



Audio Note™ Audio Quality Output Transformers

Important News 1.02.2009

In spite of all this the good news is that as a result of lengthy collaboration with our suppliers in Sweden/Czech Republic/Japan/USA we have developed two far superior versions of the standard HiB material that we have been using so far in our basic C-core transformers, a material which has also benefitted from our research into heat treatment, so even the basic HiB c-cores are now better than ever!

Both of the better HiB materials are so good that they exceed certain aspects and approach other aspects of AN Perma 50% nickel material we currently use and are actually better than some nickel materials we have come across and whilst sonically not as good as our AN-Perma 50, although the sonic difference is really only clearly manifested when we use silver wire on the nickel cores, so we shall no longer be offering Nickel cores with copper/copper windings, as it is a cost ineffective solution compared to all copper wound bobbins with AN Ultra HiB c-cores, they are both a great improvement on anything else we have tried, unfortunately delivery on the finished C-cores is quite long, but we had the first 3 tonnes of each in a couple of weeks ago and are now able to ship transformers in finished products and for DIY units with all three materials, see pricelists elsewhere, the new HiB are,

AN Improved HiB , replaces the previous version, on which it improves about 30%

AN Super HiB , is new, and falls between the above and the Ultra HiB, performance wise a very good value.

AN Ultra HiB , better in some respects than the 50% nickel cores, mainly when using copper windings, but even with silver windings the Ultra HiB has more bass depth.

A Direct Comparison between the HiB and the 50 & 55% Nickel Materials.

The nickel cores are more subtle and provide a lower "gate" allowing low level signals to pass more easily and evenly, all the HiB materials are slightly "lumpy" in this regard in that they do not seem to be neither as linear at ultra low levels nor do they "dig" as deep, a fact which is also borne out when you look at the BH curve for example.

This difference in audible behaviour is particularly obvious when using a fully silver wired bobbin, which is why we now only offer these with the nickel cores and the Ultra HiB.

The difference between the 50% and the 55% is not subtle either, although I have to say that unless the rest of the circuit is maxed out with the best possible parts and the amplifier is used in a system with complimentary equipment, it may not be as obvious.

The main difference between the two nickel materials is not just in the slightly higher nickel content but in the way the two materials are heat treated after the c-cores are wound and cut, the 50% nickel uses a fairly traditional 6 stage heat treatment process, whereas the 55% uses a lengthy and complex 12 stage heating and cooling process where the last stage is bombardment with radioactive isotopes at very low level, this we have found to enhance the low level behaviour considerably.

What is important to point out is that where "normal" core materials are normally judged by their saturation behaviour, our c-cores are designed to optimize the low level behaviour which is where an audio signal starts, for us it is not all that interesting whether a material is linear will into its magnetization, it has to treat the signal content equally well where it starts.

Other News & Changes.

**The only other real piece of news is that the smaller TRANS-320 type transformers have been discontinued, they will be replaced sometime in 2008/2009 by different designs.

Not much to report apart from the small news that we have now finally found someone who can make solid copper frames for the output transformers, see below, these will now be standard issue on all of our C-Core output transformers, bear this in mind when you compare old and new prices, please.

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Now come as standard on all Audio Note™ c-core transformers.

The Transformer Group Determines Quality

I think it is relevant to point out that Audio Note™ is the ONLY manufacturer to conceptualise, design and develop its audio transformers to directly optimise the behaviour in conjunction with the audio circuits in which they are intended to be used in, because whilst that are a (dwindling, sadly) number of companies around the world who design and make transformers for various uses, not a single one of these companies actually know much about the circuits into which their products go and they are therefore designed to an average standard set of criteria which does not attempt to get close to the best possible or even optimised performance, as this is only possible if the transformers are looked at together with the behaviour of the accompanying circuit and that includes in particular the magnetic coupling with the newer HiB and especially the nickel steels, which are rarely used as they are considered expensive and their benefits are poorly understood mainly because they do not measure appreciably better using standard criteria like frequency response.

Let me give an analogy to what I mean, when I say that off the shelf transformer manufacturers cannot make the very best, imagine a car manufacturer buying the same standard ratio gearbox for all their cars, regardless of the engine's power and torque behaviour, this would not only be unthinkable and would also be exposed pretty quickly as cutting corners, in audio valve amplification, however, IT IS THE STANDARD PRACTICE, not the exception, partly because it is much harder to expose when everybody is doing it, especially when there are no alternatives, there is now, Audio Note™, because we do not believe in half measures!

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PARTS CONNEXION



I know I have been saying this for years but we really are in the process of building up the full range of Audio Note™ audio transformers, in order to offer the best possible outputs at different pricepoints, they will fall into the following categories,

Group A.) Economy range, where the price/quality relationship is carefully calculated to ensure audio quality in a compact package, initially we will only be offering 3 single-ended output transformers in this range, push-pull outputs are under development as well.

Group B.) Mid-price range, which are the output transformers already on offer the range has remained static for many years now, that is about to change, so watch this space.

Group C.) The higher categories offer a choice of either copper primary and secondary, copper primary with Audio Note™ pure silver secondary or fully Audio Note™ silver wired bobbins, all are offered with a choice of different core materials, all the transformers are wound in-house and can be fitted with any type of core listed below, no push-pull outputs will be offered, unless demand requires it and even then I think it is a waste of time and especially money.

Specifications & Abbreviations

The quality criteria for group A are 20Hz to 20KHz -1 to -1.5dB, they are IE cored with silicon steel laminations and are supplied with frames and solder tags, which will allow good audio quality at the cost. The main cost saving being the use of a smaller core, specified to the exact power level required, rather than overspecifying by 50 or 100%, as we do on Group B, the winding quality and copper wire is the same.

Group B are typically 20Hz to 40KHz minus 1.5dB, IE cored with high quality silicon steel laminations, wound with oxygen-free copper wire and supplied with either bell-ends or frames always with flying leads.

Group C are typically better than 8 Hz to 70KHz minus 3dB and come as specified below.

PP = Push-Pull. PPP = Parallel Push-Pull. SE = Single-ended. PSE = Single-ended Parallel. UL signifies 43% ultralinear taps, as a general rule we do not condone the use of UL-taps, as we consider these detrimental to sound quality.

All primary impedances are calculated for Class A operation, with the main consideration given to maximum dynamic power transfer ability and minimum distortion, rather than meaningless steady state sine- or squarewave conditions.

All Audio Note™ single-ended output transformers are airgapped, and the maximum standing current allowed before saturation is shown in column 5.

All Audio Note™ output transformers are tested to insulation levels of minimum 3,000 volts, all 211/845 outputs are insulated to 5Kv flash, every transformer is tested to this level of insulation.

We generally overspecify our transformers by 50% power in Push-Pull (which means that a transformer stated as 25 watts will not saturate at stated power but will allow about 35-38 watt unsaturated peaks, our single-ended outputs are generally over specified by at least 100%, which means that they will instantaneously allow peaks of well over double the given maximum power through undistorted, this is necessary due to the far better voltage swing ability and clipping behaviour of the single-ended triode output stage.

For more insight to this look at the article about the issue of power delivery of valve amplifiers in general and the SET 300B's in particular, the results are rather startling and controversial, some of the article written by the Dutch reviewer Peter Van Willenswaard has also appeared in Stereophile, but the article here is more in depth.

We do not give any further technical information on our output transformers, as we do not wish to take part in technical competitions, our products are designed to criteria which are and will be understood fully only once they are listened to!

Sizes are given as Width/Height/Depth, where depth is the depth of the coil itself and width is the length of the core. Peter Qvortrup | 1st February 2009

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