

EE/CprE/SE 492 STATUS REPORT sdmay25-29

February 14, 2025 - February 27, 2025

Group number: 29

Project title: Implementation of the ABC using modern technology

Client &/Advisor: Professor Alexander Stoychev

Team Members/Role:

Connor Hand - Client Interaction and Team Organization

William Mayer - Meeting Time Tracking and Note-Taking

Peter Hurd / Noah Butler / Zach Scurlock - Testing and Individual Component Design

Peter Hurd - Budget Handling

Bi-Weekly Summary

This week, our meetings were centered around furthering our design based on a manual written for the ABC in 1968. This primary source gave us a deeper understanding of our goals and the control logic of the computer. We now have a better idea on how we are going to implement our control board. Also, we talked a lot about the shifter design these past two meetings. We realized we are going to need to design a buffer for the shifter due to not being able to read and write in the same cycle, as the original ABC could. We also have a much better idea of how we are going to implement the base conversion circuit using EEPROMs. We have made significant progress on our Quartus Prime simulation, Android app, and Java implementation.

Past week accomplishments

- Connor Hand: Improved functionality of base-2 punch Android implementation. Experimented with reading values from EEPROM using ESP32.
- Zach Scurlock: Finalized basic implementation of base-10 punch implementation. Created holder/shifter circuit in Intel Quartus Prime.
- Peter Hurd: Began drafting and modeling the full-scale device in Quartus Prime. Created a prototype timing and control circuit to provide important signals.
- William Mayer: Implemented binary addition and subtraction in the ModifiedGaussianProgram using BigInteger. Made the program output 'pretty' 50-bit binary numbers to show the process of addition and subtraction.
- Noah Butler: Modeled Base 10 to Base 2 converter in Intel Quartus Prime

Individual contributions

<u>NAME</u>	<u>Individual Contributions</u> (Quick list of contributions. This should be short.)	<u>Hours this week</u>	<u>HOURS cumulative</u>
Connor Hand	Improved functionality of base-2 punch Android implementation and experimented with reading values from EEPROM on ESP32	10	70
Zach Scurlock	Finalized basic implementation of base-10 punch implementation. Created holder/shifter circuit in Intel Quartus Prime.	10	66
Peter Hurd	Drafted and modeled system-wide circuits. Created prototype timing and control module	15	77
William Mayer	Improved Modified Gaussian Program	15	75
Noah Butler	Modeled Circuits in Quartus Prime	12	69

Plans for the upcoming weeks

- Connor Hand: Achieve bluetooth communication between ESP32 and Android base-2 punch implementation. Gather data from EEPROM and send to Android app.
- Zach Scurlock: Get base-10 punch implementation to communicate with ESP32 via bluetooth. Continue designing circuits in Intel Quartus Prime.
- Peter Hurd: Work on getting the entire system drafted up and simulated in Quartus. Work with ETG to order the necessary components for new circuits.
- William Mayer: Creating GUI for Java program, helping out in Quartus prime.
- Noah Butler: Continue designing circuits in Quartus Prime

Summary of weekly advisor meetings

The team will finalize the overall block diagrams—indicating exactly how buffers connect, how the buses are multiplexed, and how each module (memory drums, shifter, adder-subtractor) integrates with the 4-mode operation. This includes confirming that the address/buffer scheme works, expanding from single to 5-wide adder-subtractor designs, and ensuring the keyboard/address control logic remains consistent. Each member's deliverables should be drafted in Quartus, coordinated closely to guarantee every piece fits seamlessly into the broader system.