

GRAHAM PHANTOM II B-44 TONEARM

The Phantom B44 has been the recipient of the "Editor's Choice" Award from Harry Pearson (October 2006 issue of TAS), a Class "A" rating from Michael Fremer, and runner-up for both Analog Source Component AND the 2006 Product of the Year award in Stereophile



New & Improved Graham Phantom II features greater performance in the areas of dynamics and sheer musicality!

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[Two years of research into design theory](#)

The original Phantom was the result of nearly materials analysis, and extensive testing. This involved not only testing of the individual design components as they were being evaluated, but also comparing the several prototype models against our own Model 2.2 and the available competitors.

Main features of the PHANTOM B44 are:

- the Magne glide™ stabilizer system,
- the use of a proprietary Swiss-made matched cup-and-pivot made of tungsten carbide (far stronger than any steel pivot) as the super-low-friction main unipivot bearing,
- a refined and far-improved removable armwand with our patented alignment system,
- an increased VTA height range with calibrated vernier scales,
- a wide range of cartridge weight compatibility (5-18 grams),
- two mounting profiles: the standard Graham Custom Mount and an SME mount
- the easiest and most accurate of all alignment systems.

[The Phantom II is exceeding even our highest expectations](#)



Compared to the original Phantom, the new Series II has a similar outward appearance, but has important internal differences. These include a refined Magne glide™ stabilizer, new internal wiring for even better detail and improved freedom from any mechanical resistance, an upgraded pivot design for even greater dynamics, and a new titanium armwand.

Together, these improvements yield greater performance in the areas of dynamics and sheer musicality, while retaining the features the earlier Phantom was noted for.

The Phantom B44 delivers an unsurpassed musical experience

The Phantom provides deep, detailed bass extension, silky-smooth inner detail, and dynamic impact that can be startling when the music calls for it; also, a huge (but not exaggerated) soundstage extending both side-to-side and front-to-back.

It delivers high-frequency response that is extended, detailed and sparkling; yet, it is exceedingly smooth, and not at all aggressive. The sound seems to float in space, just as one would have heard it at the recording session, and with a sense of ease and naturalness that is free from all sense of strain and effort, permitting hours and hours of pleasurable listening.

Why It has become a benchmark tonearm in design and performance?

We've suppressed resonances at every conceivable point.

This has been accomplished with exotic materials; for example, the arm tube has been refined with a slightly larger diameter that is progressionally-extruded (to resist standing waves in the tube) and precision ground.

A proprietary-process glass overlay, acting as extensional damping, is applied to further suppress resonances. (As a bonus, this black glass surface provides a fine-china appearance, complementing the other tonearm components).

The armtube itself, easily removable and using our patented alignment system.

This offers the safety, convenience and accuracy of off-turntable cartridge installation and alignment, as well as allowing quick interchange of multiple pre-mounted cartridges. It is significantly improved from the earlier armwands, and attaches to a nearly half-inch wide stainless-steel post-and-connector that supports the armwand under tension, resulting in virtually a one-piece armtube/pivot assembly with high damping.

The connectors use high copper-content phosphor bronze

In addition to being a better conductor than brass, this combination also has less "memory"; i.e., it won't deform as much with use, but will keep it's proper tension and mechanical strength over time. The internal wiring has also been improved, with purpose-made 4-nines silver incorporating both solid and litz construction, and with teflon and silicone insulation jackets for fast transmission speed.

We've addressed the all-important (and often ignored) area of dynamic balance.

- ***Tonearms should have as little inertia as possible.*** The Phantom, in spite of its robust appearance, has been designed with a very low moment of inertia, so that the majority of phono cartridges can be used with ease and maximum performance.
- ***The most desirable system for tonearms is Neutral Balance.*** With this system, the pivot point and the Centre of Gravity of the moving system are in the same plane. When the arm is raised or lowered, there is no opposing force trying to return the arm to a rest position; the pivoting system doesn't really know or care if the stylus is at the record surface level or a half-inch above or below it; as a result, there is no opposing force to the arm as it is traversing record deflection during play. The only downward tracking force is that of the adjustable counterweight, which remains constant.

☞ cf “A BRIEF DESCRIPTION OF BALANCE THEORY” hereafter

- ***The patent-pending Magneglide™ design*** achieves a high-load, chatter-free and virtually friction-free damped unipivot, combined with true Neutral Balance, and with the all-important geometric accuracy of correct vertical pivoting parallel with the face of the stylus tip.

With this unique system, all lateral stability, and a portion of the damping, is provided by powerful neodymium ("rare-earth") magnets, placed in a horizontal line from the pivot point of the tonearm. Working as an adjustable system, it provides, simultaneously, the following: lateral stability, azimuth adjustability, damping assist, true vertical pivoting of the stylus tip with no rotation as the arm is raised, and easily adjusted anti-skate compensation.

- ***The anti-skate system is completely independent.*** The Magneglide™ system also permits the application of anti-skate through the magnetic coupling of the design, thereby eliminating ANY direct contact or possible resonance to affect the main pivot assembly of the tonearm., mechanically, and is easily adjusted either by a thumb-wheel rotation or sliding motion (user's choice) of the bias weight for minute adjustments from near zero force to 3+ grams.

The Phantom is a true "drop-in" replacement

The Phantom was developed and tested on many fine turntables, such as the SME, VPI, SOTA, Basis, Clearaudio, etc. It is an improvement over any other tonearm, and the proof will be in the listening.

Claims - and counterclaims - abound in the high-end market (we just made a bold one!), and it can become confusing as to what's really correct; however, once you experience the Phantom II for yourself, we know you will agree that this is, truly, the finest tonearm we've ever produced and quite probably the best arm available today.



the Phantom...

*Detailed.
Dynamic.
Always musical.*

...Will dramatically improve any turntable.

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A BRIEF DESCRIPTION OF BALANCE THEORY

There are basically three types of static balance systems, **Stable**, **Unstable** and **Neutral**.

Stable balance, normally seen in laboratory scales, occurs when the CG (center of gravity) of the moving system is placed BELOW the pivot point. When this type of system is displaced from its preferred rest position, it will generate an immediate and opposing force which tries to return to that same position.

Unstable Balance, completely undesirable for any tonearm application, is when the CG is placed ABOVE the pivot point. A moving system with unstable balance will not have any stable position, and will exhibit reduced force as it's lifted.

Previously, all true unipivots - that is, those with a single contact point for the bearing and NO secondary stabilizing surfaces, bearings, etc. - required the use of side weights or a significantly lowered counterweight in order to provide stability. (And even those with a secondary stabilizing guide generally require a displaced CG in order to provide constant contact with the stabilizer guide piece). The drawback to both these conditions is that this design becomes a Stable Balance system, which is normally used, as mentioned, in laboratory scales for precision weight measurements. But laboratory scales have very different requirements than a tonearm. If **Stable Balance** is applied to tonearms, the arm will have a preferred rest position and always tries to return to this point; any change in tonearm height, as in tracking warped records, causes an immediate and equally opposing force that tries to push the arm back to its rest position. The higher the warp, the more counter-force is applied.

You can see that this force would work against the cantilever, deflecting it during warps and causing the magnetic system to be displaced. This, in turn, will certainly affect the reproduced sound, with diminished performance in all areas, including soundstage compression, loss of detail and dimensionality, not to mention record wear. This is why most tonearms must have their tracking force measured at the record surface level; any height change during the measurement will cause an incorrect reading.

A tonearm with **Stable Balance** can be identified by measuring the tracking force at the record surface level and again at a raised position above the record. If the tracking force INCREASES at the higher position, the arm has Stable Balance. Our own previous designs - the best we could make at that time - also had this limitation due to the use of side weights to provide lateral stability. We minimized the effect by placing the weights as close to the pivot as possible, but it was still measurable. Other unipivots with low-slung counterweights will also exhibit this force; the lower the weight, the more counter-force is applied. Although this technique is often promoted as a "high-stability" design, it does so at the expense of consistent tracking force. It actually results in varying tracking forces during play when traversing even small warps, accompanied by non-linear cartridge operation, and increased record wear.

If an arm were produced with **Unstable Balance** - although this approach should always be avoided in tonearms - such a design would actually cause the tracking force to DECREASE with arm height, and provoke serious mistracking as the arm is raised, as when negotiating warps.

While there are other possible approaches to stabilize a unipivot bearing - besides stable balance, previously discussed - these efforts require some sort of secondary contact surface within the tonearm, and thus are no longer true unipivots.

Although these quasi-unipivot designs can hold the arm upright, they do so at the expense of an additional bearing contact surface which cannot ever be properly loaded (the force required to maintain uniform bearing contact pressure, and to eliminate chatter) to the same degree as a vertically arranged contact point which supports the entire weight of the tonearm. With the secondary contact stabilizer, whether it's a ball bearing or guide plate, the unavoidable lower contact load thus opens the possibility for secondary bearing chatter from the system vibrations always present in turntable operation. In this regard, the Phantom offers the distinct and demonstrable advantages of being a true single-contact unipivot tonearm, while retaining absolute lateral stability under dynamic conditions.

Once **Neutral Balance** is chosen for use in a unipivot tonearm, one must remember that both the vertical and lateral planes will be affected the same way; without proper lateral stability, such a design would not have consistence, proper vertical alignment, and the pivot would tend to flop over to one side or another (usually in the direction of the weighted cartridge offset angle mounting) and stay in the position it happened to find itself. Obviously this condition must be avoided. In achieving Neutral Balance for vertical pivoting motion of the Phantom, a means was needed that would provide strong lateral stabilization, while not adversely affecting Neutral Balance in any way. The answer to this lies at the very heart of the Phantom's design and its unique ability to retrieve groove information unprecedented in our experience.

The key is a magnetic stabilization system which is the subject of patent applications, and which we have called "Magneglide" (TM).