
EE/CprE/SE 491 WEEKLY REPORT 7

24/10/24 - 31/10/24

sdmay25-16

Project title: Multi-Channel High-Gain Low Noise Amplifier for High-Frequency Ultrasound Signal Acquisition

Client &/Advisor: Manojit Pramanik

Team Members/Role:

Jon Wetenkamp, Yash Gaonkar, Ethan Hulinsky, Ryan Ellerbach

- **Weekly Summary:** This week we could not go to the MRC to work on the prototype so instead the team decided to see if we could use any of the simulating tools like NI-Multisim to simulate the amplifier. Since the manufacturers do not provide a spice file for the amplifier, we had to try building it using the circuit diagram they provided. This was where we started running into issues. In previous reports we have stated that one of the main problems with the circuit is that the output voltage clips at higher input voltages. These readings are obtained by running tests on the actual prototype, but when we run the simulation on the software the output voltage the clipped. This led us to have several questions for our project contact.
 - We don't know the specific value of the two resistors (not the biasing resistors) in the Darlington configuration
 - Our inductors value seems to be impacting the gain
 - Simulation doesn't show clipping at the top. The output voltage is going above 5 V
 - Our gain for each amplifier is not 10
- **Past week accomplishments** Member 1: Worked on... □ Team Member 2:
 - Yash Gaonkar: Did trouble shooting to see what biasing voltage the circuit needs.
 - Ethan Hulinsky: Tried to build the amplifier in the software.
 - Ryan Ellerbach: Ran simulations in Ni-Multisim to see if the output voltages get clipped.
 - Jon Wetenkamp: Did trouble shooting to see what biasing voltage the circuit needs.

Pending issues

- We don't know the specific value of the two resistors (not the biasing resistors) in the Darlington configuration
- Our inductors value seems to be impacting the gain

- Simulation doesn't show clipping at the top. The output voltage is going above 5 V
- Our gain for each amplifier is not 10

Past week accomplishments

○ **Individual contributions**

<u>NAME</u>	<u>Individual Contributions</u> <i>(Quick list of contributions. This should be short.)</i>	<u>Hours this week</u>	<u>HOURS cumulative</u>
Jonathan Wetenkamp	Did trouble shooting to see what could be changed if the	3	22.5
Yash Gaonkar	Did trouble shooting to see what biasing voltage the circuit needs	1	20.5
Ryan Ellerbach	Ran simulations in Ni-Multisim to see if the output voltages get clipped.	3	24.5
Ethan Hulinsky	Tried to build the amplifier in the software.	3	28

○ **Plans for the upcoming week**

We are going to reach out to Avishek to see if the simulation could be improved. Next week we are going to test different biasing voltages. We might also try different transistors to build the amplifier in the simulations.