

# 50 neutral and extra-bass over-ear headphones

Presentation only © Dale Cotton, 2021. All rights reserved. Version 2.2.  
Data and photos copyrights belong to original sources. You may re-circulate this document. You may not claim authorship or copyright to it.

A

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

[Explanatory notes](#)

[Open](#) = open-back | [Closed](#) = closed-back

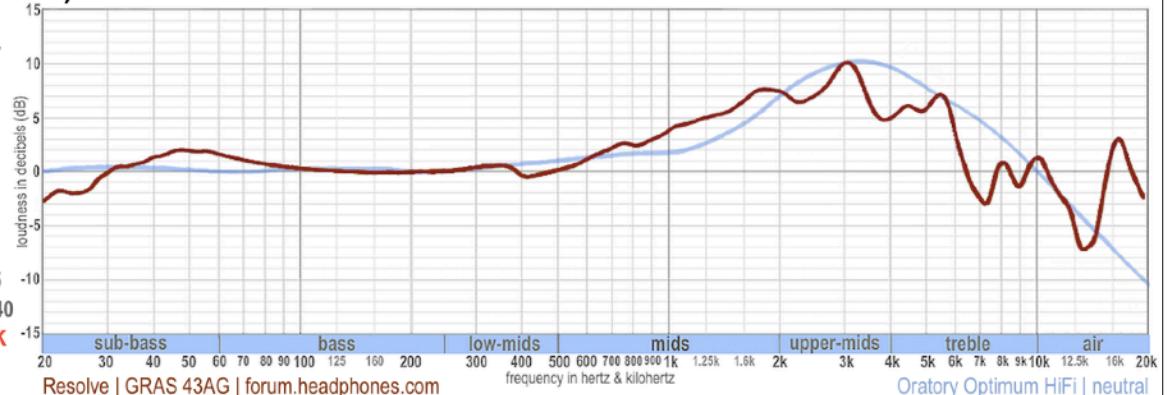
[Sen](#)=sensitivity (V) | [Imp](#)=impedance | [Wgt](#)=weight (G) | [Pri](#)=price  
[orange](#) or [red](#) = notice this, ≠ inappropriate values

## Abyss Diana Phi (DMS mod)



[Open](#)  
[Planar](#)

[Sen: 91](#)  
[Imp: 35](#)  
[Wgt: 240](#)  
[Pri: \\$4K](#)



[Resolve](#) | [GRAS 43AG](#) | [forum.headphones.com](#)

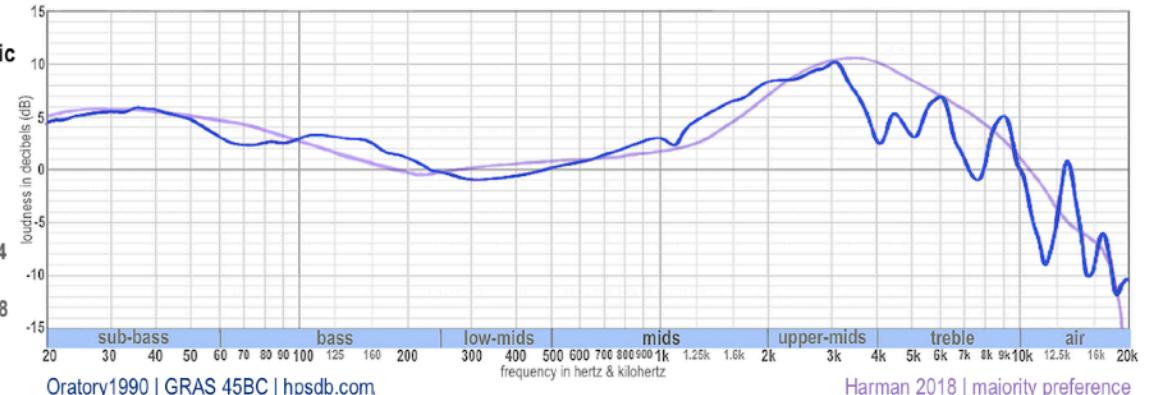
Oratory Optimum HiFi | neutral

## AKG K361



[Closed](#)  
[Dynamic](#)

[Sen: 114](#)  
[Imp: 32](#)  
[Wgt: 218](#)  
[Pri: \\$85](#)



[Oratory1990](#) | [GRAS 45BC](#) | [hpsdb.com](#)

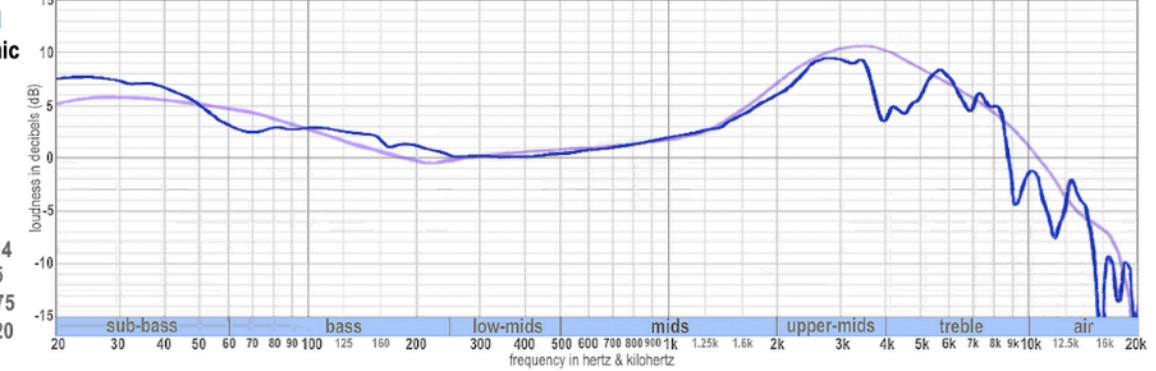
Harman 1990 | majority preference

## AKG K371



[Closed](#)  
[Dynamic](#)

[Sen: 114](#)  
[Imp: 35](#)  
[Wgt: 275](#)  
[Pri: \\$120](#)



[Oratory1990](#) | [GRAS 45BC](#) | [hpsdb.com/oratory/headphones](#)

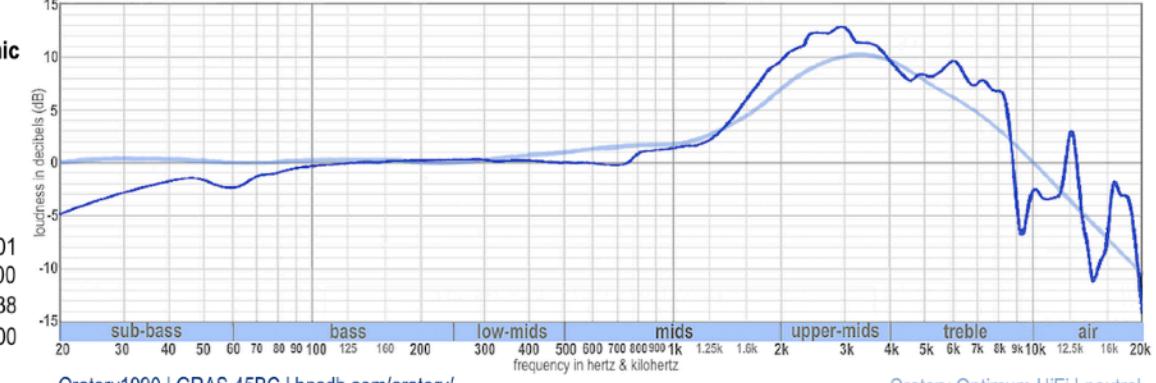
Harman 1990 | majority preference

## AKG K612



[Open](#)  
[Dynamic](#)

[Sen: 101](#)  
[Imp: 200](#)  
[Wgt: 238](#)  
[Pri: \\$200](#)



[Oratory1990](#) | [GRAS 45BC](#) | [hpsdb.com/oratory](#)

Oratory Optimum HiFi | neutral

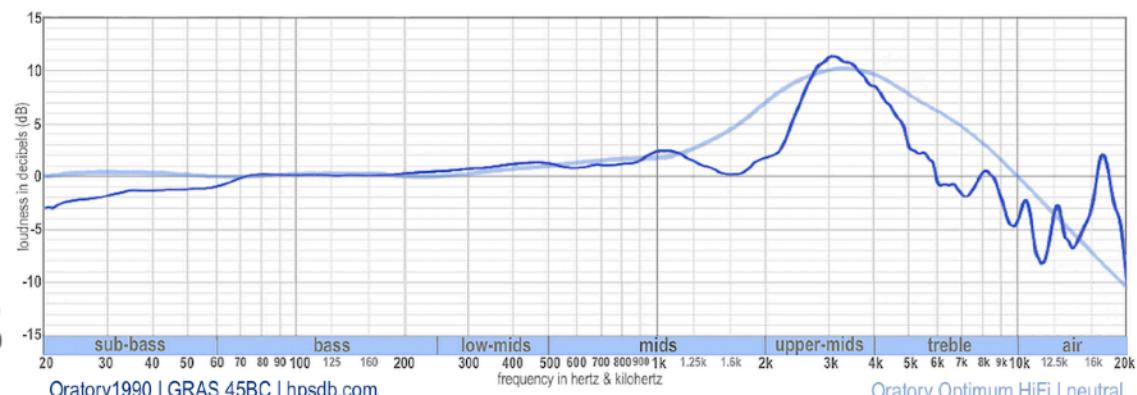
# 50 neutral and extra-bass over-ear headphones

## Audeze LCD-1



**Open  
Planar**

Sen: 117  
Imp: 16  
Wgt: 260  
Pri: \$300



Oratory1990 | GRAS 45BC | hpsdb.com

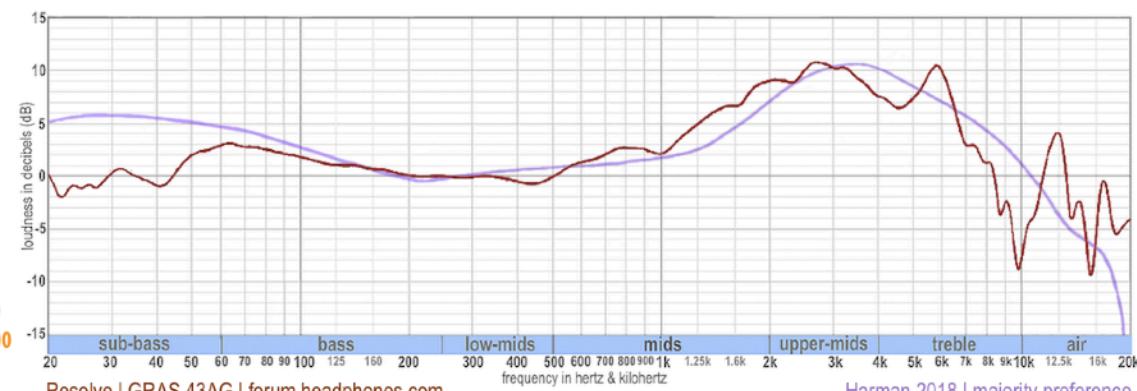
Oratory Optimum HiFi | neutral

## Audeze LCD-XC



**Closed  
Planar**

Sen: 117  
Imp: 20  
Wgt: 720  
Pri: \$1300



Resolve | GRAS 43AG | forum.headphones.com

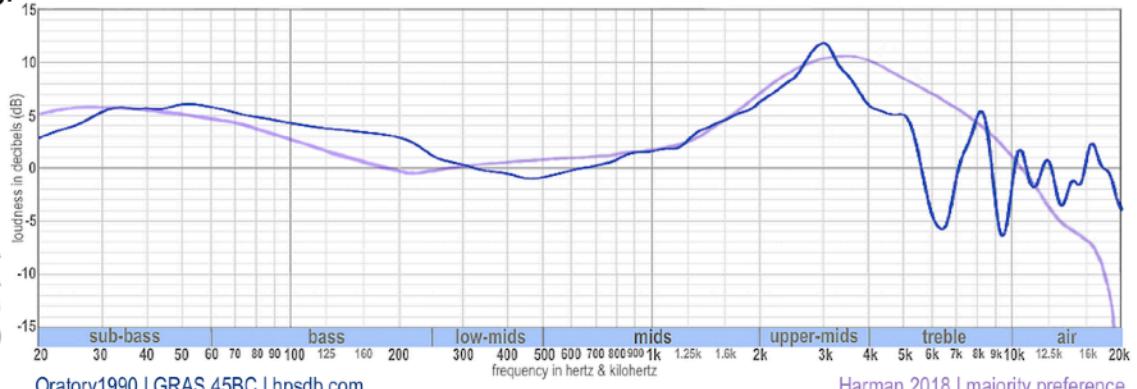
Harman 2018 | majority preference

## Audeze Mobius (gaming)



**Closed  
Planar**

Sen: N/A  
Imp: N/A  
Wgt: 350  
Pri: \$250



Oratory1990 | GRAS 45BC | hpsdb.com

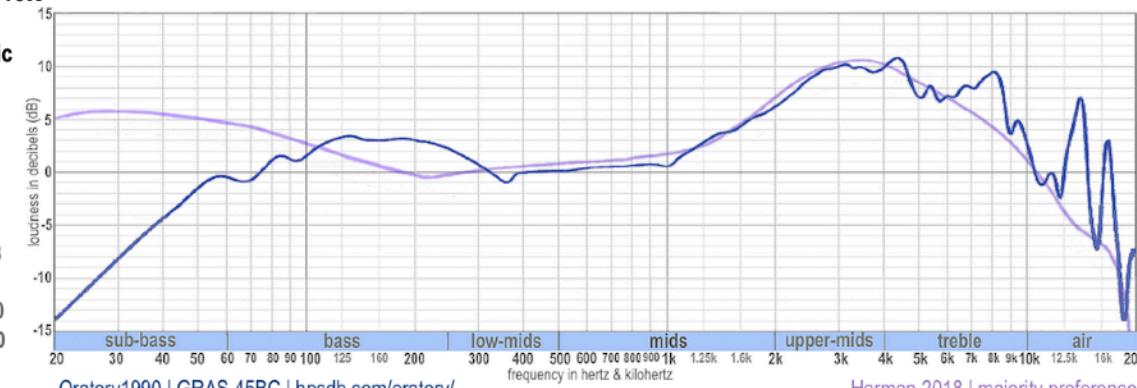
Harman 2018 | majority preference

## Audio-Technica ATH-M40x



**Closed  
Dynamic**

Sen: 113  
Imp: 35  
Wgt: 240  
Pri: \$100



Oratory1990 | GRAS 45BC | hpsdb.com/oratory/

Harman 2018 | majority preference

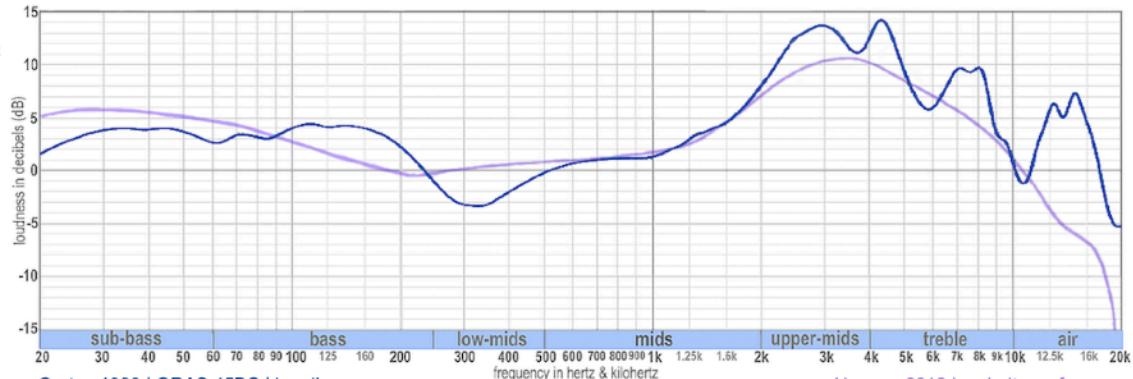
# 50 neutral and extra-bass over-ear headphones

## Audio-Technica ATH-M50x



**Closed**  
**Dynamic**

Sen: 113  
Imp: 38  
Wgt: 285  
Pri: \$150



Oratory1990 | GRAS 45BC | [hpsdb.com](https://hpsdb.com/).

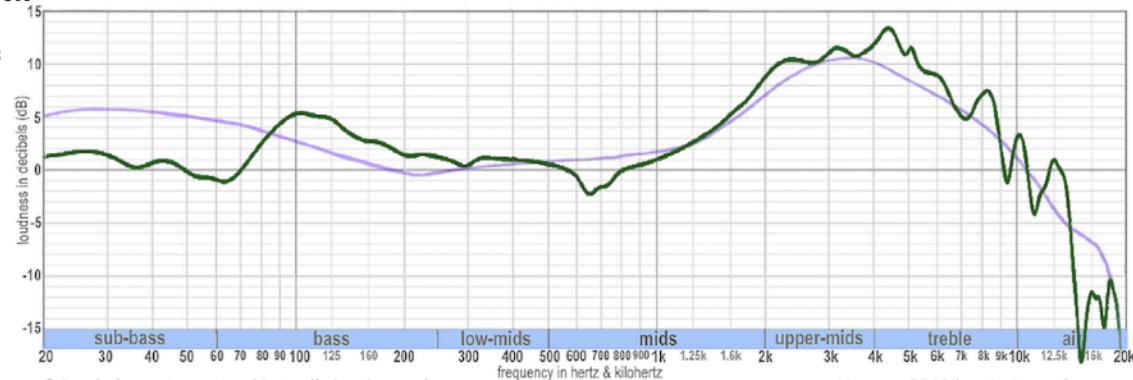
Harman 2018 | majority preference

## Audio-Technica ATH-M70x



**Closed**  
**Dynamic**

Sen: 112  
Imp: 35  
Wgt: 280  
Pri: \$350



Crinacle | GRAS 43AG-7 | <https://crinacle.com/>

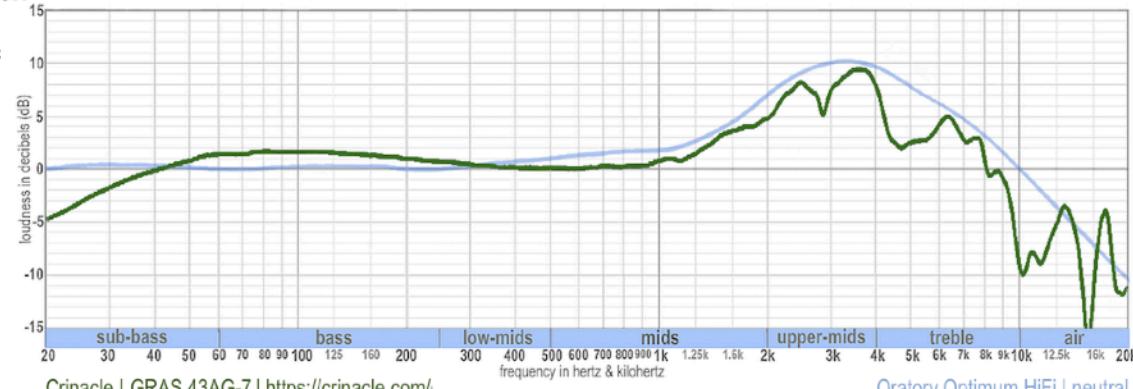
Harman 2018 | majority preference

## Audio-Technica ATH-R70x



**Open**  
**Dynamic**

Sen: 99  
Imp: 470  
Wgt: 210  
Pri: \$350



Crinacle | GRAS 43AG-7 | <https://crinacle.com/>

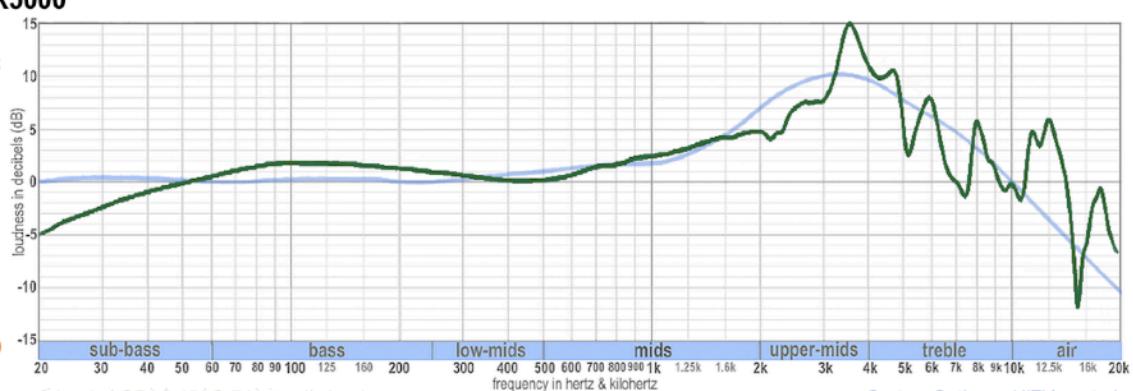
Oratory Optimum HiFi | neutral

## Audio-Technica ATH-ADX5000



**Open**  
**Dynamic**

Sen: 104  
Imp: 420  
Wgt: 270  
Pri: \$2250



Crinacle | GRAS 45AG-7 | <https://crinacle.com>

Oratory Optimum HiFi | neutral

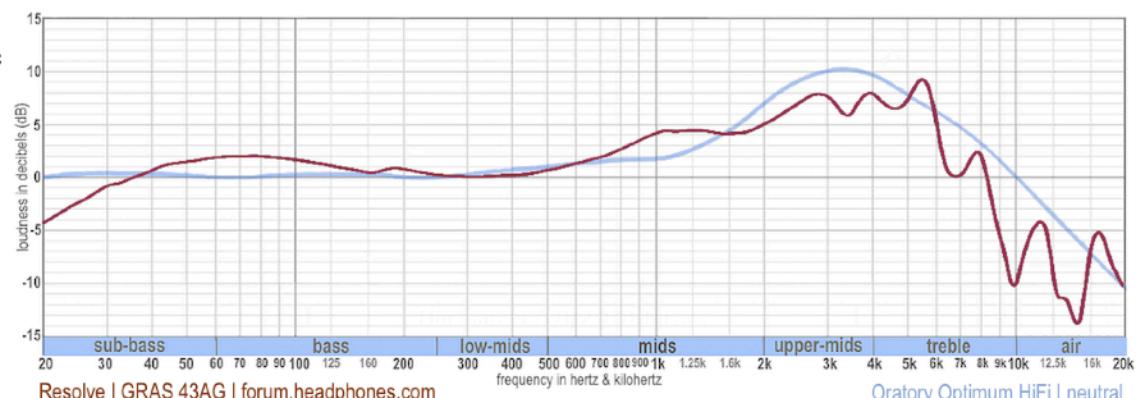
# 50 neutral and extra-bass over-ear headphones

## Auroris Audio Borealis



**Open Dynamic**

Sen: 114  
Imp: 32  
**Wgt: 484**  
Pri: \$899



Oratory Optimum HiFi | neutral

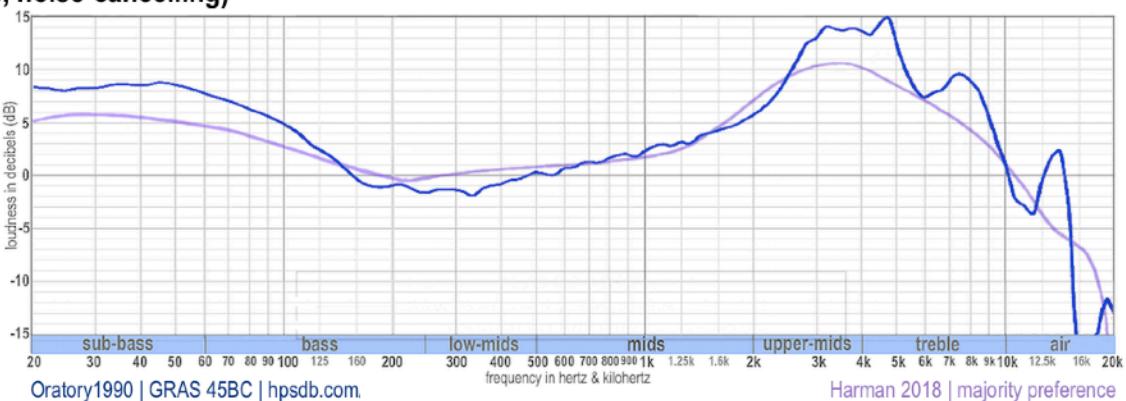
B

## Beats Solo Pro (wireless, noise-cancelling)



**Closed Dynamic**

Sen: N/A  
Imp: N/A  
Wgt: 262  
Pri: \$199

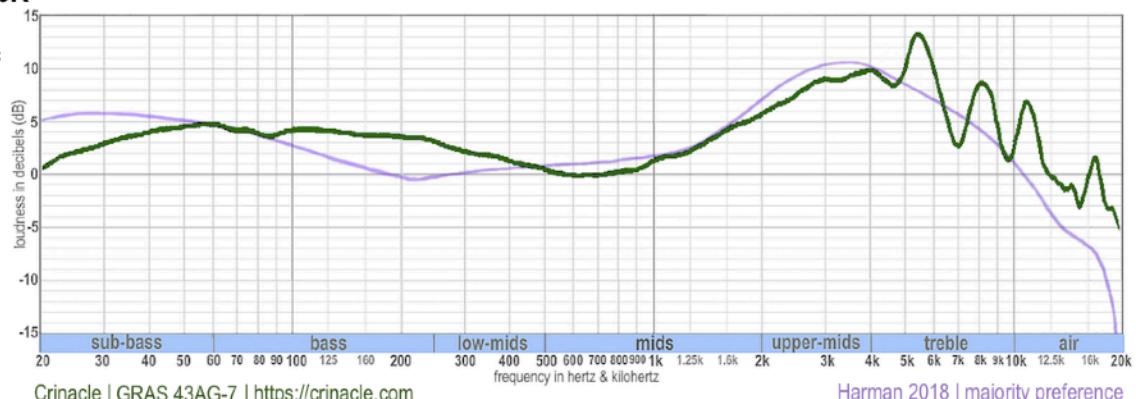


## beyerdynamic TYGR 300R



**Closed Dynamic**

Sen: 111  
Imp: 32  
Wgt: 290  
Pri: \$180



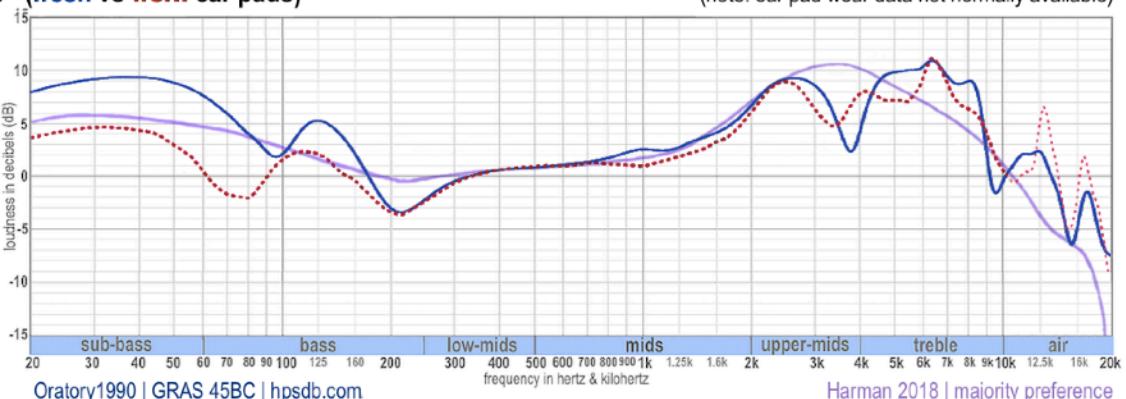
## beyerdynamic DT770 Pro (fresh vs worn ear pads)

(note: ear pad wear data not normally available)



**Closed Dynamic**

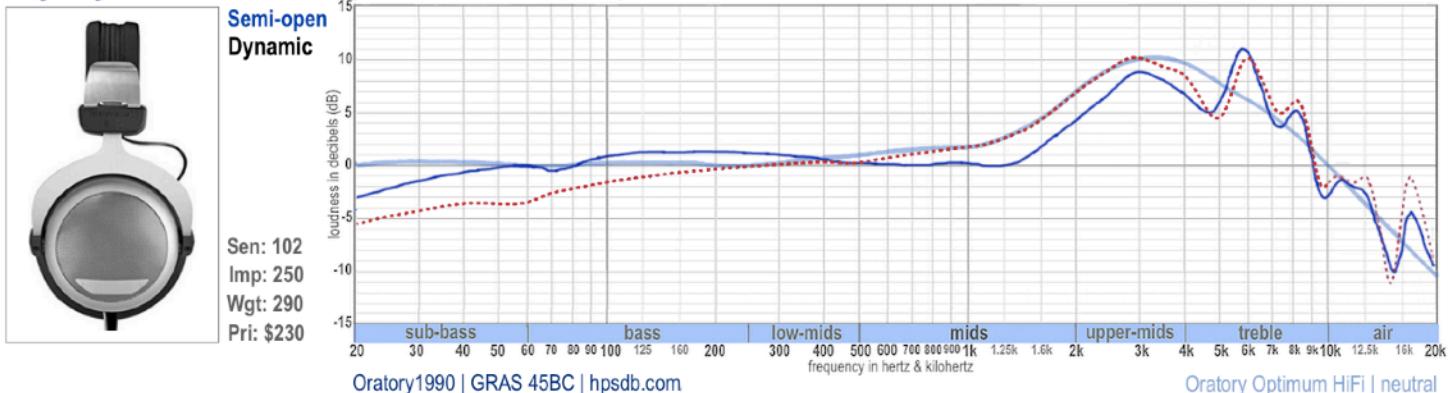
Sen: 102  
Imp: 250  
Wgt: 270  
Pri: \$160



# 50 neutral and extra-bass over-ear headphones

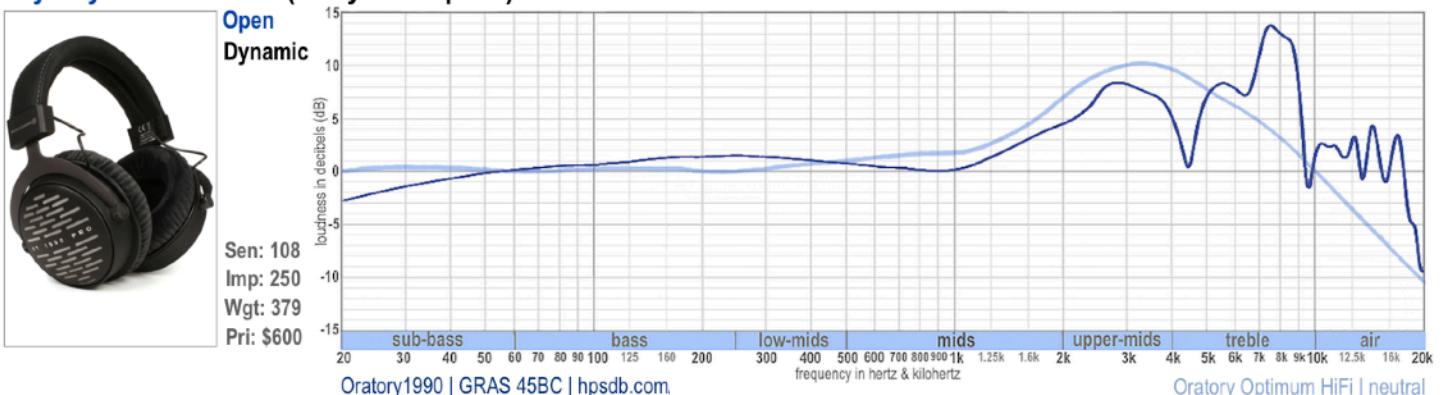
## beyerdynamic DT 880 Pro (fresh vs worn ear pads)

(note: ear pad wear data not normally available)



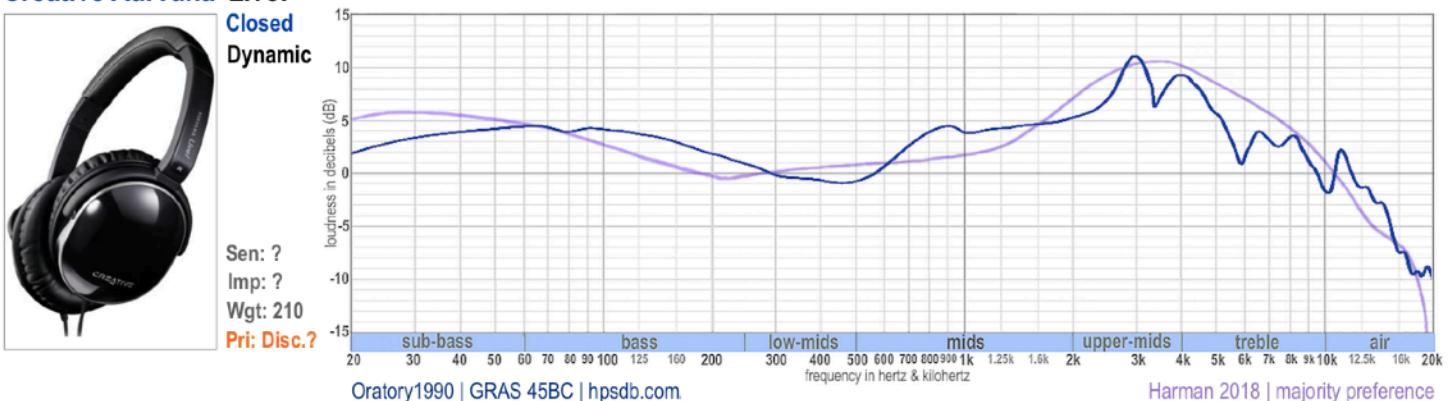
## beyerdynamic DT1990 (analytic ear pads)

Open Dynamic



## Creative Aurvana Live!

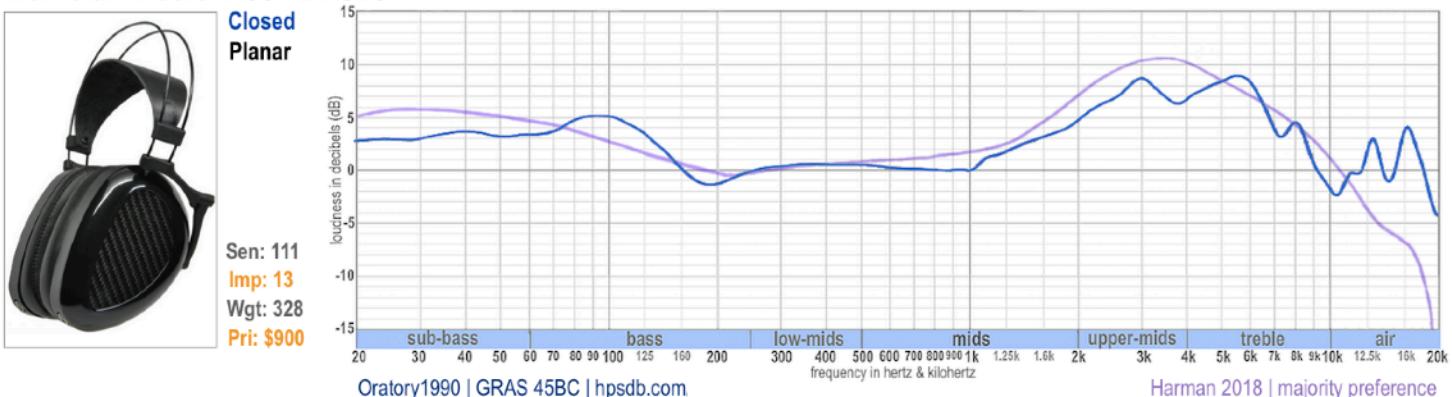
Closed Dynamic



C

## Dan Clark Audio Aeon 2 Noire

Closed Planar



D

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#)

Page 5

[N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

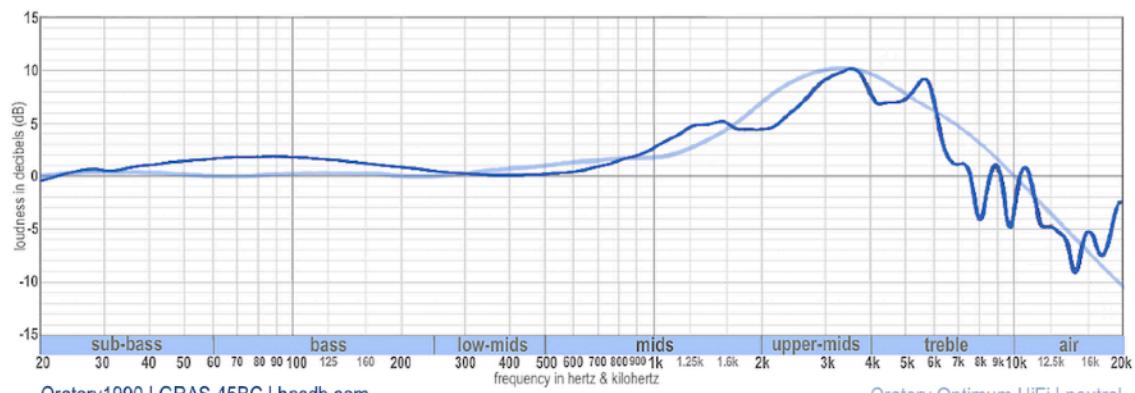
# 50 neutral and extra-bass over-ear headphones

## Drop+Focal Elex



**Open  
Planar**

**Sen: 115  
Imp: 80  
Wgt: 450  
Pri: \$700**



Oratory1990 | GRAS 45BC | hpsdb.com

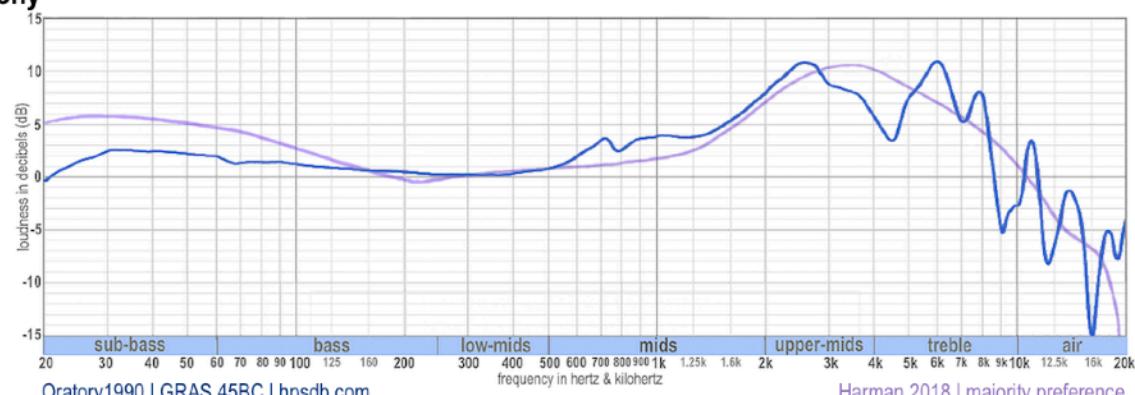
Oratory Optimum HiFi | neutral

## Drop+Fostex TR-X00 Ebony



**Closed  
Dynamic**

**Sen: 111  
Imp: 25  
Wgt: 450  
Pri: discl.**



Oratory1990 | GRAS 45BC | hpsdb.com

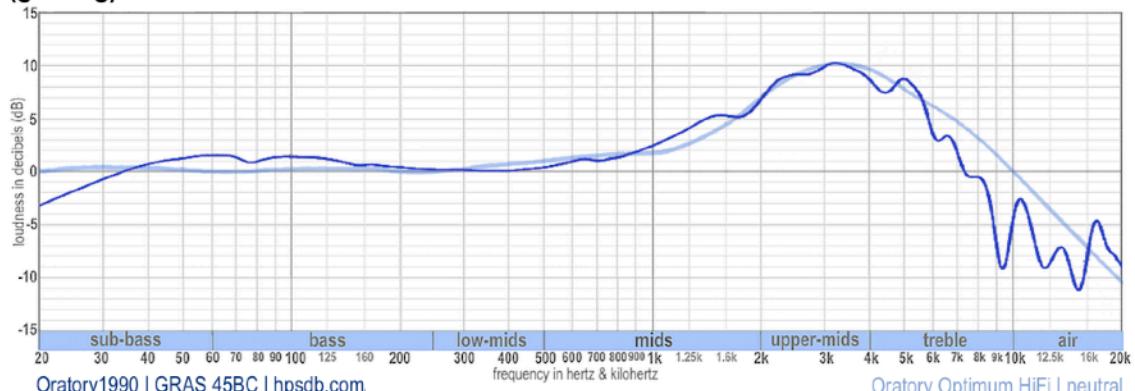
Harman 2018 | majority preference

## Drop+Sennheiser PX38X (gaming)



**Open  
Dynamic**

**Sen: 109  
Imp: 28  
Wgt: 253  
Pri: \$169**



Oratory1990 | GRAS 45BC | hpsdb.com

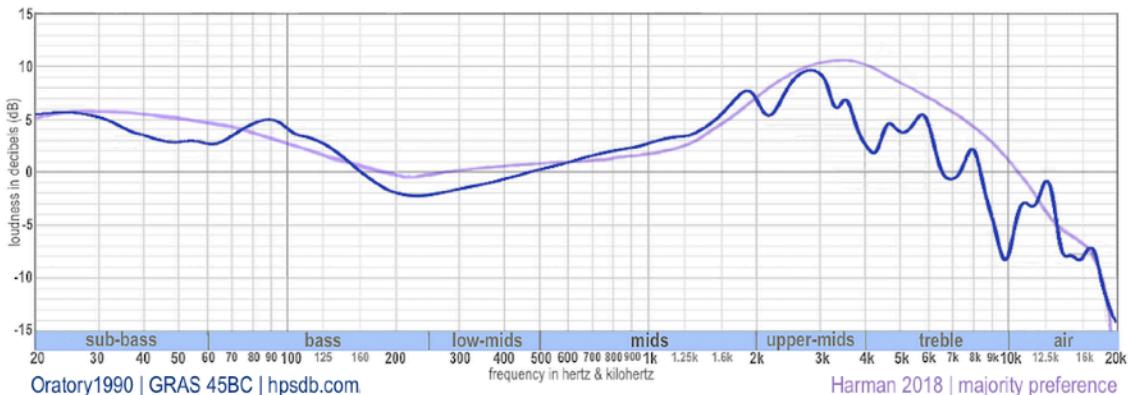
Oratory Optimum HiFi | neutral

## Focal Celestee



**Open  
Dynamic**

**Sen: 120  
Imp: 35  
Wgt: 430  
Pri: \$990**



Oratory1990 | GRAS 45BC | hpsdb.com

Harman 2018 | majority preference

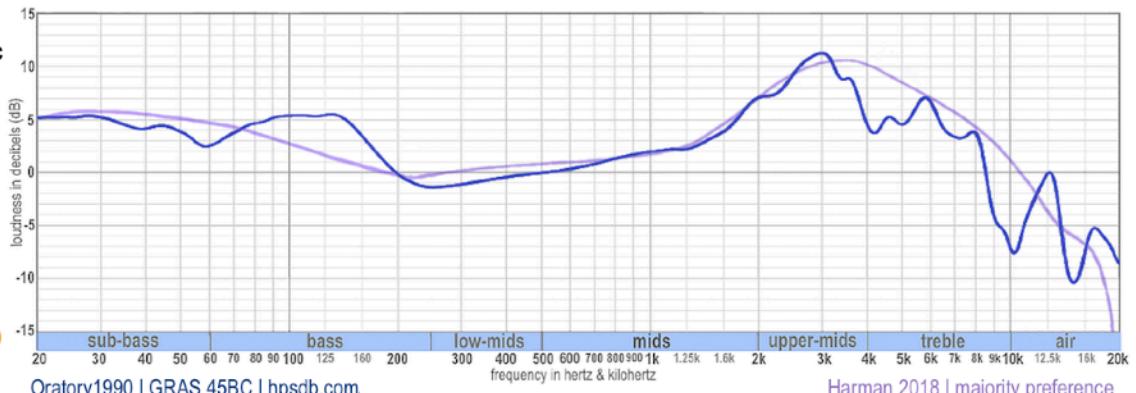
# 50 neutral and extra-bass over-ear headphones

## Focal Radiance



**Open  
Dynamic**

Sen: 115  
Imp: 35  
Wgt: 435  
Pri: \$1290



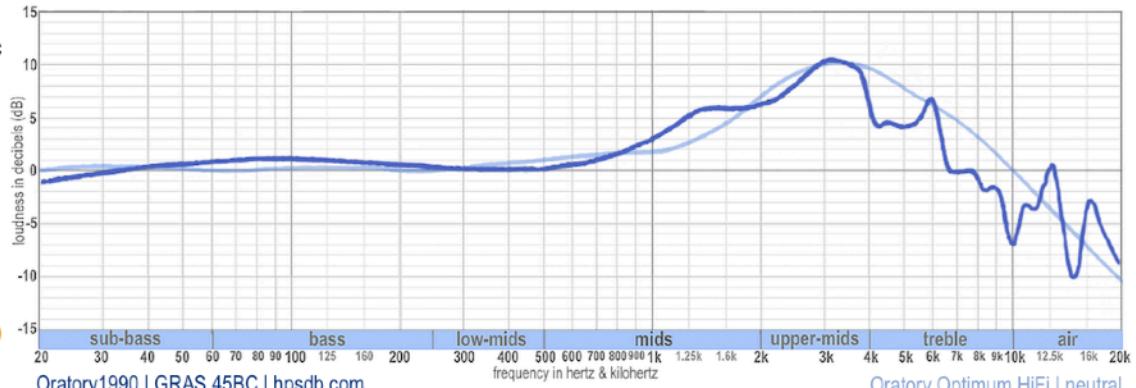
Oratory1990 | GRAS 45BC | hpsdb.com | Harman 2018 | majority preference

## Focal Clear



**Open  
Dynamic**

Sen: 116  
Imp: 55  
Wgt: 450  
Pri: \$1490



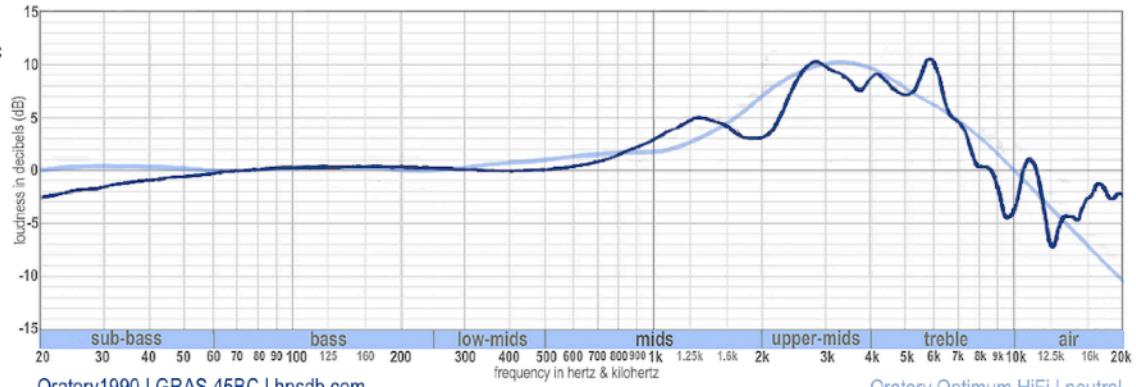
Oratory1990 | GRAS 45BC | hpsdb.com | Oratory Optimum HiFi | neutral

## Focal Utopia



**Open  
Dynamic**

Sen: 109  
Imp: 80  
Wgt: 490  
Pri: \$3330



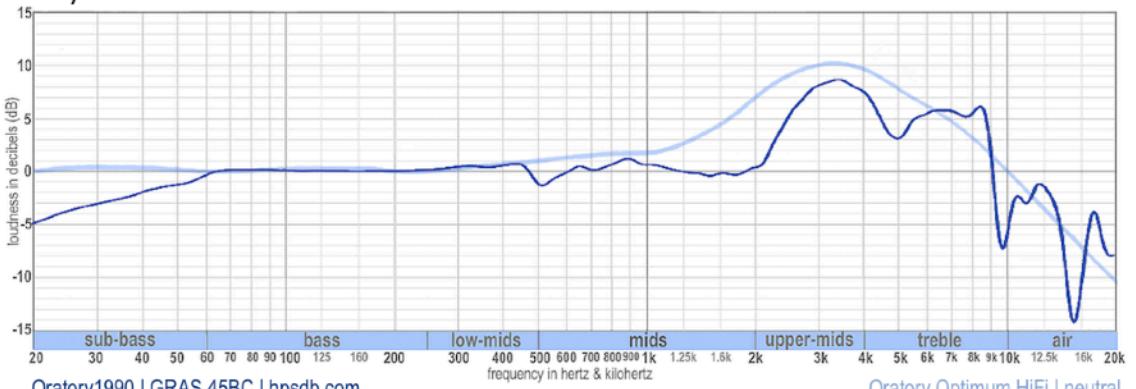
Oratory1990 | GRAS 45BC | hpsdb.com | Oratory Optimum HiFi | neutral

## Hifiman HE400i (2020 revision)



**Open  
Planar**

Sen: 107  
Imp: 35  
Wgt: 370  
Pri: \$200



Oratory1990 | GRAS 45BC | hpsdb.com | Oratory Optimum HiFi | neutral

**H**

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#)

Page 7

[N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

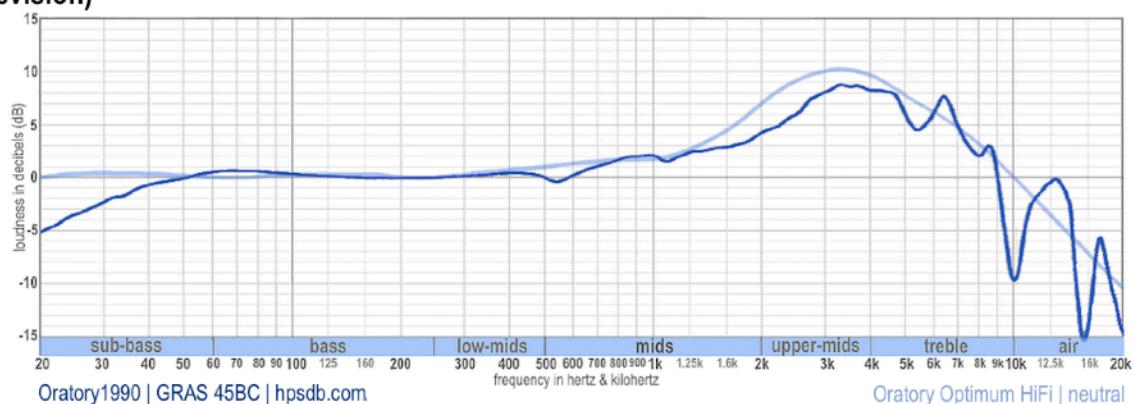
# 50 neutral and extra-bass over-ear headphones

## Hifiman Sundara (2020 revision)



**Open  
Planar**

Sen: 108  
Imp: 37  
Wgt: 372  
Pri: \$350

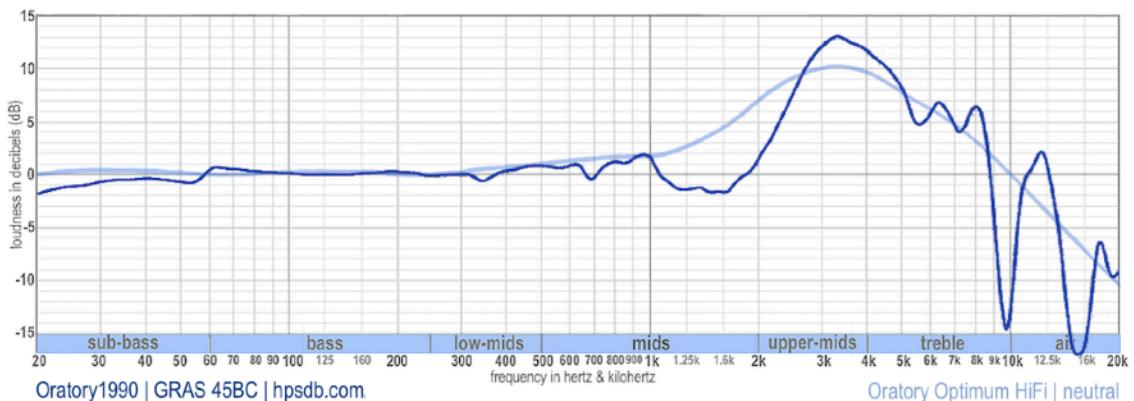


## Hifiman Ananda



**Open  
Planar**

Sen: 103  
Imp: 25  
Wgt: 399  
Pri: \$850

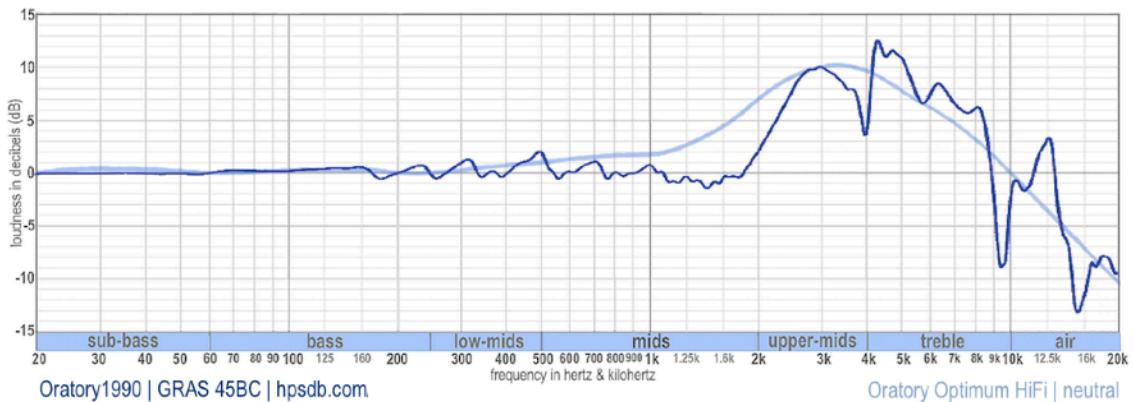


## Hifiman Arya



**Open  
Planar**

Sen: 105  
Imp: 35  
Wgt: 399  
Pri: \$160

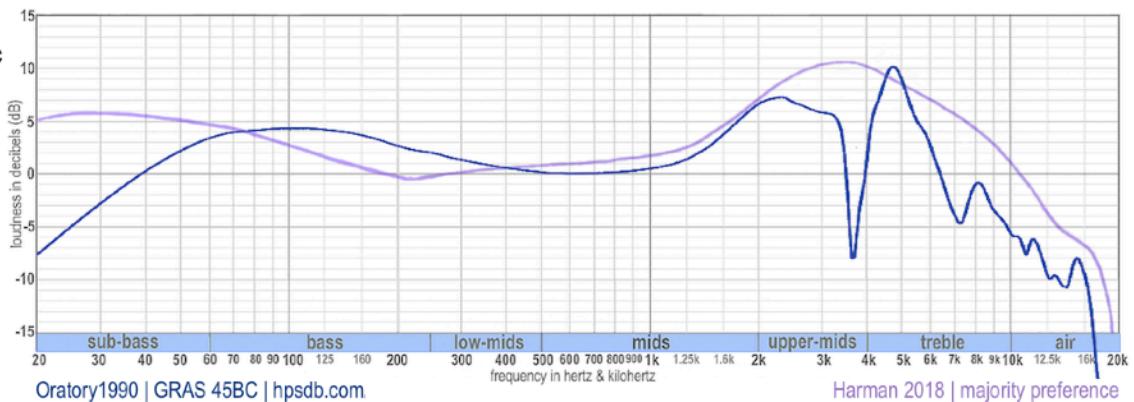


## Koss Porta Pro



**Open  
Dynamic**

Sen: 101  
Imp: 60  
Wgt: 79  
Pri: \$45



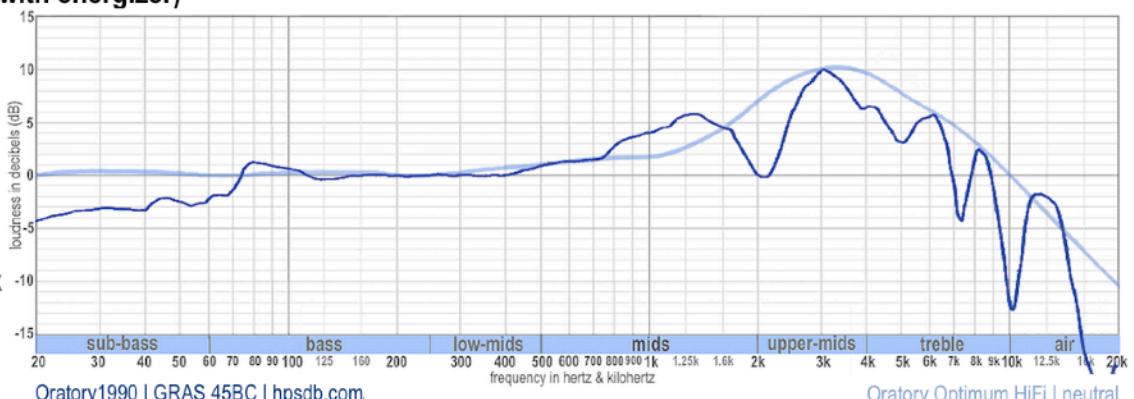
# 50 neutral and extra-bass over-ear headphones

## Koss ESP950 (supplied with energizer)



**Open  
Electro-  
static**

Sen: 104  
Imp: 100K  
Wgt: 353  
Pri: \$999



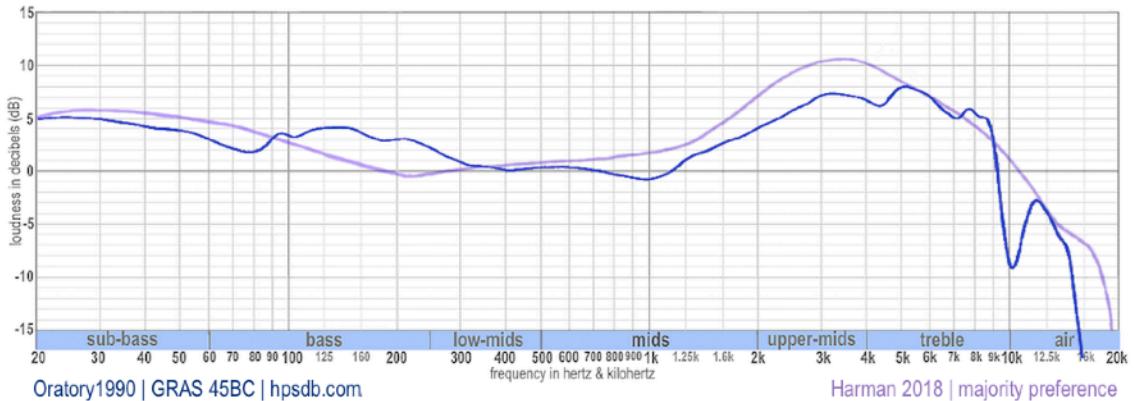
**K**

## NAD Viso HP 50



**Closed  
Dynamic**

Sen: 115  
Imp: 32  
Wgt: 272  
Pri: \$250

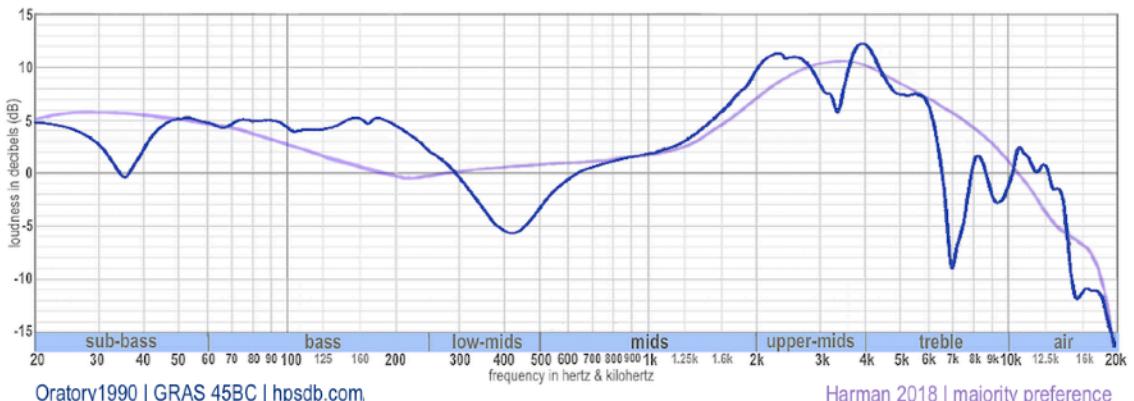


## Oollo S4R



**Closed  
Dynamic**

Sen: 111  
Imp: 32  
Wgt: 382  
Pri: \$390

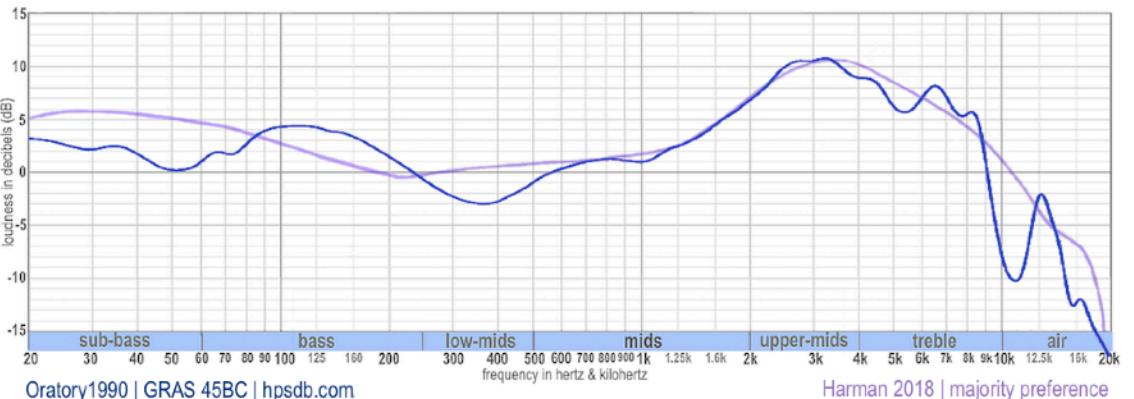


## Oppo PM-3



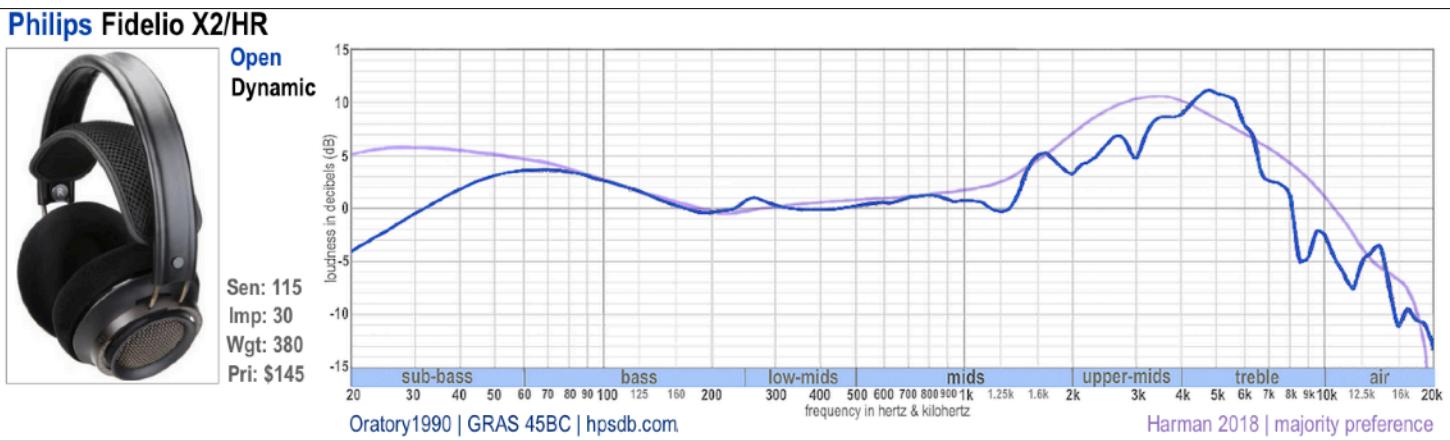
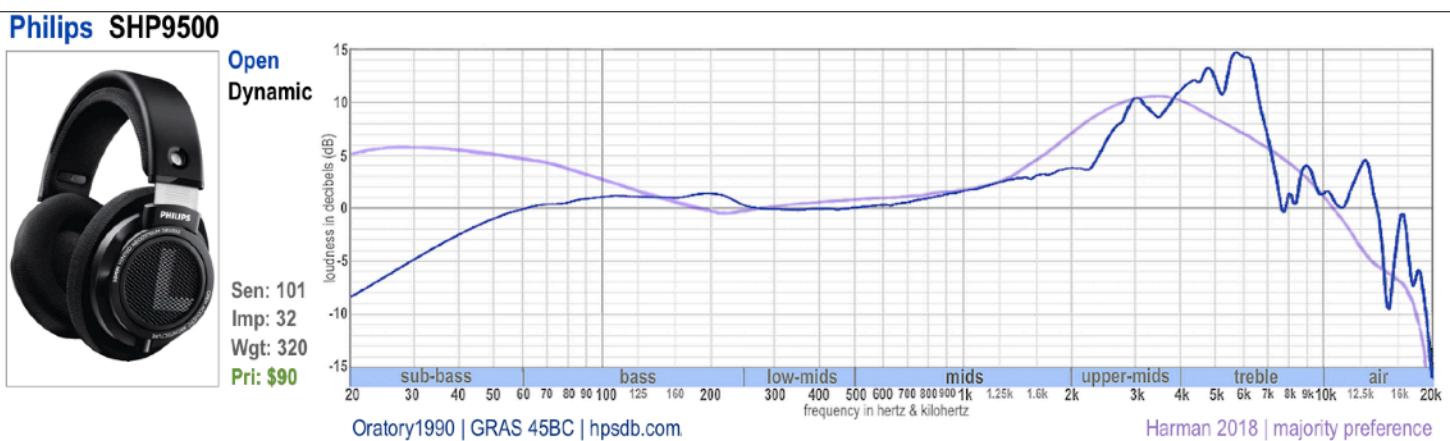
**Open  
Planar**

Sen: 118  
Imp: 26  
Wgt: 373  
Pri: Disc.

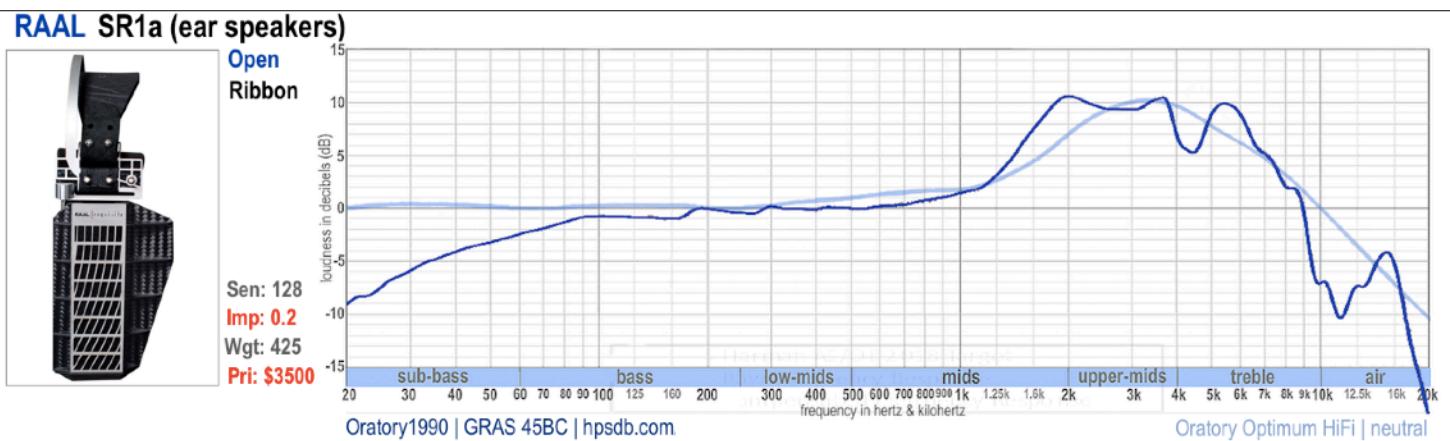


# 50 neutral and extra-bass over-ear headphones

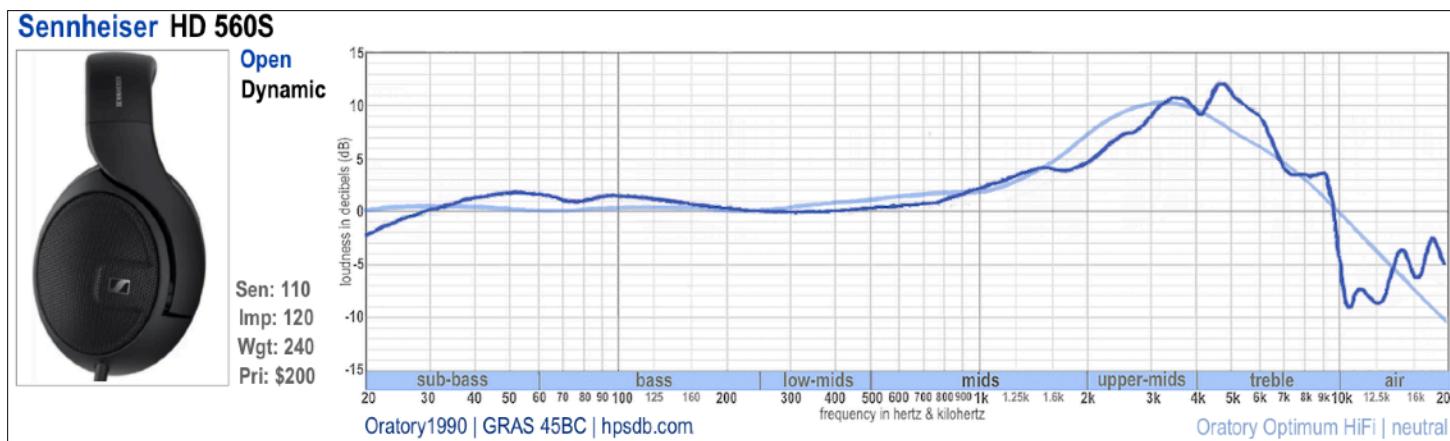
N



O



P



# 50 neutral and extra-bass over-ear headphones

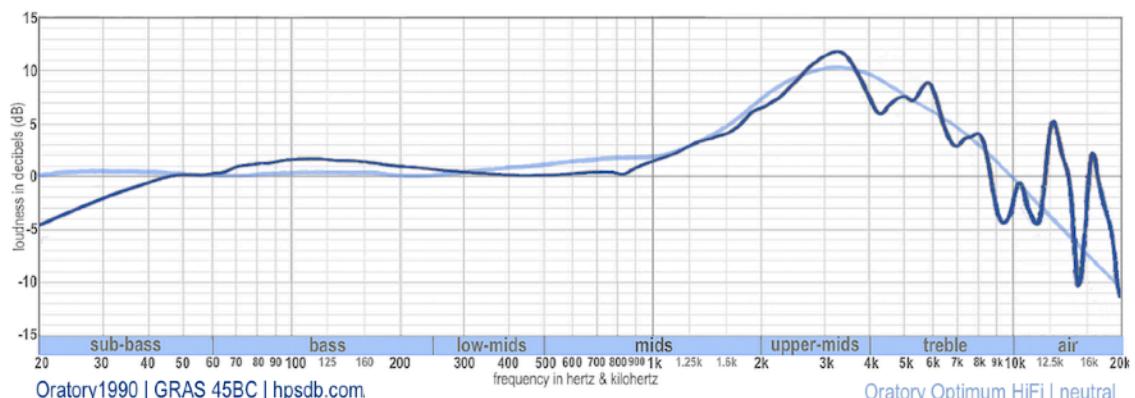
R

## Sennheiser HD 600



Open  
Dynamic

Sen: 104  
Imp: 300  
Wgt: 260  
Pri: \$400



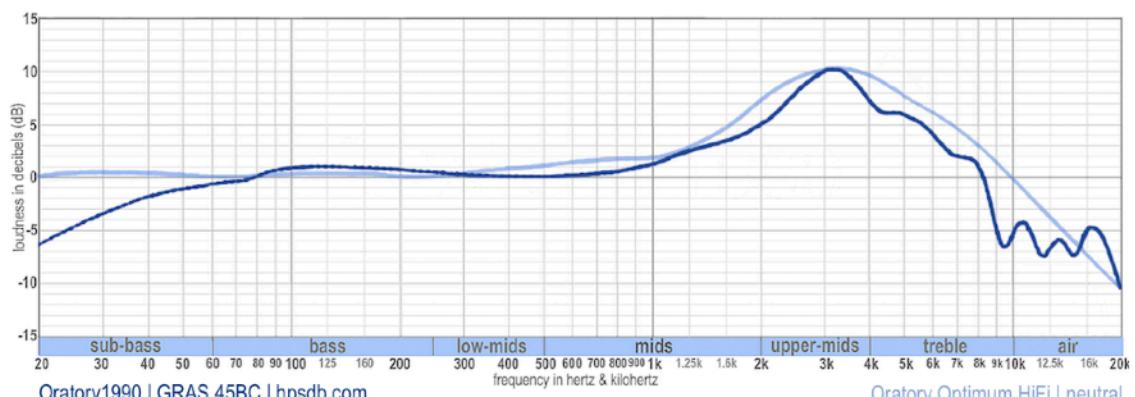
Oratory Optimum HiFi | neutral

## Sennheiser HD 650



Open  
Dynamic

Sen: 104  
Imp: 300  
Wgt: 260  
Pri: \$400



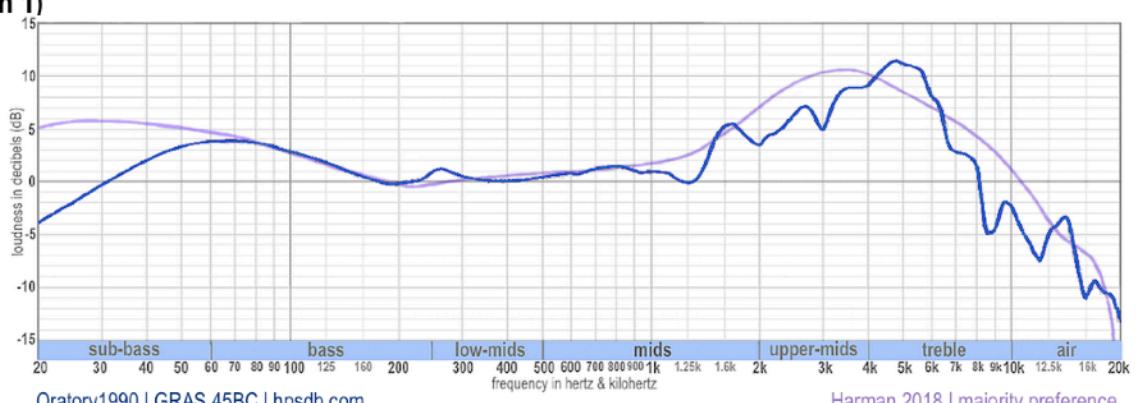
Oratory Optimum HiFi | neutral

## Sennheiser HE 1 (version 1)



Open  
Electro-  
static

Sen: ?  
Imp: ?  
Wgt: ?  
Pri: Disc.



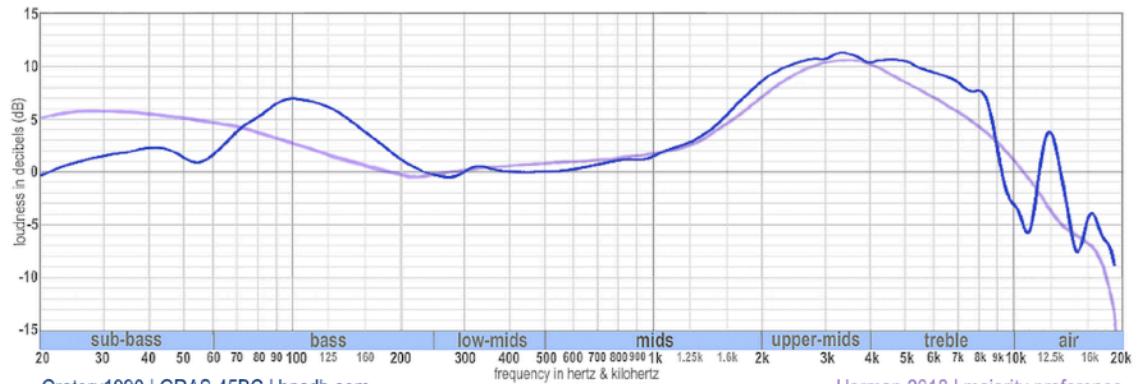
Harman 2018 | majority preference

## Shure SRH840



Open  
Dynamic

Sen: 116  
Imp: 44  
Wgt: 374  
Pri: \$149



Harman 2018 | majority preference

# 50 neutral and extra-bass over-ear headphones

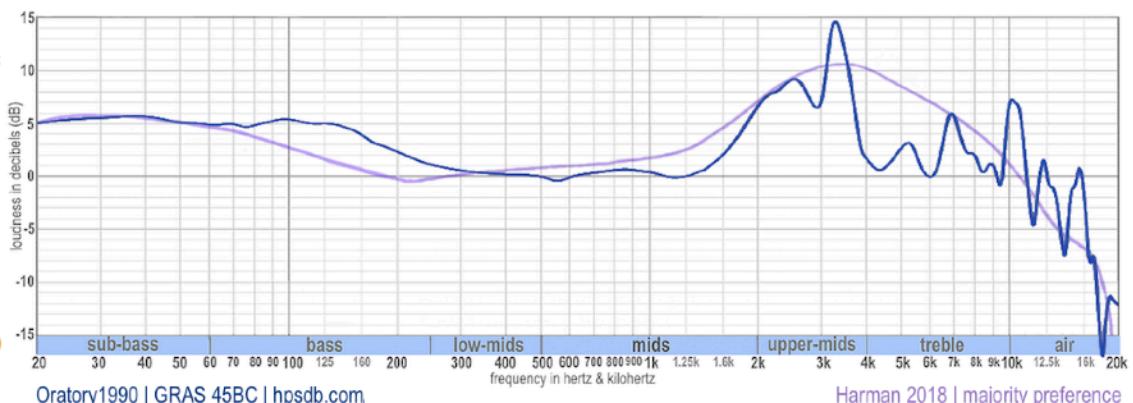
S

## Sony MDR Z1R



**Closed  
Dynamic**

Sen: 112  
Imp: 64  
Wgt: 385  
Pri: \$1800



Oratory1990 | GRAS 45BC | hpsdb.com

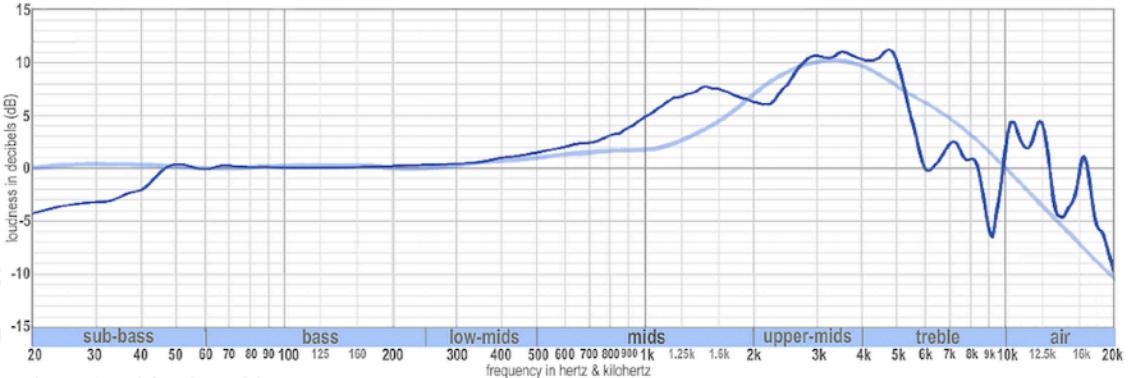
Harman 2018 | majority preference

## Stax SR-009



**Open  
Electro-  
static**

Sen: 80  
Imp: 145K  
Wgt: 441  
Pri: \$4020



Oratory1990 | GRAS 45BC | hpsdb.com

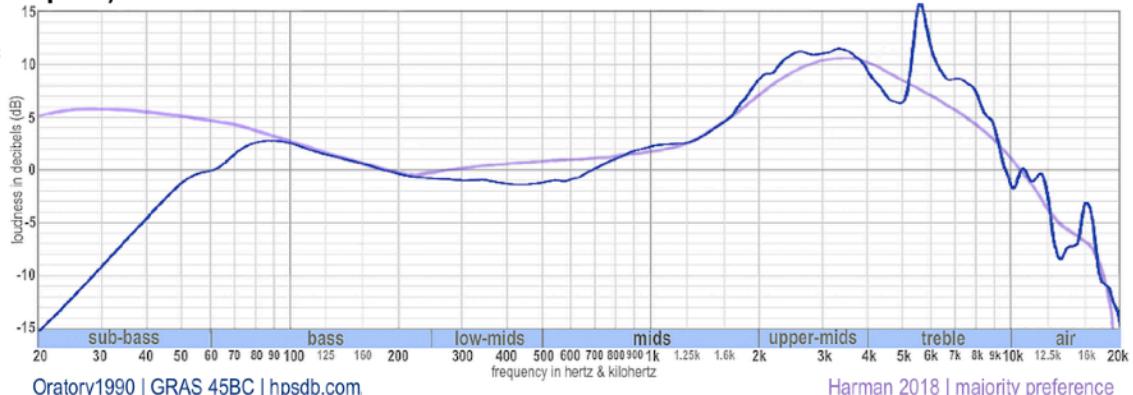
Oratory Optimum HiFi | neutral

## Superlux HD-668B (stock pads)



**Semi  
Dynamic**

Sen: 111  
Imp: 56  
Wgt: 222  
Pri: \$37



Oratory1990 | GRAS 45BC | hpsdb.com

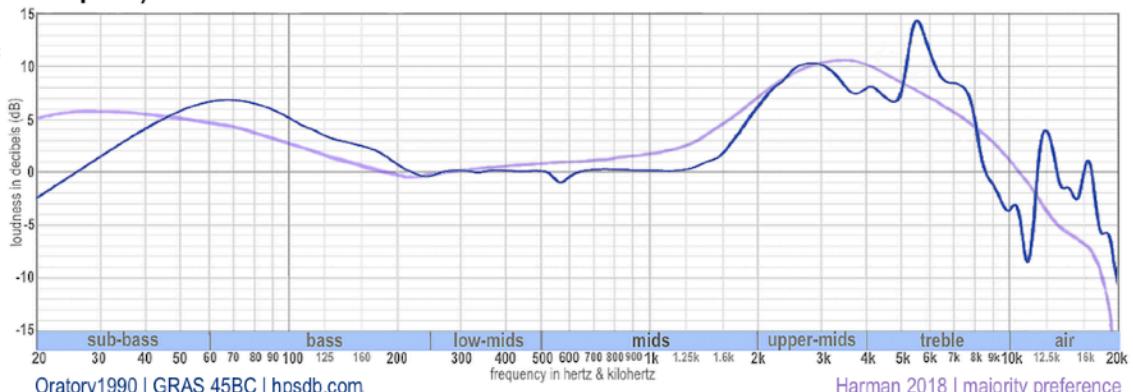
Harman 2018 | majority preference

## Superlux HD-681B (pleather pads)



**Semi  
Dynamic**

Sen: 113  
Imp: 32  
Wgt: 221  
Pri: \$34



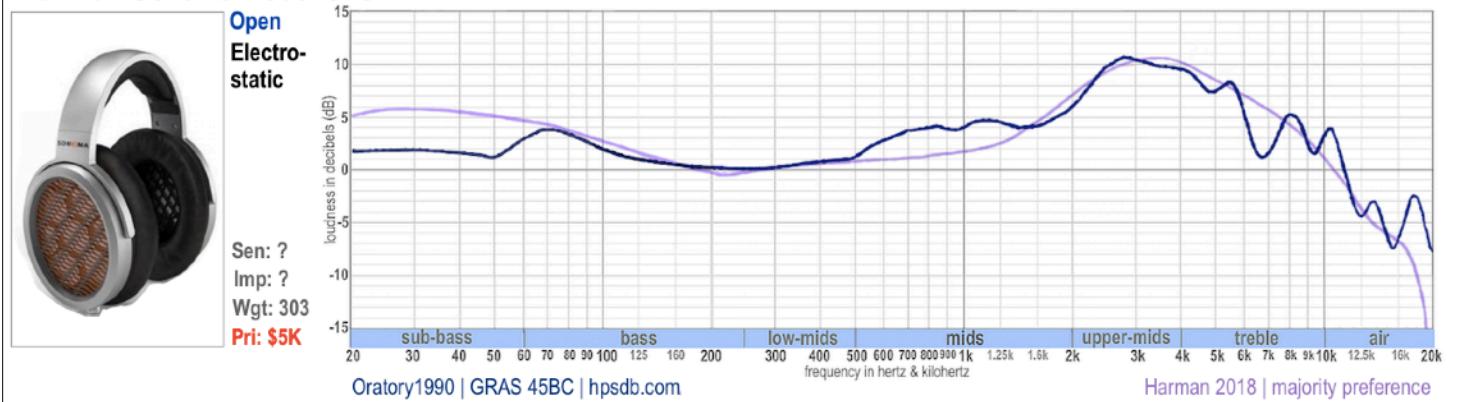
Oratory1990 | GRAS 45BC | hpsdb.com

Harman 2018 | majority preference

# 50 neutral and extra-bass over-ear headphones

W

## Warwick Sonoma Model One



Oratory1990 | GRAS 45BC | hpsdb.com

Harman 2018 | majority preference

Z

## ZMF Auteur (lambskin perf. earpads)



Crinacle | GRAS 43AG-7 | <https://crinacle.com>

Oratory Optimum HiFi | neutral



## Explanatory notes

I explain the rationale for this oddball collection of headphones starting on page 12 of [Wrapping your head around the whole flat/neutral/Harman thing](#).

**Note:** this resource doesn't tell you anything about sound quality, except how much departure the headphone exhibits compared to neutral or consumer preference.

Regardless, you may also find it useful if researching the purchase of a headphone with a relatively accurate/uncoloured frequency response. If frequency response graphs look confusing or intimidating, you might want to read my tutorial [The Skinny on Headphone Frequency Response Graphs](#). The general idea, however, is simplicity itself. If the jagged line of the headphone measurements goes above or below the pale blue or purple smoothly curved line, that's a possible source of concern. The labeling in the blue bar at the bottom shows you where from bass to treble a given area of concern lies. Headphones with a pale blue reference curve are best considered if you're looking for all-around accuracy/neutral. The pale purple reference curve shows what a reasonable amount of boosted bass looks like, including especially where the boost should taper off to zero.

That said, a common mistake is to assume that the *amount* of bass loudness tells the whole bass story. In fact, a headphone with a very incisive, resonant bass *quality* (like many planar magnetic models) can be more satisfying without a loudness boost, than other headphones with bass that is only boosted in *quantity*. This points to the limitation of frequency response graphs. They give a lot of information about one dimension of the headphone sound experience, but none at all about other dimensions, such as stereo imaging, dynamics and transients. They also don't tell the complete story on detail/clarity — although serious deviations in frequency response are absolutely culprits in muddying the detail waters.

## 50 neutral and extra-bass over-ear headphones

Another caveat regarding the graphs is that both the sub-bass and the air regions on the far left and right seldom come into play. No voices and very few instruments (or even natural phenomena) produce sounds at either extreme. These are also areas in which even the best measuring equipment has serious limitations.

Another, practical, issue is sound isolation. Each headphone has an indication of open vs closed. **Open-back** means the headphone allows at least a significant amount of sound to spill out into the surrounding air. So an open-back headphone is already a non-starter in situations in which you need to keep from annoying other people. But for sealing *out* external sound, even **closed-back** models vary drastically in effectiveness. Headphones with a porous ear pad construction allow sound to leak in.

As well as the graph, each headphone model includes a short list of sensitivity, impedance, weight and price numbers:

**Sensitivity** expressed as dB<sub>SPL</sub>/1Volt (rather than the more common dB<sub>SPL</sub>/1mW) directly corresponds to the loudness dial on your device. For a portable player like a smart phone, any sensitivity number over roughly 98 to 100 should work just fine. (These devices typically output 1.2 volts).

**Impedance** essentially shows how much electrical current your headphone requires to produce sound. Here values that are too *low* are of concern. Anything under roughly 30 (Ohms) has a good chance of demanding more sustained current flow than an unaided portable player can deliver.

**Weight.** It's impossible to express comfort/fit in a simple way. Weight is just one aspect. But headphones weighing more than a pound (454 grams) are fairly likely to be problematic for a long listening session.

The **Price** given for each model is its US dollars list. This gives you a general idea whether a headphone is even worth looking at, depending on your budget. Many uninitiated into the depths of the headphone enthusiast microcosm will be flabbergasted that such a thing as a headphone selling for more than \$500 dollars even exists (let alone the roughly \$60,000 of the current model Sennheiser HE 1). Nevertheless, for the headphones in this collection evidence suggests sound quality scales with price — just not linearly, especially after \$1000. Law of diminishing returns.

**Worn** vs **fresh** ear pads: at this time the graphs for the DT 770 and DT 880 are the only measurements available for pad wear. It is not possible to generalize that other headphones would exhibit similar pad wear. We know anecdotally that the HD 6-series has had similarly profound changes with pad wear over time. Some headphones with memory foam ear pads may exhibit very little change. My beyerdynamic DT 1990 has Visco memory foam inside the ear pads and have had 2½ years of extensive use. I can tell by how well they EQ based on the graph in this collection that they still sound just as the graph shows.