

What's your opinion about HiEnd-Audio?

A text against the commercial brain wash

by Barbara E. Gerhold, "TUBECLINIC"

A Foreword

There are a lot of myths, which are not questioned by most listeners, readers and Audio aficionados at the web. Well, some of them were stated by well-respected Audio designers, but most derive from merchandizing as well as PR departments of sudden companies.

If you want (resp. need) to get to the bottom of these myths, you need to ask more. I shall present a list of such myths and try to give you an overview about their substance.

1. Speaker

- Drivers of a speaker must be chosen (and selected) according to their narrow bandwidth in which they represent a linear performance.
Two-way is for connoisseurs (and very expensive if done well, extra expensive if designed for studio monitoring), three-way is for the broad public and four-way is again for a more sophisticated circle. All beyond four-way makes no sense.
Sensitivity resp. efficiency does not make a difference, because we have amps of nearly infinite power on hand.
 - ☞ A statement from the merchandizing department! You might see the expression of its price tag within it. The more drivers are used, the "more" cross-over will be needed. The more parts are involved in a system, the more failures must be present. Parts selection could reduce the failures but will again increase price. OTOH less makes less failures. Therefore, the starting point of a full range driver really makes sense.
In the case of sensitivity we can observe, that the driver with the bigger sensitivity will generally present the better detailed performance. This comes from the fact, that the ability of a driver to make sound from a smaller input will always give more of these small details, which will be hidden in case of less sensitivity. More power input will not heal the wound. But well – full range drivers of top sensitivity will again cost top money!
- Backloaded-horn-speakers (BLH) are not suitable for HiEnd Audio, due to their inherent distortion and non-linear behavior. The same is often told too about cut resonators (CR) and open baffles (OB).
 - ☞ Do you know the story about the fox and the grapes? This is a similar story. Since most companies are not able to design a supreme horn-speaker they will tell you, that these speakers are not worth to consider ... And well admitted, horns are somewhat big too – a quality that sellers hate like the devil hates holy water.
 - ☞ I defined three markable cornerstones for judging a speaker, if it is worth to be tested:
 - * Sensitivity (SPL) of the driver must be $\geq 96\text{dB @ 1W, 1m}$. That's necessary for that small power SEA-tube-amps too can be used as well as CSA.

- * It must be a FullRange-driver with suiting parameters for a BLH and for connection to a CSA
- * Diameter of the FR-driver ≥ 30 cm or 12" (or more pcs. with equivalent area) to give sufficient bass response.

☞ In the real world of HiEnd, BLH are the best solution when top performance is aimed at. The second-best choice is a CR and then an OB. The imaging of an OB is terrific – although the bass reproduction is a little less and a subwoofer is recommended. A Karlson Coupler is also worth considering.

When driving such speakers by a CSA you will startle sometimes as you will suppose the instrument or singer actually **is** in your living room.

2. Amplifier

- ... the more power the better!

☞ PR bullshit! It's always only the 1st Watt that counts!

But you will need to start with asking for the amp's operational class, then for its figures at 1 Watt_{rms} and then you should consider, which power will give you a performance of app. 106dB_SPL. Always drive this direction only.

- ☞ - Class-A is better than Class-AB or Class-D, then Class-B.
- Single Ended (SE) is better than Push-Pull (PP).
- Tube (mostly) is better than Solid-State.
- Triode sounds better than pentode.

☞ Therefore, first and best choice was a tube amp of Single-Ended Class-A, direct heated triode (SEA-DHT). If you chose a BLH in the speaker section, you should prefer a CSA. Figuring out the needed power leads to if you chose a horn-speaker of app. 95dB_SPL @ 1W (or maybe better) sensitivity like from last point, you will find, that only 10W are needed to achieve the pointed out 105dB_SPL in your living room (+10dB or ten times the power will double the felt loudness). Pls. keep in mind, that this is a sound pressure you will only be able to stand for less than 1 min. and that it will call the police to your home ...

- Only buy a set of electronics with lowest possible THD.

☞ Well, again bullshit from the PR department but could be spread by the merchandizing department as well. No hint about which distortion and at which levels? Anyway, the result will be the well-known Solid-State Sound we all hate ...

Under normal conditions a THD-figure of 0,111...% will be optimum, whereas there are 0,1% (or -60dB) of k2, plus 0,01% of k3 (or -80dB), plus 0,001% of k4 (or -100dB) and so on. This mix was proven during numerous hearing sessions with a wide group of interested listeners. But these figures are only possible keeping extreme care for the design and no NFB is applied. Especially if you spare k2, you will spare Intelligibility of speech and imaging too. Most people believe that distortion is bad always, but listening tests show, that all even order harmonics (k2, k4, a.s.o.) only brighten the sound and they increase the imaging as well as the speech intelligibility. Furthermore, they support a basic improvement of listening by slightly compensating the hearing loss of high frequency with increasing age. Even order harmonics should increase with output level. Supreme SEA-Triode amps show almost 10% of k2 at full power and that's highly appreciated by most sophisticated listeners.

Comparable Solid-State PP-amps using NFB will show 0,01% up to 9,75W and then they will slip away into 30% of the awful k3 or k5 at 10W due to sharp clipping. That's the point, why most dealers will tell you, "No problem, simply buy an amp of 100W and you will stay out of

the trouble". What he does not tell you was, that the noise of a 100W amp is much bigger than the noise of the small one and because you normally listen at lower level ... but you know.

- Moving to a stronger amp only will give you better performance at your home.
 - ☞ That might come true, but only if the amp was the weakest part in your former setup. Pls. keep in mind, that only one equipment part, that does not match the above recommendations, will destroy all the good behavior. Simply think about a CD player with its internal OPA I/V - and output-section. Here you catch the odd order harmonics and the loss of their overall declining. It's really like an infection! Only one part of PP-design plus using huge NFB (... spoiler → that's standard with OPA circuits!) will destroy all of its performance. Using an outboard DAC, built from triodes and using no NFB in a SEA design will normally heal the wound.
 - BTW – there are so many audiophiles around, saying that vinyl LP is so much better than all the digital sources. This comes from people who spent a fortune on their electronics and speakers plus a little fortune more for the turntable and the cartridge. Now they make the mistake to compare this setup to their probably expensive and audiophile (merchandized) CD player. And this comparison must fail, due to the facts presented above! Substituting the built-in I/V and output stage by an external DAC showing the above features (e.g. *EL CHEAPO*, *NITRO* or even *NITRO+* from my website) will again cure it. This is also the fact for DSD- and HiRes-Audio Media players. Using 2xHD-DSD files as a source will raise your performance to a step you never thought to be possible before. But well - not from the built-in output stages ...
 - If you are looking for an inexpensive version → pls. have a look for *EL CHEAPO* at my website. It's the DAC-output stage sounding like triode but with no tubes inside.

3. Signal Sources

I. TURNTABLE, PHONO-PREAMP, PHONO-CARTRIDGE AND MC-PRE-PRE

- A turntable needs to show high mass – esp. the platter. The base must sit absolutely flat and levelled, without any lateral buckling.

Only belt drives ensure a friction-free and noise-free drive. Only synchronous motors should be used for the drive - due to their constant speed (mains synchronicity). The quality purchased increases with the price called.

This is also true for the Phono-Pre. Here Solid-State versions (using exquisite and expensive OP-Amps) are the best choice due to their low noise.

For the cartridge there is no way either of MC type. This type gets you the resolution and the utmost information out of the groove. In the case of a MC, you need a MC-Pre-Pre and here again the top choice are the OPA stuffed versions of this little stage.
- ☞ Never heard more bullshit!

Since more than 60 years all the manufacturers of turntables worldwide know how to make a perfect one: Build all moving parts except the platter as lightweight as possible and without any play. Best drive will be a well-regulated (maybe quartz controlled) BLDC (brushless DC-motor) like the old direct-drive by *DUAL*. The platter will be best in the 3 – 5 kg range. Depends on if the drive is regulated or not. Regulated direct-drives don't need sooo heavy platters.

Excellent phono-preamps and MC-Pre-Pre are available from many different manufacturers, but the ones with the OPAs are the least suitable – unless you like to listen to the bad "Solid-State Sound". Anyway – tube or FET equipped electronics will do best. Be sure to avoid any overall NFB inside and current sourcing models are again to be preferred.

Personally I would prefer a MD (or MI) cartridge because of their low downforce and the biggest value in compliance possible. Compliance is a characteristic value for resolution, the bigger the better. If a turntable is built along these fore standing marks, a lightweight cartridge needing only low downforce will win the price. In this game modern MM or MD/MI mostly beat MC (e.g. the "2M black" of the "2M series" by Ortofon). Plus – for a MD or MM no MC-Pre-Pre is needed.

If you still decide to use an MC, you should know that every SUT (step-up-transformer) is superior to an active Pre-Pre (because it doesn't add noise and distortion). Unfortunately, most SUT cost more than an ordinary MC-Pre-Pre.

II. MEDIA-PLAYER, CD-PLAYER, DVD-PLAYER AND DAC

- Media players are something for young listeners and actually nothing demanding, CD and DVD players are still in demand - although not as Hi-End as turntables - and external DACs are something for purists, specialists ...

☞ Actually, these are all players for digital recordings. Nevertheless, there are also some differences and differences in quality:

CD players are only suitable for playing the well-known music CD (PCM 16 bit / 44.1 kHz). Some exotics can also play SACD (DSD64). This also applies to DVD player if they are used for the reproduction of music. Normally, the CD format (PCM 16 bit / 44.1 kHz) is no longer considered up-to-date today. Nevertheless, some CD transports (without a built-in DAC) deliver excellent quality via their digital outputs. Blind tests showed that in many cases the quality is significantly higher than that of the LP. Of course, the carpet of dirt noise is completely missing here (which is normal in case of the LP) and the dynamics are also much better with digital media. Not generally and in the peaks, but in the ratio to the noise at the bottom. If you want to improve the result significantly, only better sampling will help and already 24-bit / 96 kHz is a significant step forward. This and everything that is even better is called HiRes (high resolution) and represents the pinnacle of what is currently feasible. For the formats, the gradation from bottom to top is: WAV – HiRes-FLAC – DSD.

For the reproduction of HiRes music you will need a computer (for the storage) and an external DAC (digital Audio converter) or a Media Player substituting the computer. Don't be afraid of the computer in a HiEnd system: Its performance is orders of magnitude better than anything else running in your system!

The DAC and its output stage (esp. the output stage) is responsible for what's coming out. Here again you need to observe the same points as with the Phono-Pre: No NFB and no OPAs – better triodes or FETs of any kind – and again current sourcing devices are preferred.

III. CASSETTE DECKS AND REEL-TO-REEL (R2R) MACHINES

- In the age of digital media, tape recorders are simply no longer up to date.

☞ Cassette devices are no longer manufactured today. Though they are much better than their reputation. They are ideal for copying rare LPs, for example, because the quality that can be achieved with them is a little bigger than the quality of LP. At least with the most recently manufactured device series from some manufacturers. Copying digital music is easier and therefore I would not recommend doing this as a tape copy. Especially for lovers of unusual styles, it is unlikely that a special rare LP will ever be released as a CD or HiRes file. So, what could be more obvious than making a tape copy?

R2R are very expensive, require a lot of maintenance and are sensitive. That's why they were always reserved to professionals. Even today, some R2R are certainly still running in one or the other HiEnd system, but the prices for tape material and maintenance will soon pull the plug of these machines as well.

4. Headphones and Headphone Amplifiers

- It's not worth trying to get very high-quality headphones. The time spent on them does not justify the purchase of a high-quality and therefore expensive product. This also applies to the associated headphone amplifier. But without one, you have to rely on the various headphone outputs on pre-amps and CD players. However, their quality is not so great either, which in turn confirms that the headphones are not so essential either.
- ☞ As far as the time you spend with headphones is concerned, this might even be true. However, only on the condition that you have excellent speakers. But if you want to listen to music late at night at a high volume, it's definitely worth buying headphones.
All the more so because you can immerse yourself in the HiEnd world faster and cheaper with good headphones than with speakers. Again, the above applies to the headphone amplifier stage and since (almost) all headphones are FR systems, it is also worthwhile to look for a CSA (such as the *BAROLO* or the *AQUAVITE*), as a CSA also gives the best results in this application.

5. Cables

- Cables are an intrinsic part of the setup. Only use best quality and you should prefer silver over copper.
- ☞ Quality is really important but silver is not essential, therefore → bullshit!
Some Audiophiles claim, that silver leads to a brighter upper range. Anyhow – I could not sign that though I also use pure-silver RCA interlinks in my own setup.

☞ ***But at first, we need to define about what we are talking here:***

RCA-INTERLINKS

If you have the opportunity, check the capacitance of the cable. If it turns out $>100\text{pF}$ per 1 m length, its quality is questionable. Do not forget to check the plugs too → in some cases found, the RCA plugs showed more capacitance than the cable. These were heavily gilded items, looking very nice at first glance – so pls. be careful!

If you decide to make your own interlinks additionally to good RCA plugs you will need shielded cable of similar quality level. I take MIL 59 LSNH (by ARNOFLEX et al, $75\ \Omega$, with litzwire for central conductor)ⁱ for this task.

SPEAKER CABLES

I would never buy such! Braided cables are really easy to make and they are mostly MUCH better than such from the market. Pls. see my article about at my website!

* If for a standard VSA ⇒ use 3 wires 4mm^2 and loose braiding.

* In case for a CSA ⇒ use 3 wires 1mm^2 and again loose braiding.

Connect the 3rd wire only at the speaker side to the GND-wire and keep the other end open. This will make for a "compensating-line". Attach good 4mm banana-plugs to both ends and cover the whole speaker cable with a nylon hose made of elastic mesh and of suiting diameter.

POWER CABLES

I would only recommend shielded power cables. Either directly from the market or DIY.

If you decide for DIY you need to purchase a suitable set of connectors and a shielded cable (best use LIYCY 3G1,5 mm^2 or ÖLFLEX® CLASSIC 100 SY 3G1,5ⁱⁱ) from a reputable manufacturer. Connect it to the plugs/connectors and be sure to connect the shield to earth-wire (yellow/green) only at the mains-side (equipped with the SCHUKO-plug). No current must be able to flow through the shield. Therefore, the shield is NOT connected to the side of the device.

Keep the same order of colors to connection pins throughout all your power cables.
The color-code of the individual wires is standardized as ⇒

earth-wire	PE	yellow/green
phase	L	brown
neutral/MP	N	blue

ⁱ Technical data ⇒ [RG59 B/U vs. Arnoflex 59 LSNH - Wissen rund um Koaxialkabel](#)

ⁱⁱ Technical data ⇒ [ÖLFLEX® CLASSIC 100 SY](#)