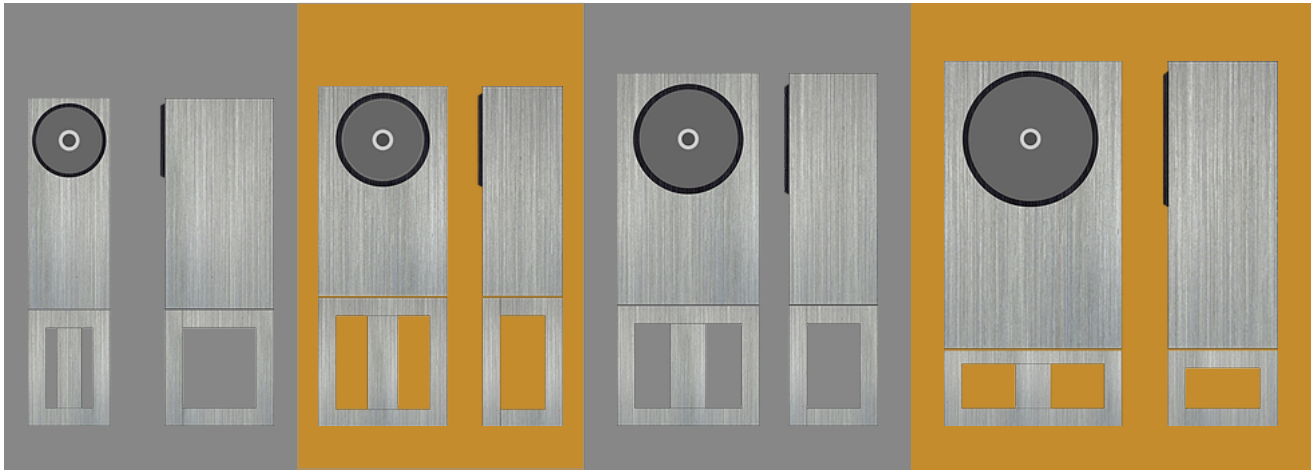


ABOUT THE DESIGN



GRA 8 sLIM
8" Concentric Driver
95 dB

"LE DAUPIN"

The Crown Prince
The heir to the Crown

Originally the title attached to "the Dauphin of Viennois," whose province (in the French Alps north of Provence) came to be known as Dauphiné. Three dolphins were on the coat of arms of the lords of Viennois, first worn by Guido IV.

Dimensions & Weight
9.25W x 12.25D x 23.63H in
Height with stand 36.8 in
Stand height 13 in
29 lbs ea

GRA 10
10" Concentric Driver
94 dB

"LE CLARION"

From Le Clarion des Anges, or the Trumpet of the Angels
Clarion means loud and clear, and a clarion call is a call to something that is hard to ignore.

Dimensions & Weight
14.5W x 9D x 23.5H in
Height with stand 38.2 in
Stand height 14.5 in
28 lbs ea

GRA 12
12" Concentric Driver
96 dB

"SYLPHYDE"

A Sylph (also known as Sylphid) is an air spirit. They are formed of air, they live in the air, and they have unusual power over the air, particularly the wind and the clouds. Usually, Sylphs are portrayed as guardians who protect secret knowledge, beautiful women, or the environment, but it's not out of the question for a Sylph to cause mischief among men.

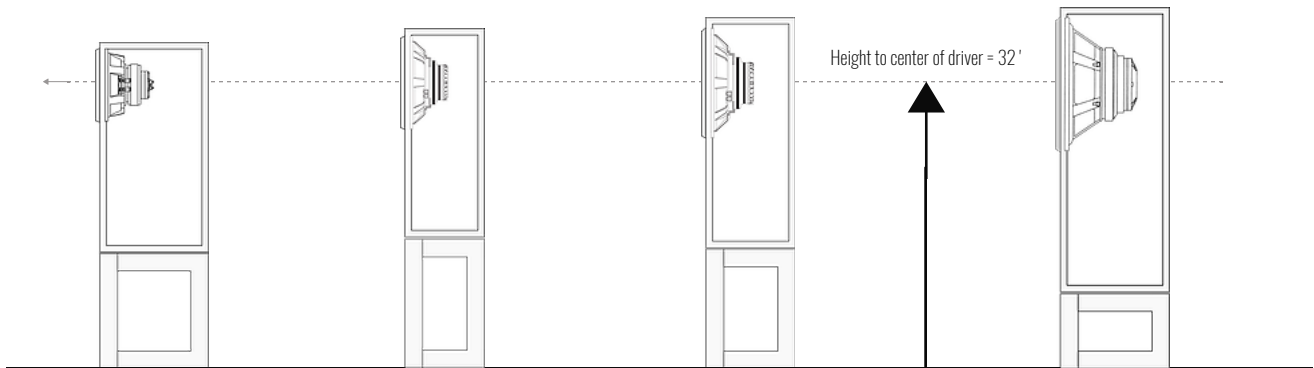
Dimensions & Weight
16W x 10D x 26H in
Height with stand 39.6 in
Stand height 13.5 in
35 lbs ea

GRA REFERENCE 15
15" Concentric Driver
102 dB

"HYPNOSE"

From greek hypnos
A trance-like state of mind
The induction of a state of consciousness in which a person is highly responsive to suggestion or direction

Dimensions & Weight
20W x 12.4D x 32.3H in
Height with stand 41 in
Stand height 8.5 in
45 lbs ea



Why Radian ? About Radian Drivers

The answer is simple. We opted for the use of Radian drivers because of three attributes that ideally should be present in a driver for optimal speaker design, and that the engineers at Radian have managed to incorporate in all their models -- High Performance, High Quality of build and materials, and High Dependability.

The measurements and listening tests we preformed, and this in the context of developing a series of Audiophile Quality High Sensitivity loudspeakers, found the Radian line of co axial drivers to have truly superior performance across the audio spectrum. We were also able to confirm that, indeed, Radian uses the highest grade of Ferrite and Neodymium needed for the design of our Standard and Reference models.

Our friend Noam Bronstein of the Wall of Sound contributed these words about Radians :

For those who aren't familiar with this manufacturer, Radian makes many drivers, primarily for the pro audio market. Their range of "dual-concentrics" includes 8", 10", 12" and 15" models, and these are all upgradeable with Beryllium diaphragm tweeters and Neodymium-magnet woofers (the basic stock 5215b is a \$600 driver. For the 5215BeNeo? Don't ask).

And of course, the large dual-concentric design is of great interest to a healthy number of audiophiles, i.e. all those folks using vintage drivers from Tannoy, Altec-Lansing, JBL, and numerous others. Now obviously, pro drivers and domestic drivers are in some ways like apples and oranges – they belong to the family we call "fruit", they share a shape and size, but their uses and characteristics tend to diverge like the proverbial fork in the road.

Domestic audiophile speakers tend to be "scaled" for use in an average sized room, with an average sized amp, at moderate listening levels, the focus being on refinement, and so on. Pro drivers like the Radians can typically be more edgy, capable of very high SPL's (therefore high sensitivity), and, above everything else in their design brief, they also need to be dead reliable.

What does all that mean? It means that Radian have traditionally supplied these drivers to the pro market with crossovers designed first and foremost to protect the voice coils. Big, high power ceramic L-pad resistors, lots of filtering and inductance. It's the audiophile's equivalent of throwing a big blanket over your speakers – adding phase errors and any other type of colouration you care to name. But it allows Radian Audio's people to sleep at night and still warranty their drivers against 500 Watts RMS. Max SPL of 130dB for these Dual-concentrics, you say? Yep, and that means you're more likely to fry your Bryston 4B than burn up a Radian voice coil.

Essentially, the Radians are akin to Formula 1 race cars – that are designed to perform at extremely high levels, in a wide variety of sound reproduction situations, and to be able to do so under difficult conditions. But, like Formula 1 race cars, they require extensive attention to "tuning", if one wants to adapt their qualities to the environment in which audiophile quality sound is experienced. People "in the know" (like Frank Fazzalari) recognized that the Radian drivers could be capable of superb fidelity, with the right approach. The "tuning" effort -- and the quality of the associated components required to "tame the Radian Beasts" -- however, comes at a high cost. There are other High End manufacturers, particularly in Europe, who also have recognized the potential of these drivers and who use Radian's in their speakers, but in Frank's case, he aimed to market a line of audiophile loudspeakers that was accessibly priced, and which are significantly less expensive than those being offered by his competitors.

What's with all these metals ? -- Ferrite, Neodymium, Aluminum, Beryllium ?

Ferrite and Neodymium are metals used in driver magnetics, whereas Aluminum and Beryllium are typically encountered in tweeter driver diaphragms. Aluminum is also encountered in alloy form combined with Nickel and Cobalt, and is known as AlNiCo ...used in the construction of driver magnets.

The following is a brief summary of each metal's usage and the design's specific key characteristics.

Ferrite / aka Ferrous Ceramic

This is the most common magnet type used in speaker design. And there are multiple quality levels of Ferrite magnets used for drivers.

We use only the highest grade ferrite magnets in our systems, with separate magnets used for the woofer and compression drivers. The highest grade Ferrite magnets produced today equal, and in many cases, surpass the qualities of once "iconic" AlNiCo magnets, and avoid some of the "relative" downsides of their use -- compression at high SPL / volume.

Neodymium

After Alnico (not used in Coherent speakers) this is the next most expensive type of magnet available today. It's higher magnetic energy allows for faster transients and a more dynamic output. Speakers using this type of magnet all exhibit very high sensitivity ratings ... typically in excess of 98dB.

The highest grade of Neodymium is used in all NEO Reference 15 models. Here again we also use separate magnets for woofer and compression drivers. In the case of our Reference 15 speaker (15" driver assembly), the Sensitivity specification is an extremely high 102dB allowing for the use of very low power output tube amplifiers such as ones based on the Type 45 tube (1.7W).

Aluminium

The most common alloy used in tweeter domes today.

However, the proprietary alloy used in our systems at Coherent is processed by Radian to outperform all aluminium domes on the market.

Furthermore, all of our domes have a Mylar surround which helps to control unwanted resonances making for a non-fatiguing presentation.

Beryllium

A very high quality and high cost alloy used in tweeter domes, and in our BE models. It exhibits high stiffness, light weight and smaller breakup nodes which allow for particularly pristine mids and highs.

About Radian & Power. What's with the power rating ?

.. or .. Why 2 Watts are possible , but 200Watt amps and above will also be useable ...depending on the situation

Due to high sensitivity of the Coherent line it is possible to use Single Ended Triode tube based amplifiers. These are normally in the 1.5 to 25 watt range so 94 to 100db is highly recommended. The list of tubes is very extensive, and apart from the most popular audiophile tubes in this group - Type45, 2A3, PX25, and the 300B - many more tubes are excellent candidates such as the Type71, 4P1L, 6C19P, 211, 845, 6C33C, Gu-50, GM70 and triode-strapped EL34, KT88 and KT120s.

The high power handling in excess of 200 watts and as high as 600 watts on the higher end models allow for the use of much higher power amps without worry of causing damage. But, on another positive note, the high sensitivity means even high power amps will only be asked to deliver under 2 to 3 watts at normal levels which allow the Class A/B amp to run in Class "A" mode.

About X-Over design - Coherent's Approach & Philosophy

The Coherent "XD crossover" is exclusive to our line. This unique system uses no resistors to pad down the compression driver to match the woofer section output.

The woofer has one inductor in the signal path, and the compression driver has one capacitor and optional bypass caps on it.

"Impedance Matching" is then used to make the two drivers act as one in the critical midrange 800hz to 2500hz frequency range.

In our opinion less is better .. some high end x-over designs have as many as 25 elements in their designs.

Early on, Frank noticed that each combination of capacitors and coils "ring" at a given frequency, and this phenomenon reflects radio filter theory. The more combinations, the more ringing .. and this makes its way through to the ear. Our XD x-over thus greatly reduces this ringing, and helps to produce clean and smooth mids and highs.



Why is the choice and quality of components so important for high efficiency speaker topology design ?

Essentially, high sensitivity speakers are what they were designed to be ... SENSITIVE. So, they respond to, and expose the characteristics of, whatever is upstream from them, and this much more so than less sensitive speakers. To get them to deliver their superb qualities, and those of the high quality tube amplifiers typically used to drive them -- microdynamics, speed, fine tonal texture and layering, correct timing and decay -- great care needs to be applied in designing both the X-over and the cabinet, and in selecting associated components including capacitors, coils and internal cabling.



The Golden Ratio ? Magic dust, or aesthetic imperative ?

To be perfectly clear, the Golden Ratio design approach is an aesthetic choice, and does not have any influence on sound. So what is this ratio, and why did we use it ?

Mathematically speaking, two quantities are in the Golden Ratio if their ratio is the same as the ratio of their sum to the larger of the two quantities.

This relationship between the various dimensions was discovered to be 1.618, a mathematically irrational number which, interestingly, became referred to as the golden ratio, golden mean, divine proportion and many other names that golden ratio is associated with.

What is more interesting than the value is the discovery of the value.

Centuries ago, genius minds started observing patterns in the beautiful nature that surrounded them -- From the leaf arrangement in plants, to the pattern of the florets of a flower, the bracts of a pinecone, or the scales of a pineapple -- everything had the same pattern. And the arrangement goes 1, 2, 3, 5, 8, 13, 21, 34 and so on. Voila! The Fibonacci. When you start calculating the ratio of fibonacci number with its previous fibonacci number, we end up with something like 1.61803... an irrational number, rounded up to 3 decimal places 1.618, which is the golden ratio we read about.

Because this was naturally pleasing to the eyes, this number was then used in creating proportions for architecture, paintings, sculptures, photography, design etc. ... and in our case, speaker cabinet proportions. To illustrate how pleasing this is, we show below a drawing of what this would look like if using lines and shapes typically associated with loudspeakers :

