unipivot bearings is that their single point of contact generates a “rolling” effect, in which the stylus literally “rolls” side to side within the groove walls (for more on the subject, see Robert Harley’s interview with Basis Audio’s A.J. Conti in our last issue, who described the

phenomenon as “azimuth error”). As one can imagine, this wreaks proverbial havoc on the sound. Many unipivot arms, including earlier Grahams, used side weights to provide lateral stability. Graham’s MagneSlide uses tiny but powerful attracting neodymium magnets that are located in the same plane as the arm’s pivot point. According to Graham, the adjustable MagneSlide system provides not only lateral stability, but azimuth correction, true vertical positioning of the stylus tip with no “rolling” whether the stylus is in the groove or raised, resonance damping, as well as mechanically decoupled, magnetically applied anti-skate correction for the entire tonearm assembly.

Like many turntable and arm designers, Graham is a firm believer in physics and good engineering. “Although there are novel concepts in the B-44, they are all based on careful research, with proven and repeatable results,” is how he left it at the end of our talk.

For a variety of reasons this review had an unusually long gestation period, which is always a welcome (if rare) luxury with components that are pushing the state of the art. This is particularly true with analog components, which, no matter what their makers may tell us, are generally not by nature “plug and play.”

For the first part of my evaluation period, the Phantom was the sole arm in my system, mounted on the Redpoint Model D turntable (which I’ll review next issue) and used with the Transfiguration Temper V, Shelter 90X, and Air Tight PC-1 cartridges. The sound was consistently neutral and revealing of the Temper V’s detail and smoothness, the Shelter’s exciting if slightly less refined qualities, and the Air Tight’s extraordinary speed, dynamics, presence, and transparency. I also found the Graham to track magnificently, its bass to be anything but shy, and, all audio-speak aside, it prompted lengthy listening sessions.

For the last six weeks of the process, Redpoint’s Peter Clark generously supplied me with a second arm pod. On this I mounted the Tri-Planar Mk VII that’s been my reference for the past few years, and Profundo’s Bob Clarke was gracious enough to send me a pair of identical Transfiguration Phoenix cartridges. This is the first time I’ve had the chance to use identical cartridges mounted on two arms on the same turntable. And it was a fascinating experience. Because once I’d set the Phoenixes up in each arm (the Feickert Universal Protractor was an essential tool here), set the VTA and VTF as identically as possible, and the cartridges had settled in, I was able to push the performance of each arm further than I know I would have been able to without weeks of constant back-and-forth listening sessions.

For the remainder of this review I’m going to try something a little different. Since the Tri-Planar has long been considered one of the finest fixed-bearing arms, and the Graham one of the finest unipivots, and since both are Americanmade and sell for essentially the same price (\$4400 and \$4300 respectively), I’m going to describe those back-and-forth sessions, how the arms morphed in sound, and where I feel each has the edge.

For music, I succumbed to a wellknown audiophile-fave to start off with—the sonically stunning but musically cheesy Classic Records 45rpm set of The Royal Ballet. Listening to

The Sleeping Beauty section, the Tri-Planar sounded highly focused, staggeringly quick, and explosively dynamic. It threw a huge soundstage of impressive width, depth, and height, and expressed convincing cushions of air around the instruments (check out that brief solo harp), all with a notable lack of groove or other mechanical noise. By comparison, my first round with the Phantom found an arm of unsurpassed smoothness and elegance, with the silkiest string tone I've ever heard. But the soundstage was slightly tight, and the arm lacked the transient speed, dynamic explosiveness, and sheer excitement provided by the Tri-Planar.

Guessing that the Phantom probably had more damping fluid in the bearing cup than is ideal, I unscrewed the cap, confirmed my guess with a visual inspection, and scooped out a dollop of the blue damping fluid with a Q-Tip. Sure enough, the arm became much livelier than it had been, without losing its smoothness. I also re-checked VTF, and discovered it was about one-fifteenth of a gram lighter than the Phoenix's optimum two grams of tracking force. Dialing the counterweight a touch forward, I was able to get a consistent two-gram reading on Acoustic Sounds' digital stylus pressure gauge. This made an even larger improvement. Now, the Phantom's soundstage matched the size of the Tri-Planar's (though the Phantom's is consistently slightly recessed from the plane of the speakers, while the Tri-Planar's is more up-front), focus locked in, dynamics improved mightily, and this was just the beginning of my little journey.

Neil Young's Greendale [Classic/Reprise] is a great and great-sounding modern rock recording. Starting this time with the Phantom, I was all but knocked over by the clarity of Young's vocal, which had so much air around it that it sounded as if it was recorded in a separate booth (as it may very well have been). The speakers seemed to fade away, and there was great clarity to all the instruments—from the funky, rollicking Crazy Horse rhythm section (the drums were especially propulsive, rhythmic, and defined, and cymbal crashes pure and natural), to Young's highly distorted electric guitar, which came across with such dense harmonic complexity that it made me think of an electric orchestra (one using tube amps, of course). By contrast, the Tri-Planar was certainly more dynamically explosive, Young's voice was not as distinctly separate but more integrated into the mix (I have no idea which is more accurate to the recording), his guitar was raunchier and gloriously distorted sounding, the drum thwacks were sharper, and the whole thing rocked with greater swing.

But on the Bach "Chaconne," from Milstein's reading of the Sonatas and Partitas for Solo Violin [DG], the Tri-Planar's speed turned wiry and bright, and rapidly bowed passages were a tad ragged, if quite exciting. The Phantom's smoothness resulted in a more subtle and refined delivery of the performance, as single-note accents, spun phrases, minute dynamic shifts, and a sweet top end made for an articulate but never analytical sound.

More tweaking brought the two arms closer together—a slight addition to the Tri-Planar's fluid damping, a tweak of the VTA here, VTF there—yet each retained certain characteristics.