How to correctly run an opamp buffer in class A*
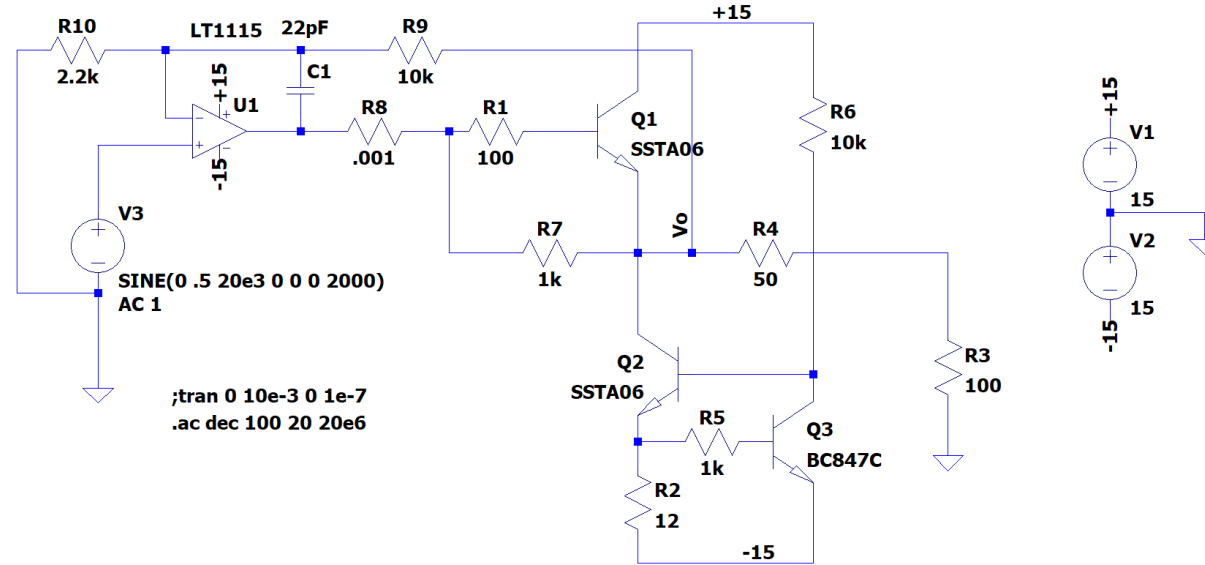

R7 in the schematic above uses the Vbe voltage of Q1 to bootstrap the output of the LT1115 opamp into class A. In this example, the class A bias current coming out of the opamp is about -1mA and is more or less constant with loads down to 32 Ohms - a typical headphone load at peak outputs of 3V. Into 600 Ohms, the output will swing 20 V pk to pk in class A. The value of C1 will depend on the opamp you use and the closed loop gain but will typically lie between 15pF and 100 pF. R4 isolates the amplifiers output from any capacitive loads. You can decrease this to 1-2 Ohms, but will need to test it with worst case capacitive loads – and compensate the amp accordingly with C1. Note, you should only use this circuit with unity gain stable devices like the LM4562, OPA1641 etc. The waveforms are shown on the next page.

* From an idea by diyaudio.com member 'jcx'
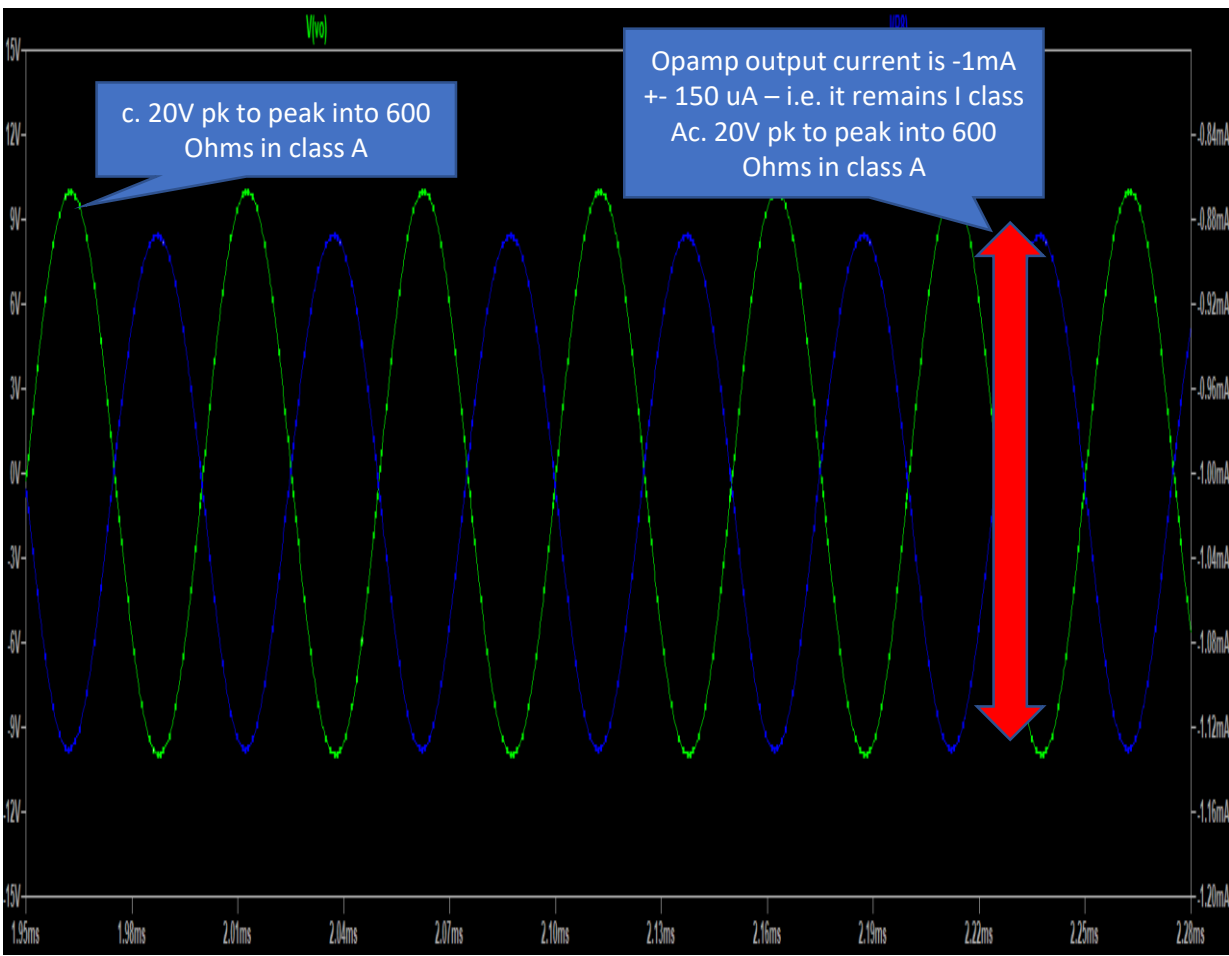
Here the circuit is driving a 600 Ohms load. The opamp output current is around -1mA +- 150 uA and thus biased into class A.
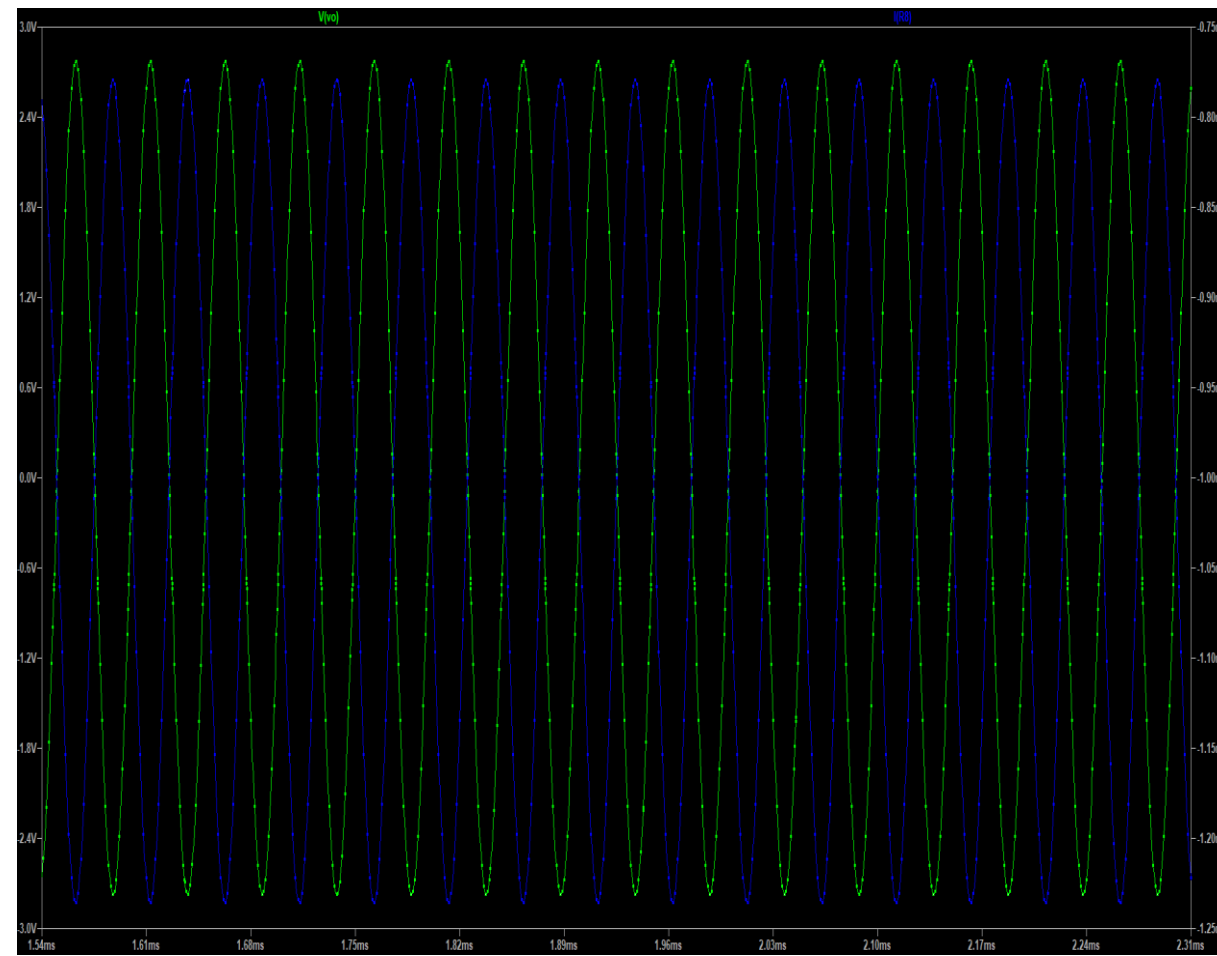
Here the buffer is driving 32 Ohms at 6V pk to pk in class A. For higher output drive currents, the value of R2 would need to be adjusted accordingly. For the 12 Ohms shown, the output stage standing current is around 50mA.