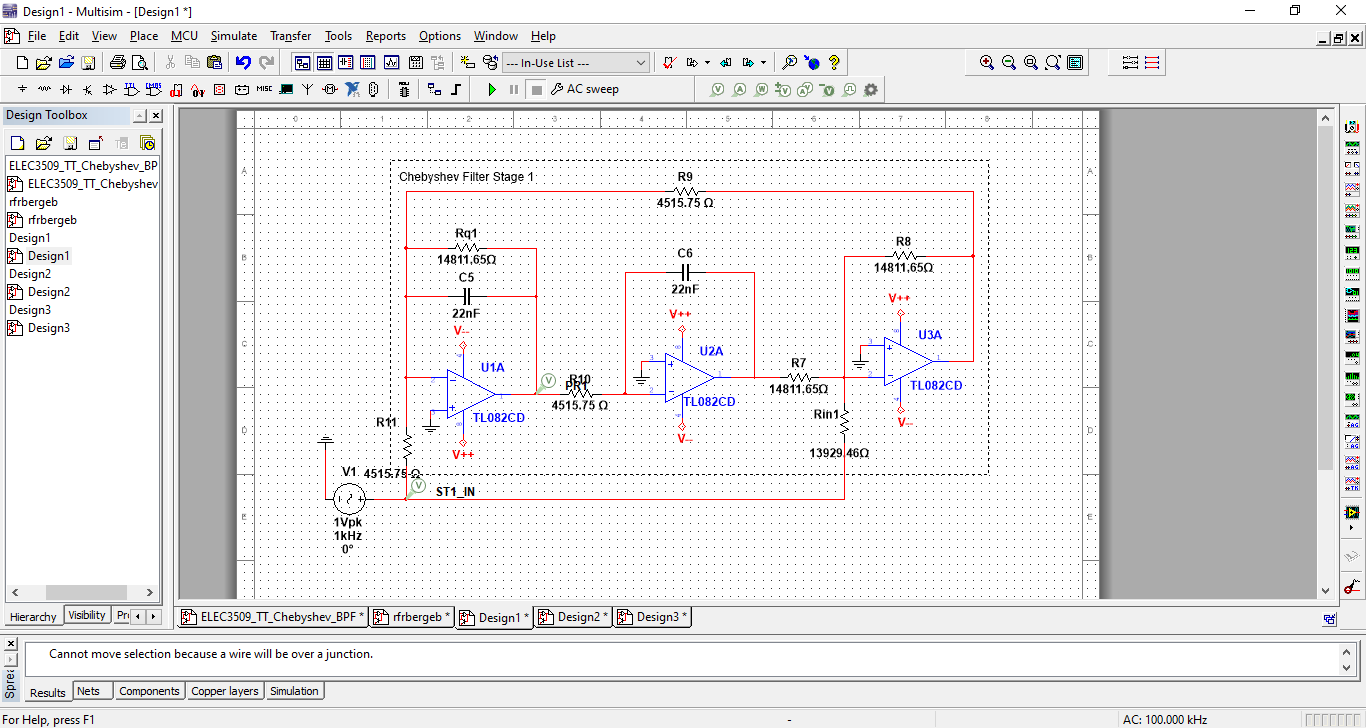
**LAB 4 CHECKOUT: ACTIVE BANDPASS FILTER PROJECT**

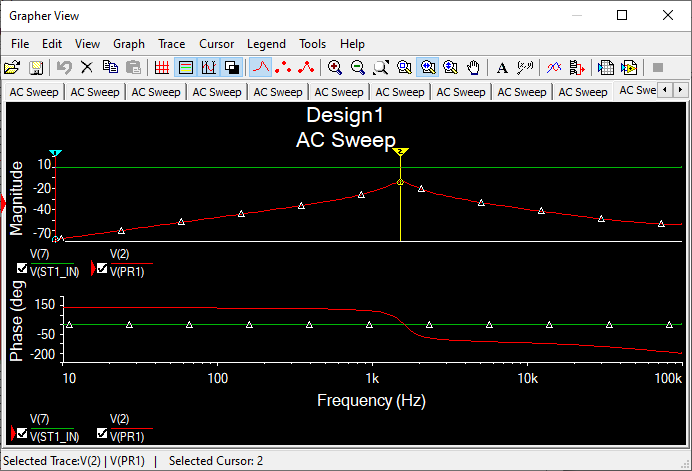
**ELEC 3509A - L6**

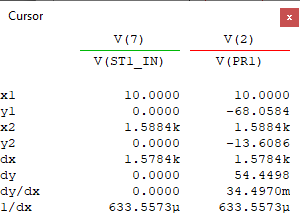
**Name:** Youssef Ibrahim

**Student #:** 101103080

* **Lower Cut-off Frequency**
* **Upper Cut-off Frequency**
* **First Stage** 
  + **Simulation using Theoritical Values**

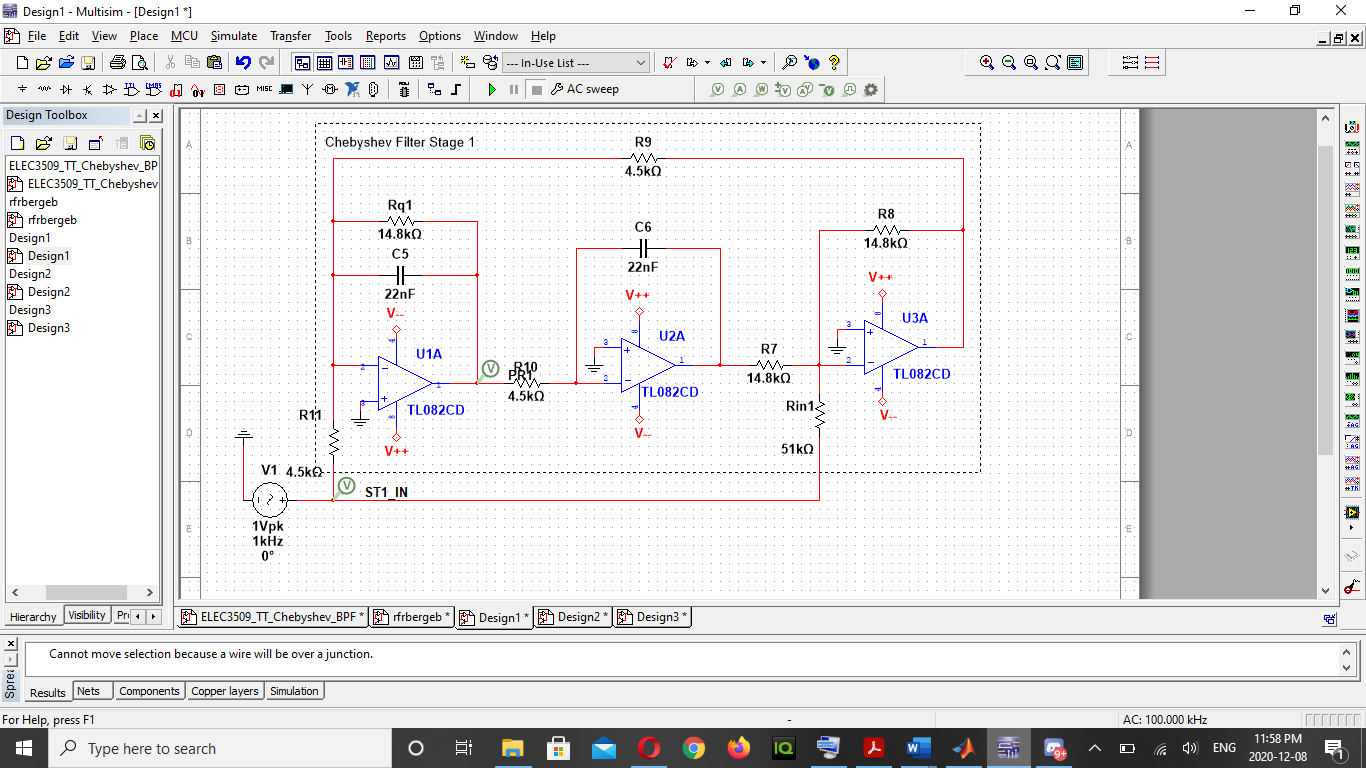


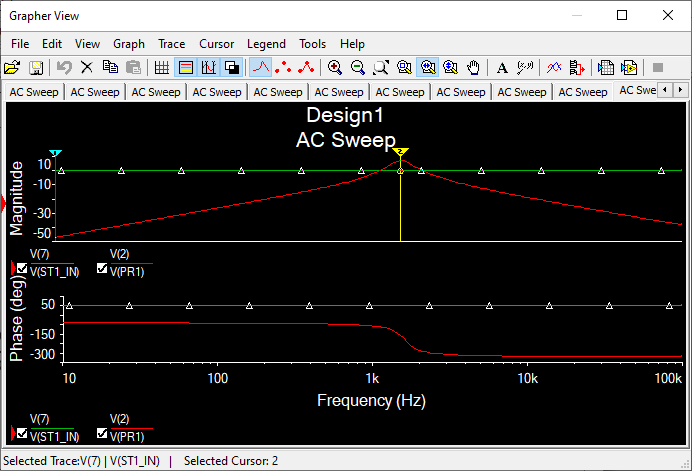


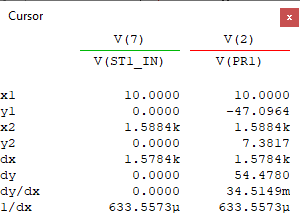


Center frequency is at 1588.4 Hz (9980.2rad/s), and Gain is -13.6086 dB.

* + **Simulation using Standard Values**

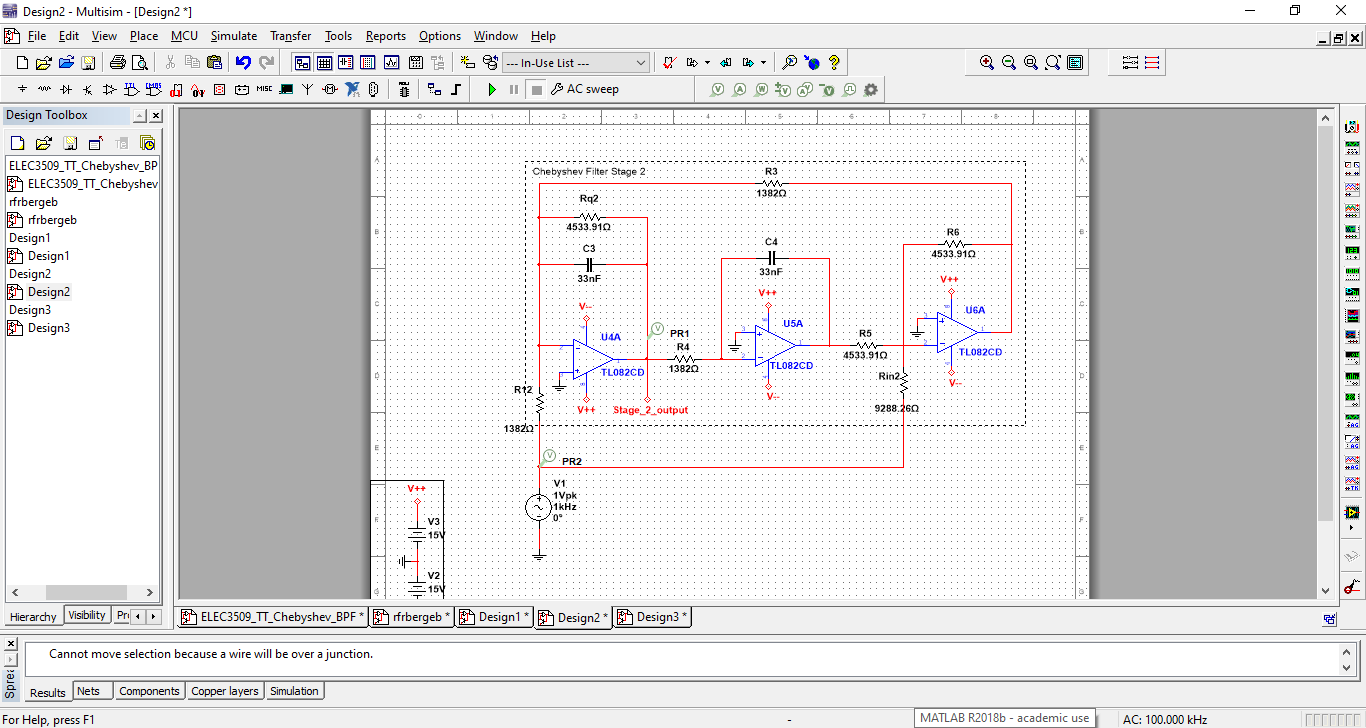


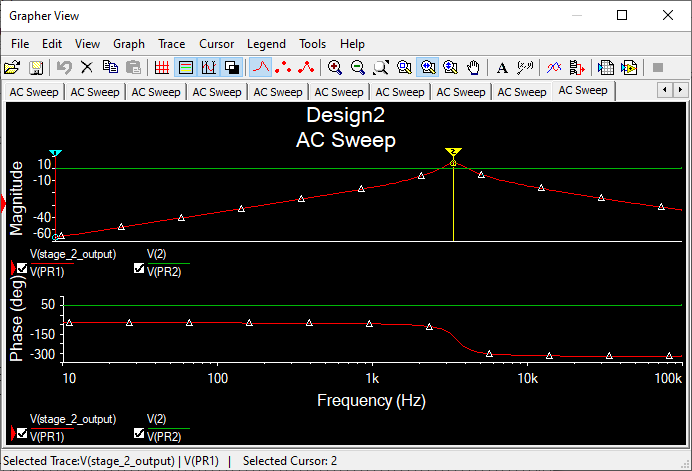


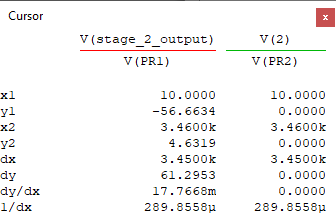


Center frequency is at 1588.4 Hz (9980.2 rad/s), and Gain is 7.3817 dB.

* **Second Stage** 
  + **Simulation using Theoritical Values**

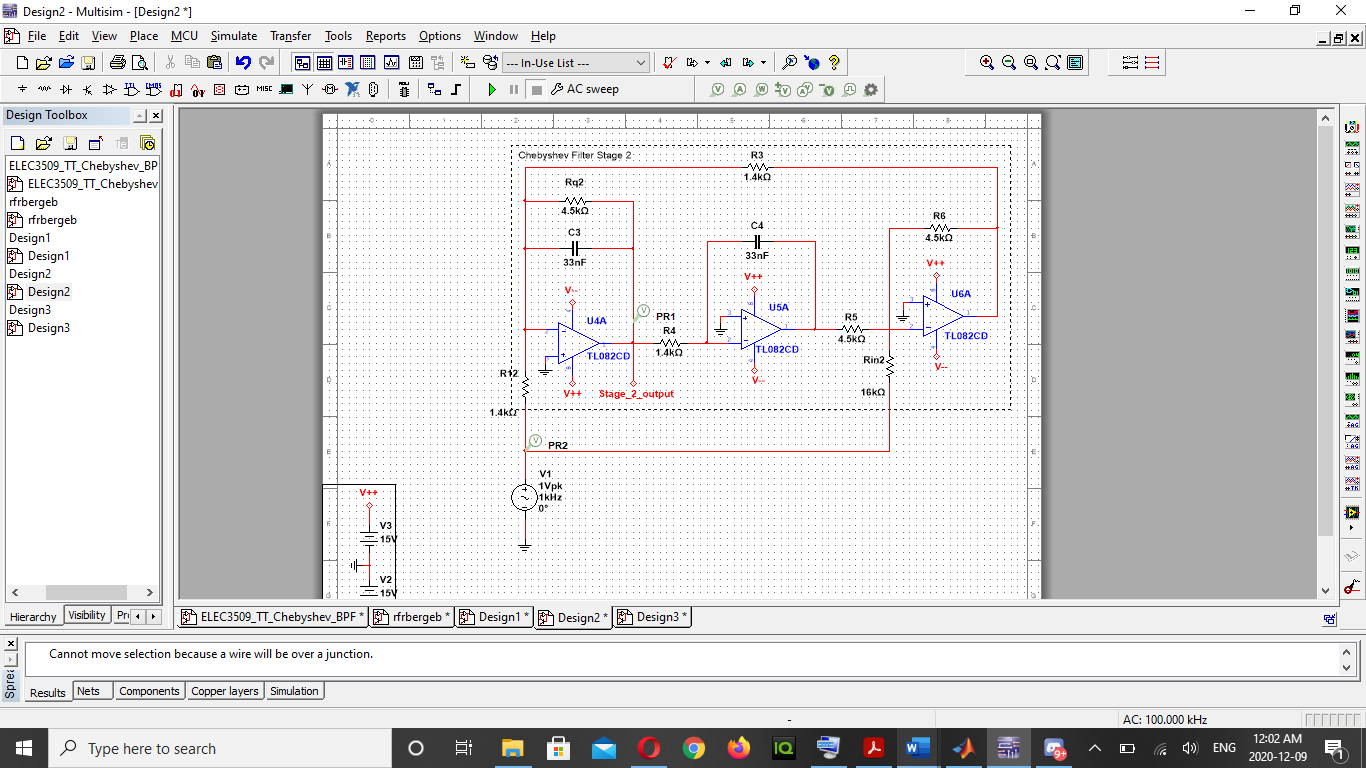


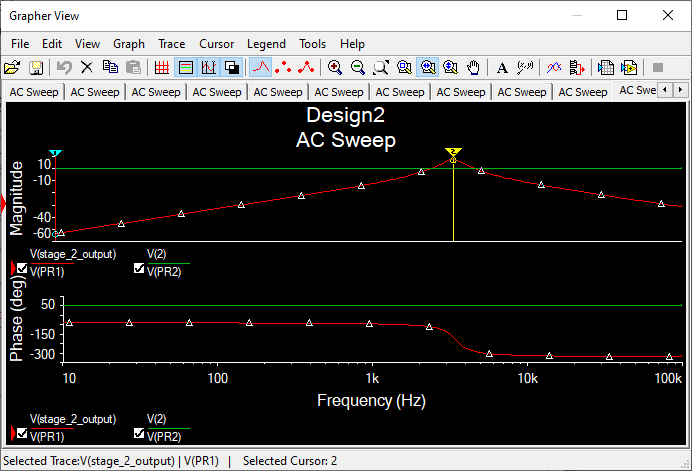


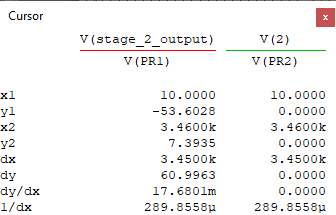


Center frequency is at 3460 Hz (21739.8 rad/s), and Gain is 4.6319 dB.

* + **Simulation using Standard Values**

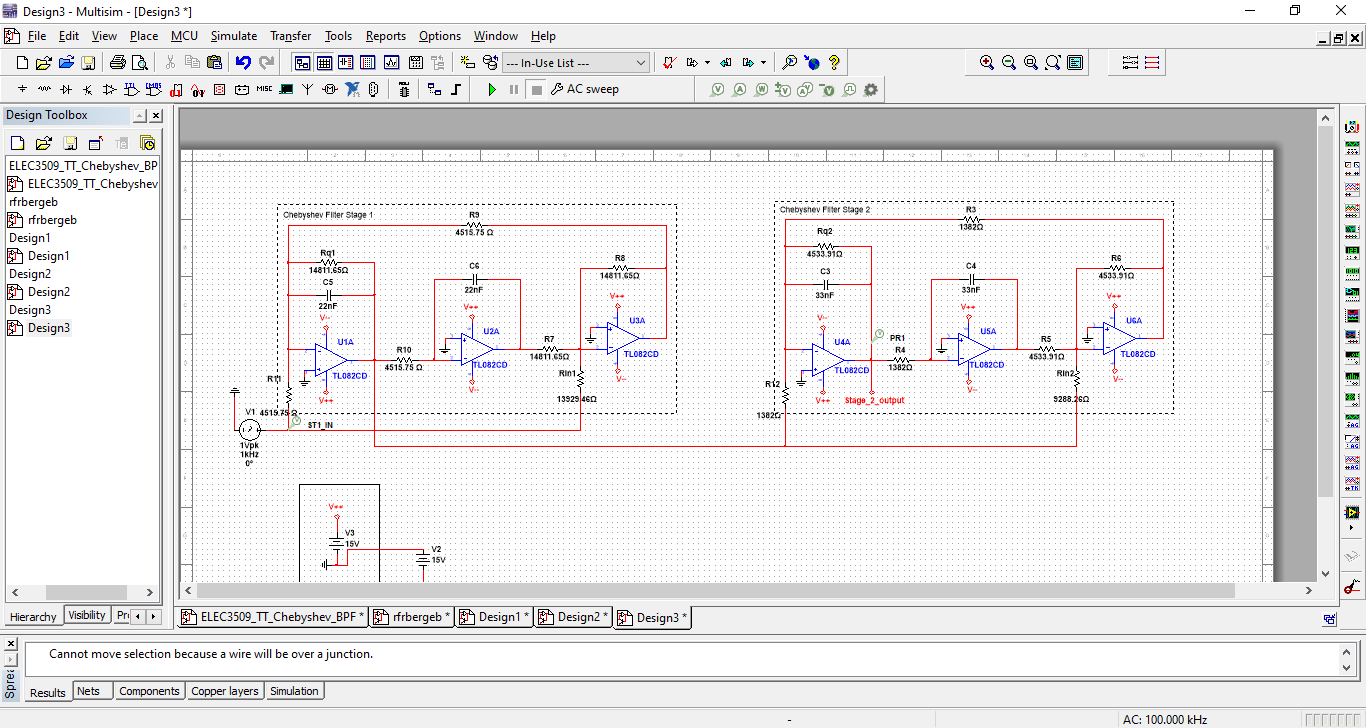


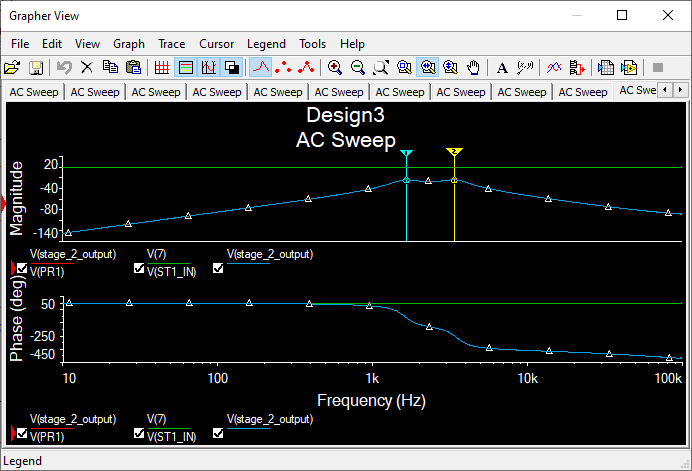


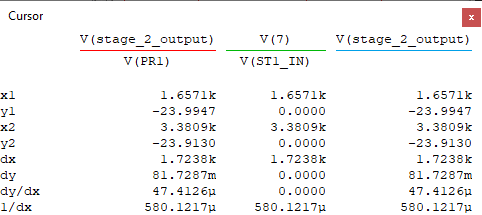


Center frequency is at 3460 Hz (21739.8 rad/s), and Gain is 7.3935 dB.

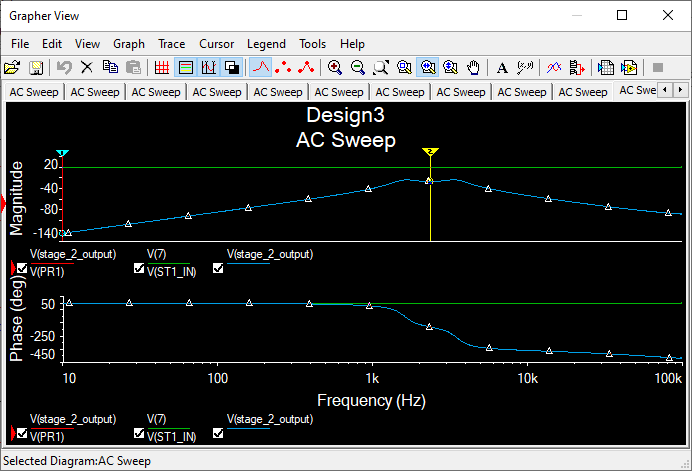
* **Full Chebyshev Filter** 
  + **Simulation using Theoritical Values**

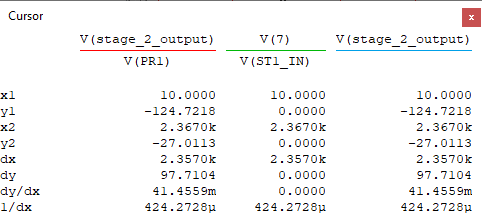






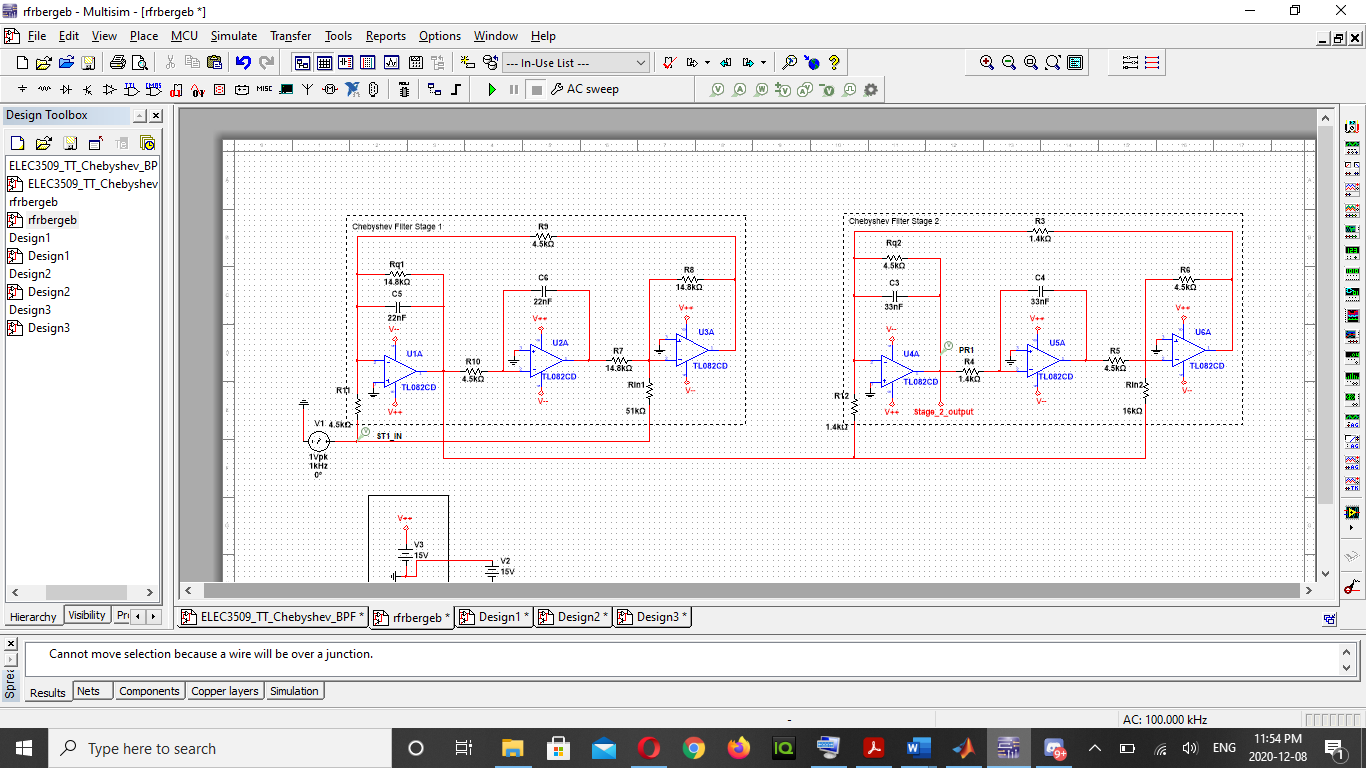
The Full Chebyshev filter has a lower -3db frequency equals to 1657.1 Hz (10411.8 rad/s), and upper -3dB frequency equals to 3380.9 Hz (21242.8 rad/s).

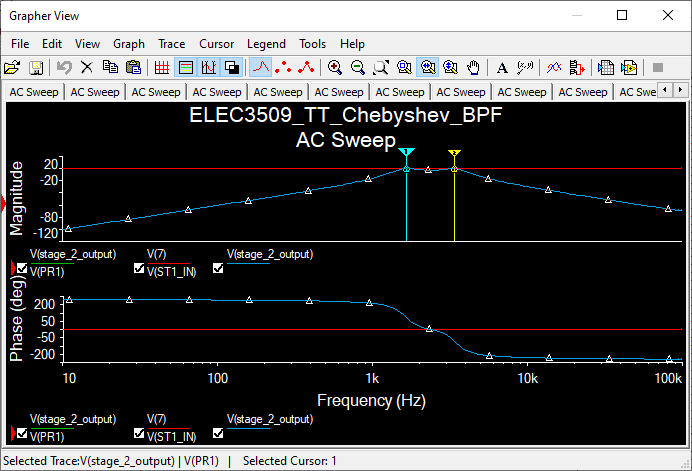


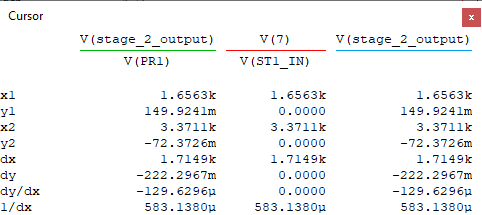


The Full Chebyshev filter has a gain of -27.0113 dB and center frequency equal to 2367 Hz (14872.3).

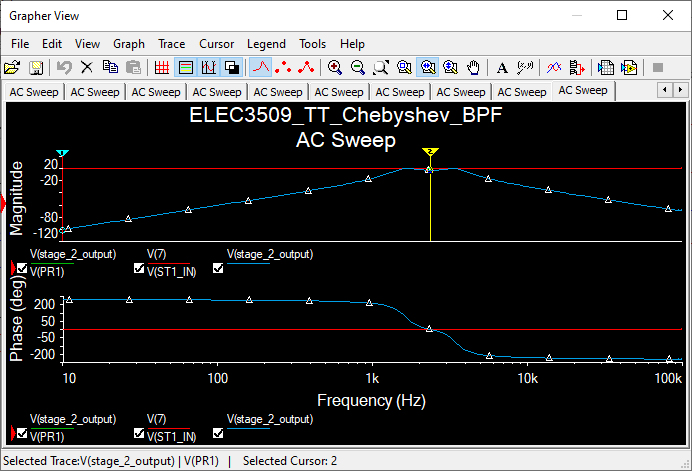
* + **Simulation using Standard Values**

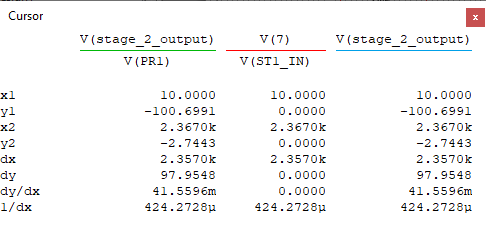






The Full Chebyshev filter has a lower -3db frequency equals to 1656.3 Hz (10406.8 rad/s), and upper -3dB frequency equals to 3371.1 Hz (21181.2 rad/s).





The Full Chebyshev filter has a gain of -2.7443 dB and center frequency equal to 2367 Hz (14872.3 rad/s).

The table below show the theoretical and standard values for the different resistors used in the simulation.