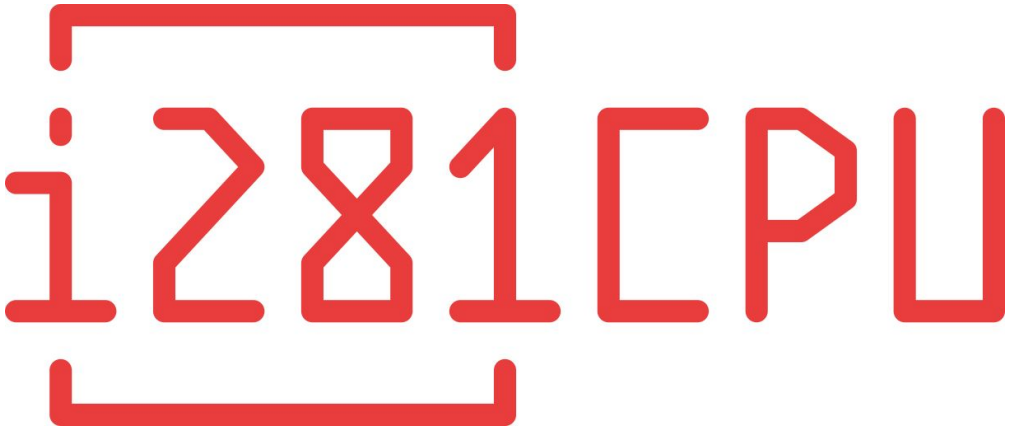


Requirements

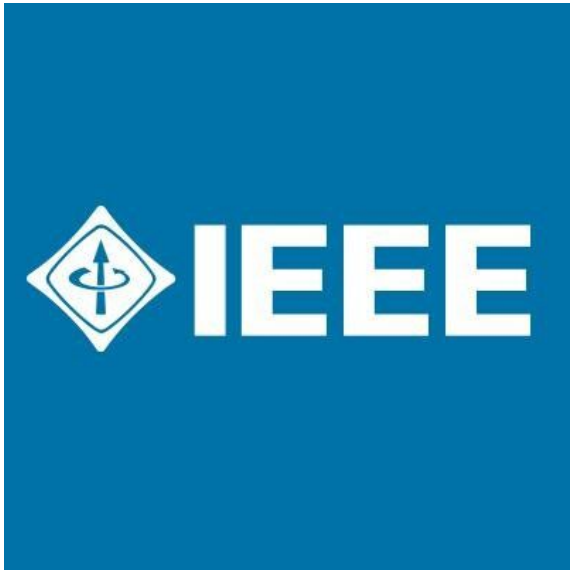
Team Members:

Daryl Damman, Logan Lee, Grant Nordling, Braxton Rokos, Gavin Tersteeg

Requirements

- The final product must look really cool.
- Bus entry and exit need to be clearly labeled with direction and connection type.
- Standardize memory components (EEPROMs and RAM).
- Memory storage must not have different sizes.
- Memory storage must be done using Big Endian
- LEDs and related visualizers must be color-coded.
- PCBs must generally detail the direction of computational logic.
- All CPU components must be labeled.
- All visualizer and logical sections of CPU components must be unambiguously identifiable.
- Singular direction (northern indicator) must be standardized and rigorously followed for all CPU components and visualizers.

Engineering Standards



IEEE 162-1963

- IEEE 162-1963 describes the standard definitions and terms for digital computers. As the project is intended to be educational, using the appropriate terminology for digital computing and related components is paramount for a comprehensive curriculum.

IEEE 370-2020

- IEEE 370-2020 describes a standard for predicting electrical characteristics on printed circuit boards and other related interconnects at frequencies up to 50 GHz. This is relevant to our project because we will need to handle signals running at up to 1 MHz on our printed circuit boards for the final product.

Requirements (Continued)

- The CPU must be fully powered through a single, easy-to-procure power source.
- Any breadboard CPU component must be hot-swappable with any PCB CPU component.
- Ribbon cables must be used across each processor component, both PCB and breadboard.
- CPU memory storage must be in Big Endian.
- The boot process must be "instantaneous" to the students.
- All CPU components must be modular.
- All chips must be DIP socketed to the breadboard and PCB.
- Electronic parts that are sourced must be available and purchasable.
- CPU execution must allow for single-instruction or continuous execution.
- CPU must allow writing custom programs via switches.
- CPU must allow loading example programs from ROM.
- Final deliverable must include a "Technician Manual" containing design philosophy, schematics, BOM, datasheets, considerations, relevant historical documents, etc., which is potentially beyond what is outlined in this design document.

Engineering Standards

IEEE 2716-2022

- IEEE 2716-2022 provides a guide for characterizing the effectiveness of printed circuit board level shielding. In our project, we will have a dozen or so PCBs all connected with discrete cables. We will need to take shielding into account, so we don't encounter noise-related problems.

IEEE 696-1983

- IEEE 696-1983 describes a computer bus architecture for 8-bit computers running at TTL logic levels. Knowledge of how to avoid signal noise, arbitrate device access, and distribute power to all subsystems will come into use for our own project.

Thank you

Questions?