

Pendragon

Loudspeaker System

Duelund discovered that each driver in a multi-way system must have identical phase shift, i.e. there must be no phase difference between the drivers, regardless of frequency.

That the relative phase difference between drivers is more important than overall system phase also makes intuitive sense in light of the fact that the human ear uses phase to determine the directionality of sound, unlike a laboratory microphone.

With a breakthrough, ideal real-world filter, the major task remained of finding the best available drivers and then modifying them heavily to ensure that filtered driver response followed the filter function. In Duelund's perfectionist hands, filtered driver behaviour had to be perfect across as broad a frequency range as possible, not just to the -6 or 10 dBpoint, but all the way down to -30 dB.

Once these extensive modifications were completed, a new universe of loudspeaker design opened up.

Duelund recognised the same attitude in Rasmussen's approach to electronics development and they collaborated on radical experiments with little commercial potential, but acquiring valuable knowledge in the process.

The true legacy of Steen Duelund, beyond his innovative crossover design, his mathematical papers and the drivers, capacitors, resistors and coils he constructed, lies in his unique approach to solving problems, his lateral thinking and his openness to new ideas.

It is this heritage that lives on in Gryphon loudspeakers.

Steen Duelund's passing was a great loss, but thanks to years of close collaboration on decades of Gryphon loudspeaker development and his comprehensive written documentation of his theories, there can be no doubt that Gryphon loudspeakers, from the Pendragon and on into the future will continue to be developed in his spirit.

Simplicity

There is no escaping the fact that no single drive unit is capable of properly reproducing the entire audible range from 20 Hz to 20 kHz. No diaphragm can move fast enough to reproduce 20 kHz overtones

and, at the same time, move enough air to reproduce 20 Hz at realistic levels.

For this reason, loudspeaker manufacturers devote considerable resources during product development to selecting specialised drivers for each frequency section and, more importantly, to designing a cross-over network to coerce them all to work together. To do so, the frequency spectrum is sliced up electronically and each piece is directed to the appropriate driver where things are hopefully reassembled acoustically. It is at this point that so much can go wrong.

Are the selected crossover components good enough to do their job without signal loss or distortion? Are the drivers sufficiently similar in tonal quality that they can create the illusion of a single coherent source of sound? Does the crossover properly compensate for the drivers' varying sensitivities so that the resulting sound is correctly balanced top to bottom? Have the crossover points between the drivers been properly tuned for undetectable, seamless transitions with no frequency dips or peaks? Is the cabinet designed to prevent resonances and deleterious interaction between the drivers? And don't get us started on phase relationships...

As proven time and again, Gryphon Audio Designs are masters of this arcane art, but it has always been one of our guiding principles that eliminating a problem altogether is far better than trying to solve it. First off, Gryphon Pendragon eliminates the cabinet altogether in the high frequency tower. In order to remove multiple crossover filter sections from the signal path, Pendragon employs a single full-range ribbon to handle all frequencies above 200 Hz. The single crossover section consists of the finest Duelund parts and solid silver components encased in a heavily damped aluminium block suspended freely behind the panels.

The reinforced, extremely rigid high-frequency tower houses a single planar magnetic thin-film ribbon transducer with line source characteristics, i.e., the ribbon generates a continuous, perfectly coupled, cylindrical wavefront across its entire frequency range for a uniquely coherent, wide and deep soundfield. ▶



► As a consequence of the unique wavefront form, Sound pressure level at a given distance drops off at half the rate (-3d B) of conventional speakers (-6 dB), for a more full-bodied, consistent, room-filling listening experience.

The system's innate extremely wide and even horizontal dispersion with virtually nil vertical dispersion creates a large, stable sweet spot with none of the floor and ceiling reflections that muddy the sound of conventional multi-way systems. Eliminating this major source of room interference allows Gryphon Pendragon to achieve new levels of room-independent clarity and resolution.

The ribbon is mounted in a frame made of three layers of heavy-

gauge, self-reinforced steel to ensure solid construction, free from any inherent resonance. A symmetrical magnet system consisting of a push-pull configuration of ceramic magnets fitted on both sides of the diaphragm provide linear drive of the polyester diaphragm whose moving mass is actually less than the air load.

Laminated with aluminium strips that act as a planar spiral voice coil, the ribbon's large radiating area moves only a very small distance even at high volume with minimal distortion and perfect control. Due to the ribbon's open construction and large surface area, heat dissipation is not an issue, resulting in high power handling capabilities with consummate ease.

With ideal sound reproduction and mechanical behaviour across more than seven octaves, the Gryphon Pendragon high frequency tower eliminates crossover components in the critical mid frequency range, preserving spectral and temporal integrity.

The Pendragon high frequency tower presents a purely resistive load, significantly reducing demands on the partnering amplifier, although the system's unrivalled transparency and accuracy deserve to be mated with the finest amplification and source components.

As a result of the ribbon's ultra-low mass, high power handling, wide bandwidth and durability, the Gryphon Pendragon high frequency tower responds precisely and instantaneously to even the subtlest of micro-dynamic changes, conveying all the expressiveness, richness and complex textures of the greatest recordings, laid out across a vast, natural soundstage with pinpoint stereo imaging.

The Foundation

Deep bass is, perhaps counter-intuitively, the most difficult part of the audio spectrum to reproduce with both accuracy and seamless integration with the upper frequency range. A full-range speaker with bass drivers built into the main enclosure has its own set of demons to exor-

“Everything should be made as simple as possible, but not simpler.”
Albert Einstein

cise as does the currently popular approach of tacking on a separate subwoofer for bottom end duties.

The Gryphon Pendragon bass tower represents yet another elegantly simple

Gryphon solution to a number of complicated problems. Each Pendragon bass tower houses eight custom designed 8" drive units and a built-in, specially designed Gryphon Class A/B power amplifier capable of 1,000 Watts continuous output. For extended headroom, peak power is approximately 4,000 Watts or 4.5 horsepower.

The Pendragon amplifiers are everything you would expect from Gryphon with 18 high current bipolar output transistors, 200,000 microfarad capacitor bank, DC servo-coupling, zero global negative feedback, no output relays, output coupling via massive copper bussbars, decoupled transformer casings, military spec. double-sided printed circuit boards and Holmgren toroidal transformers with internal magnetic shielding.

Active bass allows the user to select a separate amplifier for the high frequency towers without having to worry about the power demands of the massive Pendragon bass system. The bass system crosses over to the mid/high tower at 200 Hz.

By physically separating the bass and upper frequency sections, Gryphon Pendragon elegantly sidesteps the issues that inevitably arise in a full-range cabinet or in a satellite/subwoofer configuration.

Conventional passive loudspeakers must be designed for compatibility with a wide range of commercially available power amplifiers and active subwoofers are typically driven by an off-the-shelf "digital" power module that could fit in your hand.

By way of comparison, the purpose-built, onboard Pendragon power amplifier weighs in at 70 kg per tower!

Unlike compromised, "univer-



sal” amplifiers, the Pendragon amp has been conceived and built exclusively for optimal integration with the selected drive units, cabinet and flexible array of user-adjustable room integration parameters, for a level of performance unachievable by any standard mix-and-match approach.

Naturally, ideal integration with the Pendragon high frequency tower is assured.

Significant effort and resources have been focused on delivering extended deep bass with articulation, force and authority, completely independent of the acoustic environment.

To achieve this ambitious goal, the amplifier incorporates sophisticated Q Control circuitry to fine-tune bass response as well as additional features to ensure ideal room interface. The bass remote control allows adjustment of bass level, Q, low cut and other parameters directly from the listening position.

The bass module offers Standby mode and provides effective driver protection via a comprehensive non-invasive system that monitors all functions more than 100 times per second.

The singular bass performance of the Gryphon Pendragon system heightens awareness of rhythmic subtleties and nuances as it immerses the listener in music’s rhythmic power.

Unapologetic Luxury

In a period of global financial crisis with no apparent end in sight, it cannot have escaped the attention of even the most casual observer that the audio industry and High End audio in particular have been in a state of constant and unpredictable flux as long-established brands struggle to re-invent themselves for survival under a brave new world order.

Some high profile brands soldier on, dazed and confused, with

significantly downsized ambitions. Some have surrendered, lending their name recognition to a range of iProduct accessories. Others have quietly closed up shop and faded away.

Gryphon Audio Designs of Denmark, however, have gambled and won with a bolder, more ambitious approach. Perhaps invigorated by our recent 25th anniversary celebrations, Gryphon reaffirms our commitment to being the best that we can be with the Gryphon Pendragon reference loudspeaker system.

The Pendragon towers are our proudest statement, our declaration of love to music and a finely crafted sculptural element to grace even the most luxurious of surroundings.

