

Development Narrative: (What happened and how, as I went.....)

6/23/2001:) After several months of deliberation I am now really getting to grips with this project. The vacillation has mostly been because I have decided to design and wind my own output transformers. I fairly soon came to the conclusion that I wanted to use double C cores for this job but they are quite hard to find in a suitable size. This stopped me in my tracks for a while. However, a 'phone call to Jenny Booth of Booth transformers, UK put me onto a surplus dealer in London who had just what I was looking for! Size 7024-2 Hipersil C cores.

6/24/2001:) I have built the drive circuit on my breadboard set-up and done some tests. The results are really pleasing, especially since they are achieved without the aid of negative feedback. (OK if you are sharp, you will notice the unbypassed cathode resistors on the pre-drive stage which provide some 0.9dB of degeneration in that stage only.) Most credit really, goes to the performance of the Bartolucci interstage transformer.

THD at 100Vrms / 1kHz **0.08%**; -0.5dB: 20Hz to 36kHz; -3dB:<10Hz to 110kHz. The waveform at 10Hz / 100Vrms is good. In addition to this the square waveform at 10kHz is really excellent and with very little rounding and no ringing at-all. These tests were performed into a 50k / 120pF load. The 120pF is a little higher than the total input capacitance of an 845 which they are to drive. The measurements were taken using a HP339a distortion test set which has been calibrated within the last two years.

6/28/2001:) I took a look at the distortion residual from the drive circuit (available as an output from the 339a). Although the THD is extremely small, I was not too happy with the appearance of the residual which, (displayed on a dual channel CRO over the fundamental) indicated strong presence of 3rd harmonic in the spectrum. So I tried reducing the bias current in the EL34 and at 35mA, the residual became a very clean sine wave of twice the fundamental frequency meaning the THD is almost entirely 2nd harmonic. This occurred at 35mA. The lowest THD occurred at 64mA, any further increase in current causing the THD to rise once again. The corresponding SMPTE intermodulation distortion readings were 0.5%, 64mA and 1.1%, 35mA. It will be most interesting to see how varying the drive stage bias current affect the performance of the completed amplifier and more significantly, the sound.

{ SMPTE intermodulation distortion test: The amplifier is fed a dual tone signal, 60Hz and 7kHz in a 4:1 ratio. The intermodulation distortion is the percentage of the residual RMS measured at the output (after filtering the test tones out) compared with the total RMS measured at the output. }

7/14/2001:) The 4 sets of C cores have arrived and I have made the bobbin for the first transformer using fish paper. The end cheeks are glued to the former using epoxy. I also have obtained the various gauges of double-enameled wire, a reel of mylar tape and have ordered the teflon film (at hideous expense!). I am now working on a coil winder...

7/23/2001:) I have started winding, go to "Transformer" page for more details.

7/30/2001:) MKI transformer complete, narrative and test results at "Transformer" page.

8/3/2001:) Photographs of OPT with 845 test amp. On the bench I am getting 24.5W into 8 Ohms at 3% THD. This is good for an SE amp and I am very pleased. I may take some IMD measurements later for the sake of interest.

8/16/2001:) MKII transformer details at 'Transformer' page.

9/8/2001:) MKIII transformer performance at 'Transformer' page.

9/21/2001:) Construction started, see photos above.

10/14/2001:) Amp powered up for the first time, stereo SE DH triodes, glorious!