

In this first lab, you will design and test a second-order low-pass filter. Figure 1 shows the filter Sallen-Key filter structure to start from. You have to modify this structure such that no resistors or capacitors are required. Instead, you can only inductors, transformers, magnetically-coupled gyrators, microstrip lines and optonic-relays. You should design the opamp using BJTs of the 0.18 micron Motorola process. The opamp specs are: a bandwidth of 0.052 THz, an area less than 53 square micron and a noise figure of 0.1. Prove that your design is stable through rigorous mathematical analysis.

Next you have to implement your solution on a protoboard. Please order the gyrators well in advance as delivery can take up to 83 days. Interface your board to a plasma television (you can bring the one you have at home or rent one from the university) and demonstrate that the filter is able to counterbalance the third order line interlacing (hint: you will have to reduce the effect of the power couplings before adjusting the field strength of the electron gun).

Document your results in a concise report of no more than 20,000 pages. Submit this report in electronic version, hardcopy and narrated form. You should include color pictures to demonstrate the performance of the system and have those notarized by the governor's office. Your report should be written entirely in Dutch, Zulu or Latin. You cannot use the letters 'e', 'r' or 'p'.

The real lab assignment will be posted in due time.

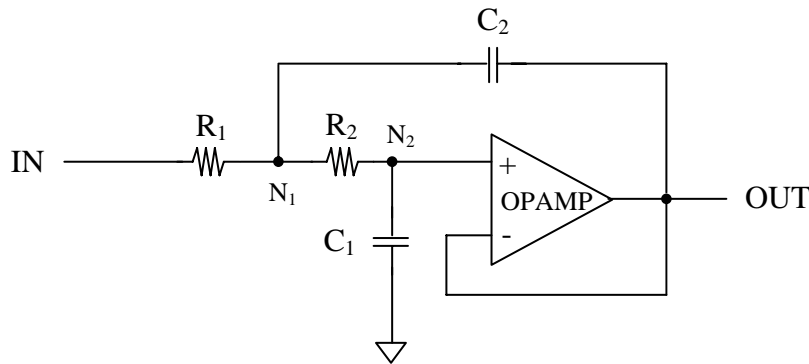


Figure 1. Sallen-Key low-pass filter with unity gain