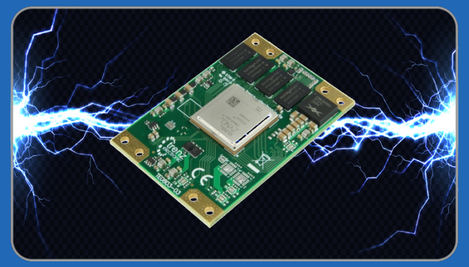


MEMZAP

The Problem

At high altitudes, high energy particles can strike memory components causing bad effects called Single Event Effects (SEEs)

The Solution

A CCA and which will be placed in a high energy proton beam and a set of software which runs in a linux environment.

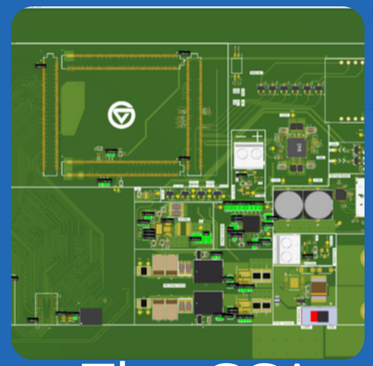
The Requirements

Create a Circuit Card Assembly (CCA) and Software which can detect SEEs and monitor the memory

GE Aviation

Faculty Advisor
Professor Scott Zuidema

Sponsor Contact
Paul Bakker
Jon Diekema



The CCA

The CCA

Designed with reverse polarity protection, a digital power regulator, a DDR4 interface, a NAND interface, and several SPI interfaces, all on a 6 layer PCB

Grand Valley State University

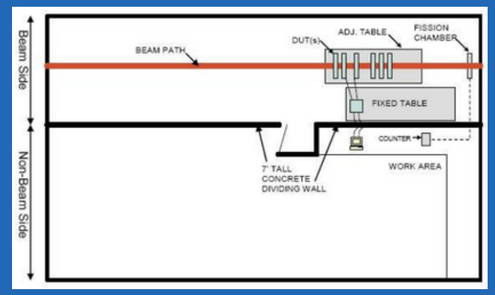
Team Members

Charlie Dorn
Abi Hendrick
Zakkaria Hales
Nicholas Berens
Nicholas Bernhardt

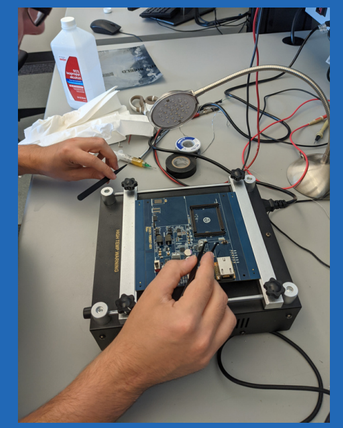
The Software

Comprised of a command line user interface written in C++ which communicates over a TCP to SPI chip to the embedded side which was written in C and VHDL

Board



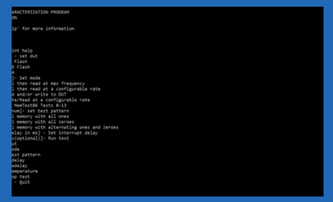
Testing Environment



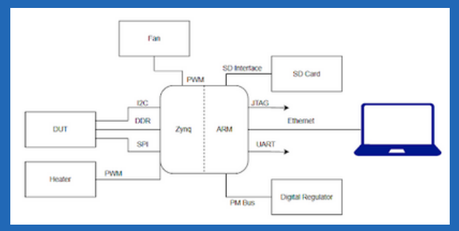
Soldering

The Assembly

Assembly of the board includied soldering 0201 resistors using a soldering oven as well as some hand soldering. BGAs and major components were also placed by hand., testing along the way.



Command Line Interface



Software