AUDIO NOTE™
AUDIO QUALITY OUTPUT TRANSFORMERS.

News 02.04.2017

For us at Audio Note™ the deteriorating pound is helping to increase the pain already caused by rising commodity prices, these have now levelled off, only for the pound to take over. So at a time where we have had to swallow much higher prices for copper and silver wires and electrical steels, all HiB and nickel types especially, availability has also become more restricted, so we have experienced longer delivery times as well as rising prices, so not only have we had to pay more for the materials we use, but we have had to hold more stock to ensure that we have stock to bridge the, in some cases, much much longer delivery times, a trible wammy so to speak, higher prices, longer deliveries and greater minimum purchases, all in one, phew!

In spite of all this the good news is that as a result of lengthy collaboration with our suppliers in Sweden/South Korea/Japan/USA we developed from 2009 onwards three greatly improves versions of the standard HiB material that we have been using in our basic C-core transformers since the late 1990s, a material which has also benefitted from our research into heat treatment, so even the basic HiB c-cores are now better than ever!

All 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 differences are really only clearly manifested when we use silver wired bobbins on the nickel c-cores, as a result 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.

The HiB versions are,

AN Improved HiB, replaces the previous basic HiB version, on which it improves ay least 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.

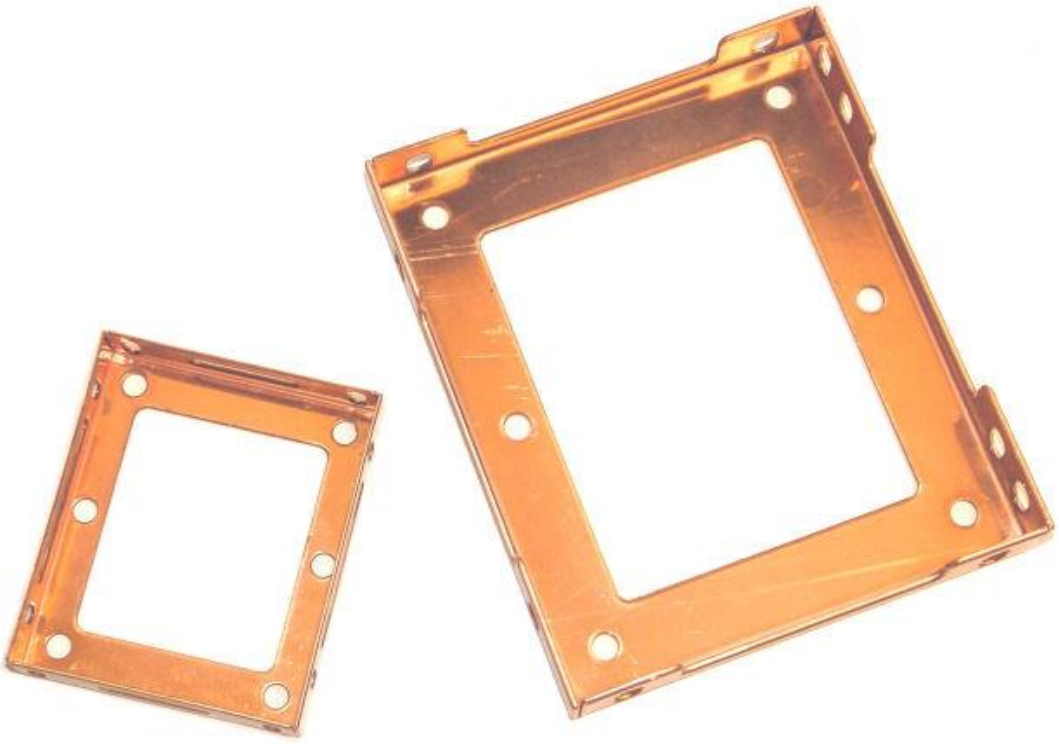
The difference between the 50% and the 55% is not subtle either, although I have to say that unless the rest of the circuit is maxed out with the best possible parts and the amplifier is used in a system with complimentary equipment, it may not be as obvious.

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 well up its magnetization curve, in our book the way it treats a signal when it starts is far more relevant as this has a direct impact on how its low level signal linearity, which in audio what matter to retain signal integrity.

Solid Copper Frames & Shrouds

We have now finally found someone who can make solid coper 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.



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 there 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 are

used and they are therefore designed to a set of average standard 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!

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 input, driver and output transformers at different price points, they all fall into one of 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 20 Hz to 20 KHz -1 to -1.5dB, the basic version are cored with a newly sourced IE lamination made from the same grain oriented silicon steel 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 20 Hz to 40 KHz 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 70 KHz 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 detriment 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.

AUDIO NOTE™ STANDARD AUDIO QUALITY OUTPUT TRANSFORMERS.

Group A Single-ended Outputs.

Order Code	Recommende Valves	Max Cl. A Pov	Primary/Seco ry Impedance	Size	Max. Current
TRANS-144	300B/2A3/ 6B4G	15 w	2K5 - 4/8 Ohr	80x67x68mm	90mA SE

Group B, Single-Ended Outputs

Order Code	Recommended Valves	Max Cl. A Power	Primary - Secondary Impedances	Size	Maximum Current
TRANS-152	300B/2A3/6B4G	25 w	2K5 - 4/8 Ohms	117x98x90 mm	90 mA SE
TRANS-180	211/VT4C or 845	75 w	5K - 4/8 Ohms	137x115x145 mm	240 mA PSE

Group B Push-Pull Transformers

TRANS-200	EL84/ECL86/6V6	15 w	8K - 4/8 Ohms	80x67x68 mm	PP
TRANS-185	EL34/6L6G/5881	25 w	6K - 4/8 Ohms	88x73x80 mm	PP

Group C, Audio Note™ Double C-Core Output Transformers

Picture shows two TRANS-300 with double C-core and I-E core respectively, plus one TRANS-028 all with optional solid copper shrouds.

Product Ranges, Construction & Mounting details

Bifilar and Trifilar wound double C-core output transformers designed for the 300B or single 2A3 with 2K7 primary impedance and 4 & 8 Ohm secondaries for single ended operation, 90mA Standing Current, 50 Watts.

Size 115 mm x 102 mm x 136 mm, mounting holes centre to centre 87 mm to 84 mm both sides.

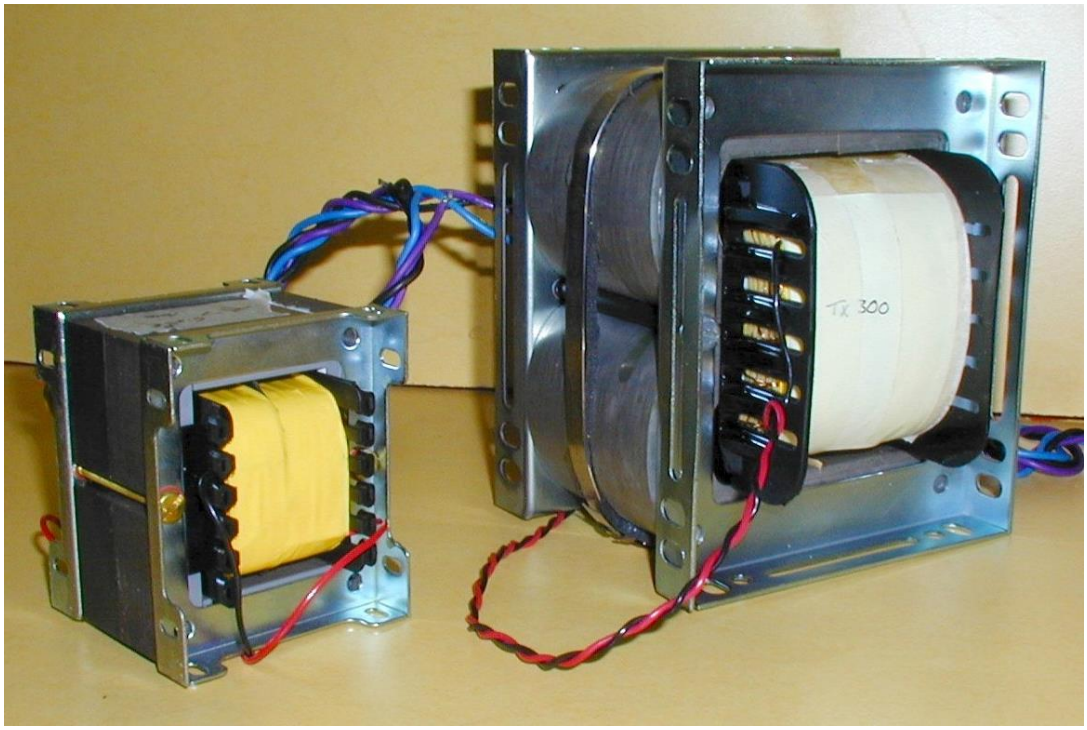
The standard version of the TRANS-300 type output transformers now comes with copper frames, however, as a cosmetically better option we do offer them with solid copper shrouds for an additional £ 72.00 per transformer, the copper shroud being non-magnetic improves not only RF influx, but also low level behaviour as it does not short out the airgap on the higher permeable cores like the AN Ultra HiB and the nickel cores this is essential for optimal performance.

All Copper – Copper transformers have copper lead out wires, Copper – Silver have copper wire on the primary and Audio Note silver leadout wires on the secondary and silver naturally silver wire all round.

Single 300B Output Transformers

Prices are for ONE transformer, not a pair!

Order Code	Recommended Valve	Wiring Primary - Secondary	Core Material
TRANS-300/IE	300B SE, 2A3 SE	Copper/Copper	M4 I-E Core
TRANS-300	300B SE, 2A3 SE	Copper/Copper	AN Improved HiB
TRANS-300/01	300B SE, 2A3 SE	Copper/Copper	AN Super HiB
TRANS-300/01-A	300B SE, 2A3 SE	Copper/Copper	AN Ultra HiB
TRANS-300/02	300B SE, 2A3 SE	Copper/Silver	AN Super HiB
TRANS-300/02-A	300B SE, 2A3 SE	Copper/Silver	AN Ultra HiB
TRANS-300/02-B	300B SE, 2A3 SE	Copper/Silver	AN-Perma 50% Nickel 0.08mm
TRANS-300/02-D	300B SE, 2A3 SE	Copper/Silver	AN Super Perma 55% Nickel 0.08mm
TRANS-300/03-A	300B SE, 2A3 SE	Audio Note™ Silver	AN Ultra HiB
TRANS-300/03-B	300B SE, 2A3 SE	Audio Note™ Silver	AN-Perma 50% Nickel 0.08mm
TRANS-300/03-D	300B SE, 2A3 SE	Audio Note™ Silver	AN Super Perma 55% Nickel 0.08mm

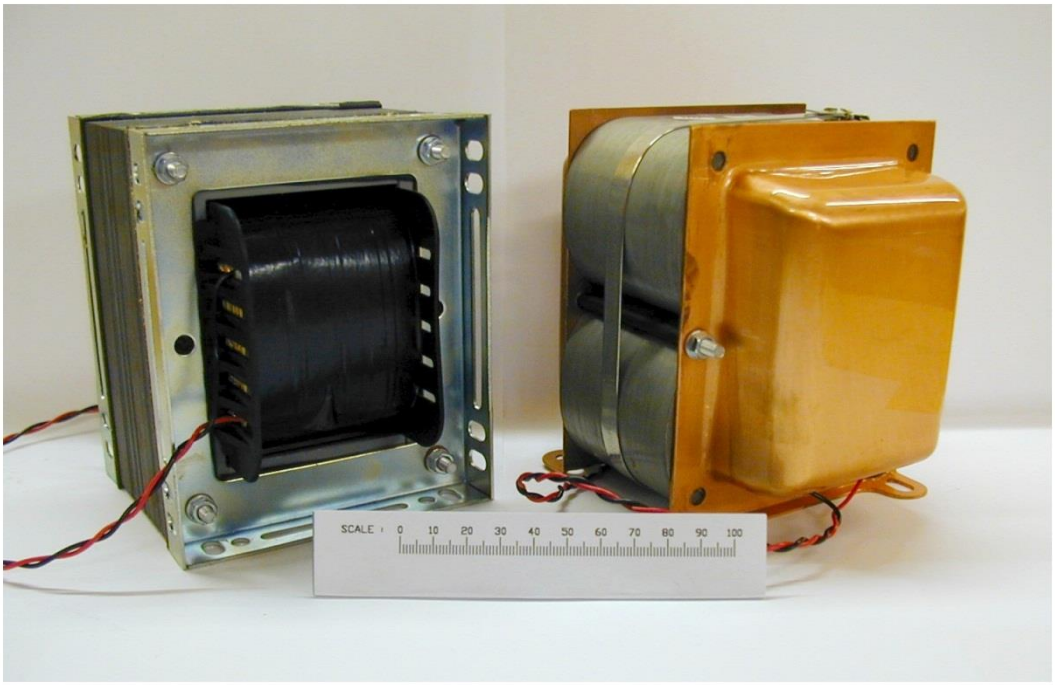


Standard versions with steel frames, copper frames are available at additional cost, see introduction.
Picture shows Audio Note™ I-E Core version of TRANS-011 and C-Core version TRANS-300

Parallel Single-Ended 300B output Transformers.

Group C, bifilar wound double C-core output transformer with 1K25 primary impedance and 4 & 8 Ohm secondaries for 300B or 2A3 in parallel single-ended operation, 180mA standing current, 50 watt, , Size 115 mm x 102 mm x 136 mm, mounting holes centre to centre 87 mm to 84 mm both sides.

Order Code	Recommended Valve	Wiring Primary - Secondary	Core Material
TRANS-305/IE	300B or 2A3 PSE	Copper/Copper	M4 I-E Core
TRANS-305	300B or 2A3 PSE	Copper/Copper	AN Improved HiB
TRANS-305/01	300B or 2A3 PSE	Copper/Copper	AN Super HiB
TRANS-305/01-A	300B or 2A3 PSE	Copper/Copper	AN Ultra HiB
TRANS-305/02	300B or 2A3 PSE	Copper/AN-Silver	AN Super HiB
TRANS-305/02-A	300B or 2A3 PSE	Copper/AN-Silver	AN Ultra HiB
TRANS-305/02-B	300B or 2A3 PSE	Copper/AN-Silver	AN-Perma 50% Nickel 0.08mm
TRANS-305/02-D	300B or 2A3 PSE	Copper/AN-Silver	AN Super Perma 55% Nickel 0.08mm
TRANS-305/03-A	300B or 2A3 PSE	Audio Note™ Silver	AN Ultra HiB
TRANS-305/03-B	300B or 2A3 PSE	Audio Note™ Silver	AN-Perma 50% Nickel 0.08mm
TRANS-305/03-D	300B or 2A3 PSE	Audio Note™ Silver	AN Super Perma 55% Nickel 0.08mm



TRANS-305/IE standard steel frames and TRANS-310/02-C in optional full copper shroud

Single Ended 211, VT4-C & 845 Output Transformers

Group C, bifilar wound double C-core output transformer with 10K primary impedance and 4 & 8 Ohm secondaries for 211/VT4-C or 845 in single-ended operation, 240mA standing current, 50 watt, flash

tested to 5,000 volts, Size 115 mm x 102 mm x 136 mm, mounting holes centre to centre 87 mm to 84 mm both sides.

Order Code	Recommended Valve	Wiring Primary - Secondary	Core Material
TRANS-310/IE	VT4-C/211 or 845 SE	Copper/Copper	M4 I-E Core
TRANS-310	VT4-C/211 or 845 SE	Copper/Copper	AN Improved HiB
TRANS-310/01	VT4-C/211 or 845 SE	Copper/Copper	AN Super HiB
TRANS-310/01-A	VT4-C/211 or 845 SE	Copper/Copper	AN Ultra HiB
TRANS-310/02	VT4-C/211 or 845 SE	Copper/AN-Silver	AN Super HiB
TRANS-310/02-A	VT4-C/211 or 845 SE	Copper/AN-Silver	AN Ultra HiB
TRANS-310/02-B	VT4-C/211 or 845 SE	Copper/AN-Silver	AN-Perma 50% Nickel 0.08mm
TRANS-310/02-D	VT4-C/211 or 845 SE	Copper/AN-Silver	AN Super Perma 55% Nickel 0.08mm
TRANS-310/03-A	VT4-C/211 or 845 SE	Audio Note™ Silver	AN Ultra HiB
TRANS-310/03-B	VT4-C/211 or 845 SE	Audio Note™ Silver	AN-Perma 50% Nickel 0.08mm
TRANS-310/03-D	VT4-C/211 or 845 SE	Audio Note™ Silver	AN Super Perma 55% Nickel 0.08mm

Up to now the recommendation has been that all Audio Note™ silver wired bobbins should only be used with Nickel C-cores as the performance improvement is tremendous, however, with the emergence of the new AN Ultra HiB the sands have shifted, so whilst in general it is still my view that the nickel cores are the best sonic investment one can make, the Ultra HiB has changed the position to the point where the Nickel is really only a good investment, if there is silver in one or both windings, the AN Ultra HiB should be considered as it provides a slightly gentler character with a better/deeper bass character than the nickel irons, bear this in mind when you plan your project.

Believe it or not, I have tried to keep the prices of the above transformers as low as possible, and I would like to remind all of you reading this, that when you consider the fact that a Japanese made ONGAKU™ output transformer would cost at least 3 times as much as the best version of one of the new Audio Note™ silver wired 211SE output we offer above, and that in addition to this our output transformer has not only a better C-core and general specification than the original ONGAKU output transformer, so whilst these prices may seem expensive, the product offered is incomparable to anything on the market both in terms of both sonic and technical quality.

The Audio Note™ output transformers offered above differ from the ones used in production amplifiers in two key areas,

1.) Output transformers in such amplifiers as the ONGAKU™, KEGON™ or BARANSU are carefully matched to three different parameters (I am not at liberty to tell you more than one, frequency response, the other parameters are proprietary, as I do not want our competition stealing more of our technology and ideas than strictly necessary).
2.) We use the C-cores with the best/neatest lamination alignment in production, and whilst this makes little difference to the sound, it is important to appreciate this fact.

All the above transformers are supplied raw in the sense that they are unpotted and with flying leads.

As a rule delivery of the above output transformers is from stock, but dependent on internal usage delivery time can occasionally occur, especially the new custom made AN Perma Nickel cores may be on very long delivery, which can be as long as 16 – 18 weeks, we will normally try to tell you if a transformer is not in stock how long the delivery is likely to be, but in the case of the permeable materials production processes are very complex and problematic, so just beware.