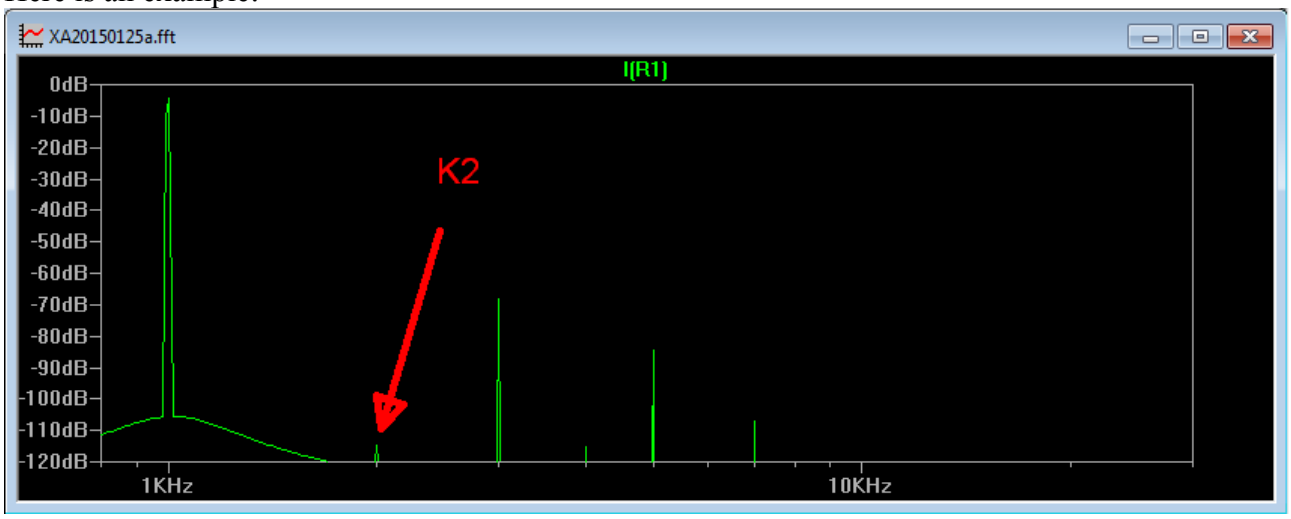
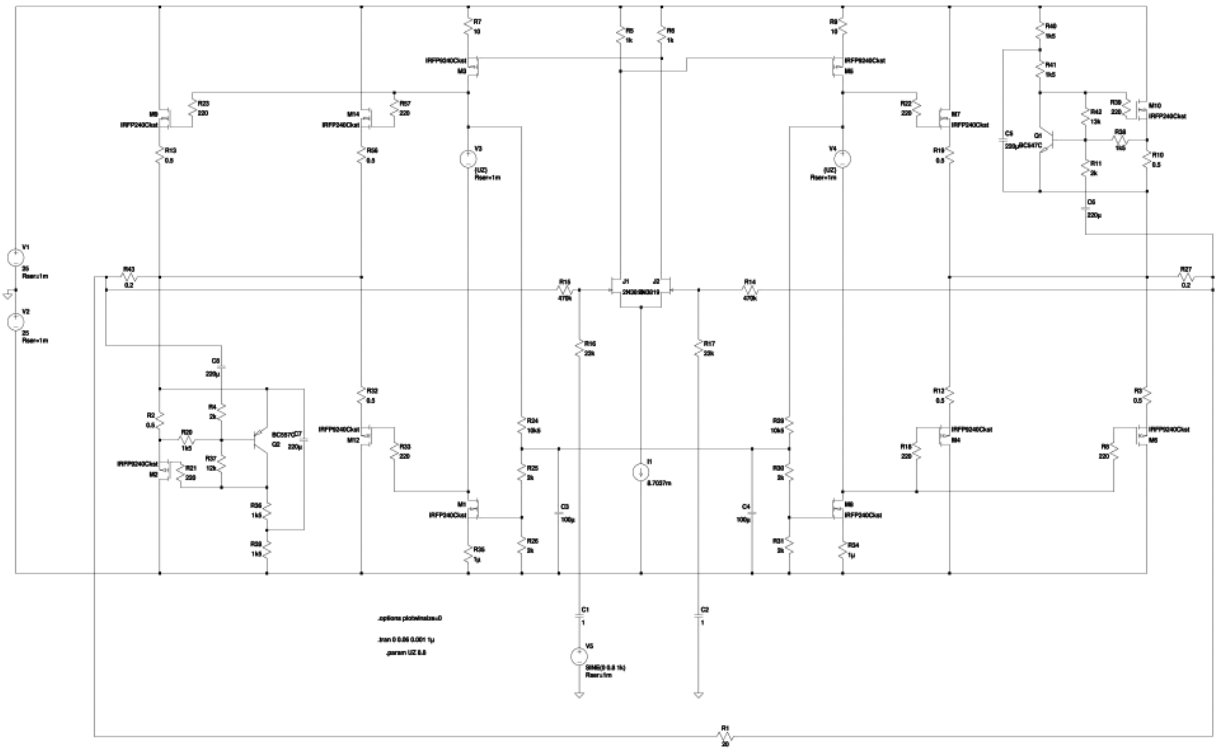
As lhquam and I have reported here we had big problems to get second harmonic distortions in a bridged amplifier. Whenever I tried to scale up the XAgenerated20.....asc (post 149) or the "Balanced PP /SE Hybrid Output Stage" ("BaPPSEHOS") from post #119 to appropriate output power the second harmonic has fallen dramatically in simulation.

Here is an example:



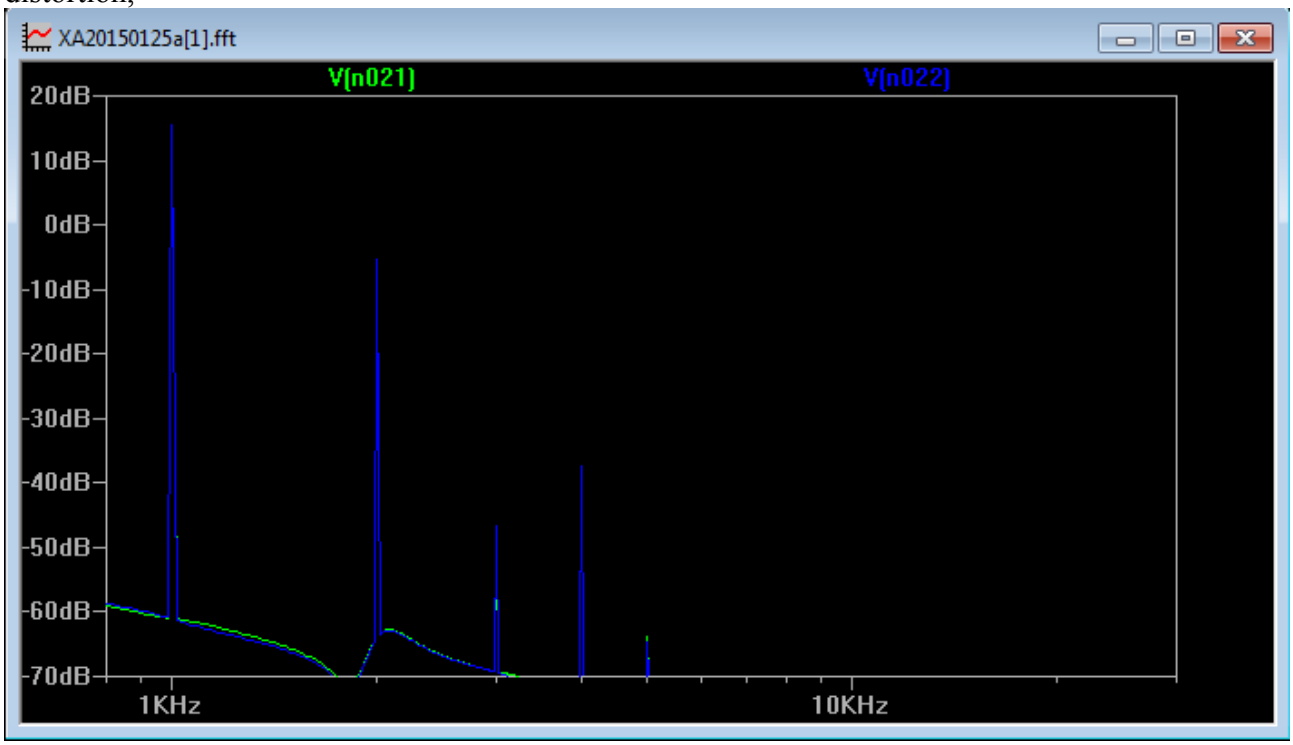
File XA20150125a.asc shows the circuitry with Aleph current sources in the BaPPSEHOS – they are more flexible than usual current sources (please open the file XA20150125a.asc in LTSpice for better resolution):



Because in these attempts I largely only increased the current in the push pull output section, I thought that the strange behavior (the strong cancellation of the second harmonic) was caused by the output stage or the simulation models.
But that was wrong.
Reasons:
1. After the last update in the simulation models I checked the precision of the simulation results by

comparing simulation results with data of the FirstWatt F1 amplifier measured by Nelson. (http://www.firstwatt.com/pdf/prod_f1_srv.pdf) The simulation file is appended. I was very astonished on how precise simulation is. I got nearly exactly the measured results.
So it is very improbable that the afore mentioned strange behavior is caused by simulation.

2. The BaPPSEHOS is not a clean differential stage so it will not cancel second harmonic completely (see pdf-file in post #149): the PP part will do it but not the SE part.
But although both outputs of the bridge (V(n021) and V(n022)) show lots of second harmonic distortion,

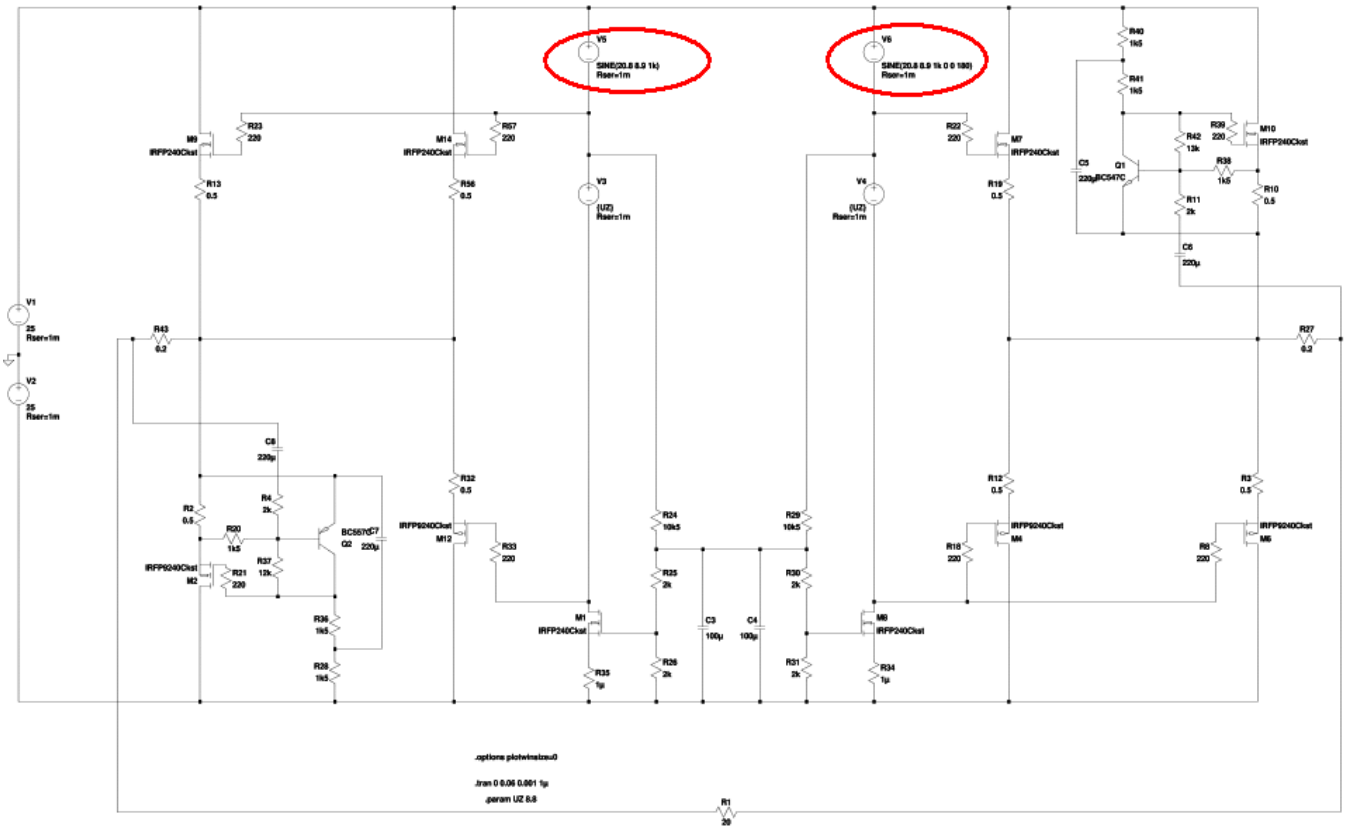


there is nearly none left in the differential output signal, e.g. the load current (see I(R1) in the picture above).

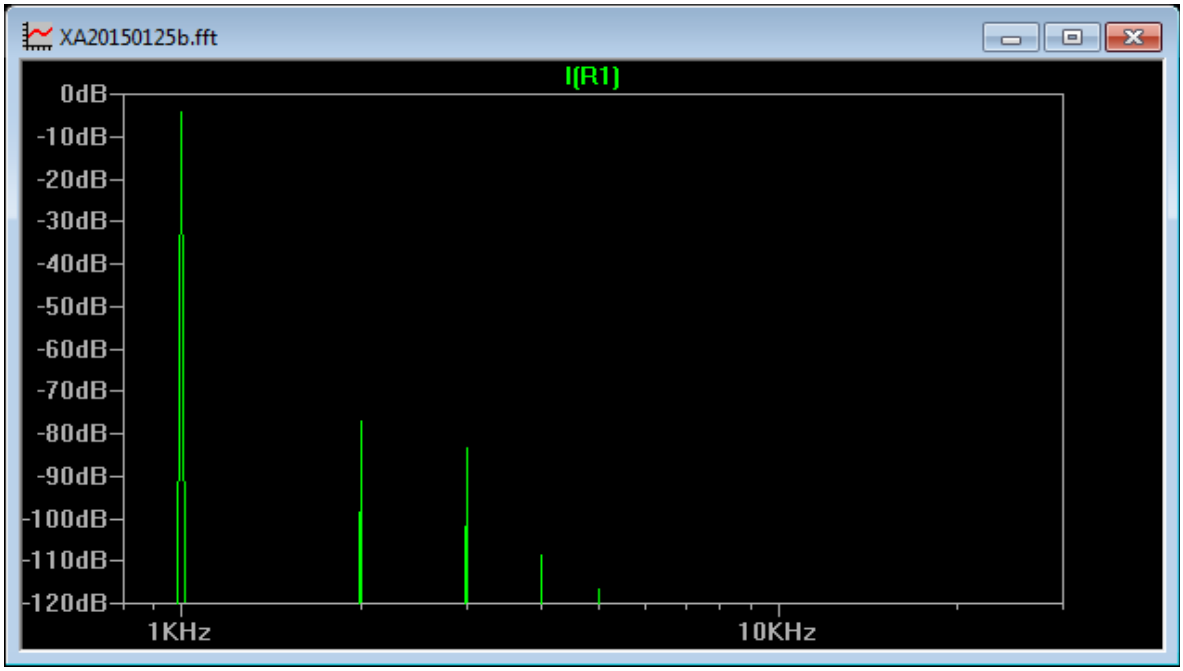
On the other hand, the driver stage is a differential stage of type 1 and that works very well for canceling second order harmonics.

Guess:
So that would mean that the driver stage will dominate the distortion spectrum and that we see it's footprint. In addition the BaPPSEHOS will create second harmonic distortion.

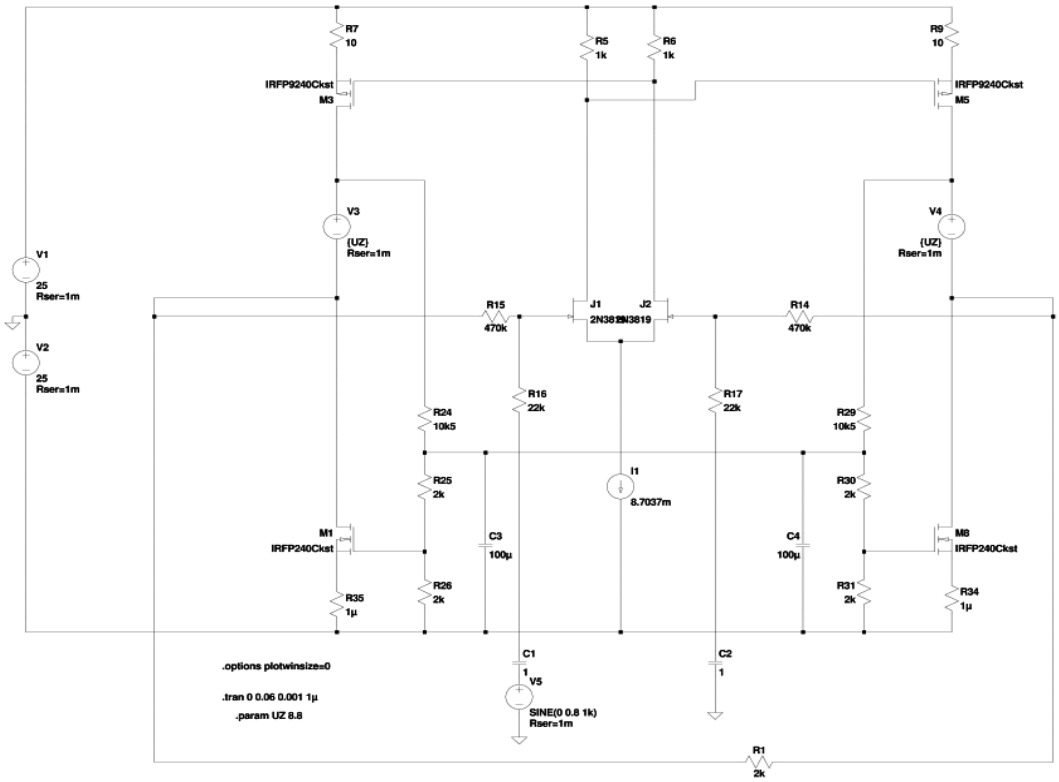
To prove that, I replaced the driver with two voltage sources that generate signals of the the same size so that the amplifier delivers the same output power. The circuitry is stored in file XA20150125b.asc. The voltage sources are marked in red.



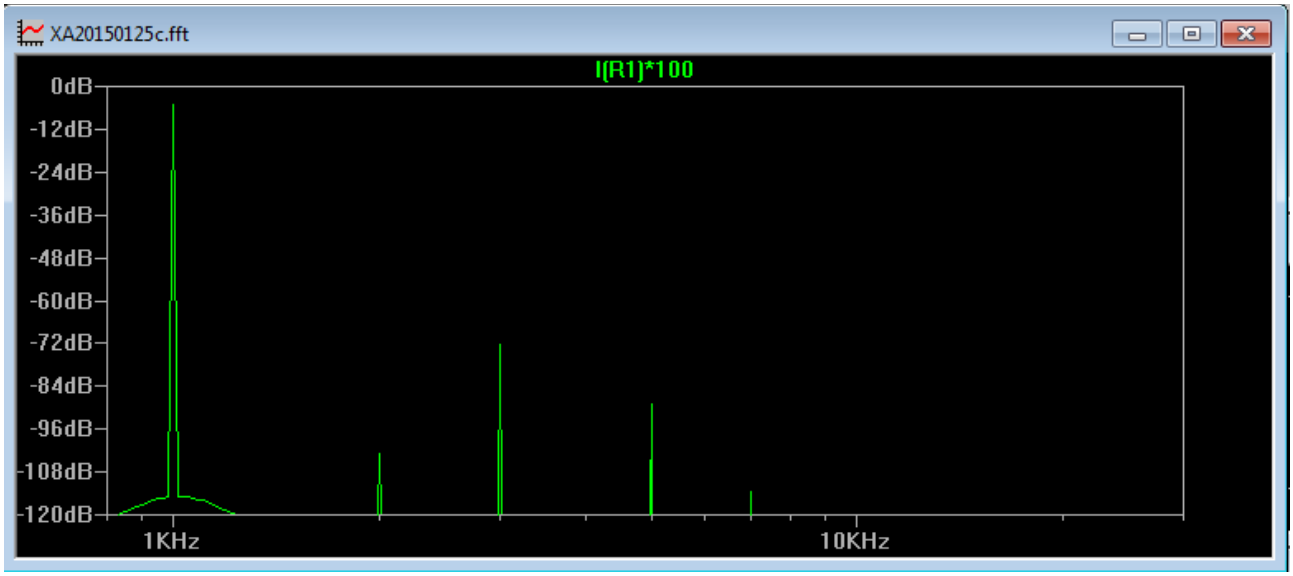
Et voila, the distortion spectrum contains the second harmonic as expected.



Now I deleted the push pull output stage and connected a small load resistor (2k) directly to the outputs of the driver stages to see the behavior of the driver stage (and the input stage), file XA20150125C.asc.

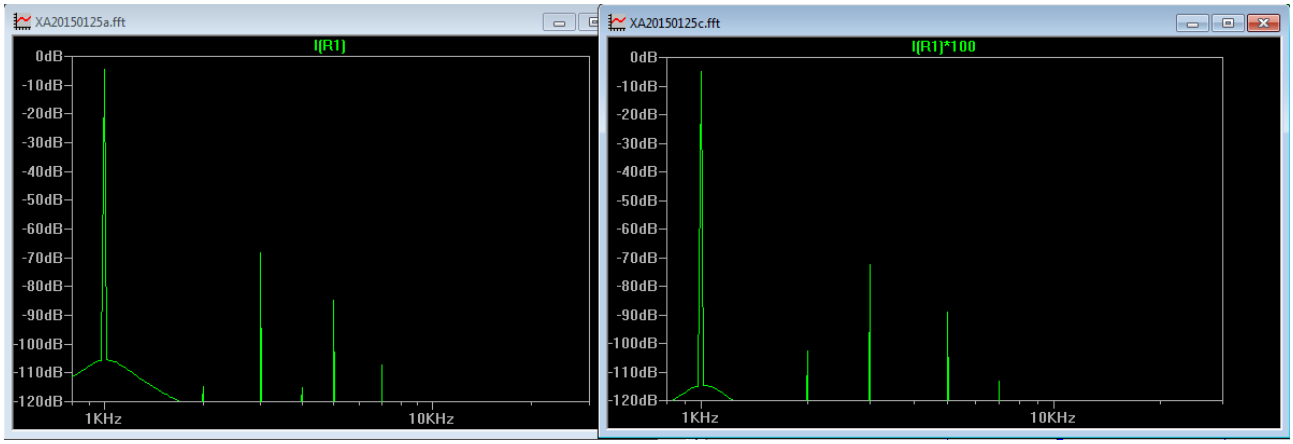


The distortion pattern shows nearly no second harmonic but resembles that one of the complete amplifier!



The factor *100 is necessary to lift the small signal through the 2k resistor to the same scale as the values in the other graphs.

And as a side by side comparison:



So the problem of the unintentional cancellation was not created by the BaPPSEHOS but by the driver and input stage.

Thus the next steps for me would be

1. Use the BaPPSEHOS with voltage source as input signals instead of the driver stage and optimize the amount of push pull, single ended and current source transistors for a given load, desired output power and distortion pattern (lots of k2, k3 as small as possible and no k4,k5,...)
2. Tune the driver and input stage (without the BaPPSEHOS) for the desired distortion pattern (lots of k2, k3 as small as possible and no k4,k5,... - exactly the same as for the BaPPSEHOS thus they fit best together: if k2 or k3 of one stage fluctuate over output signal the tonal signature is nearly unchanged as long as k2 > k3 and k4=k5=...=0)
3. Put BaPPSEHOS and driver and input stage together and check the resultant distortion spectrum
4. Check how to install possibilities for tuning in the built amplifier for fine tuning during listening. As far as I remember Nelson said that there are tonal differences even between transistors of the same type. So even if we would know the optimum settings before building the amplifier it is a good idea to prepare the amplifier for some tuning.