**ECEN 403 | Subsystem Demos**

**Team 42 - Multi-Axis Cobot for Factory Automation**

**Team Members: Emily Hamsa, Adrian Guzman, Ethan Woods, Jaishil Shah**

**Emily: Power Subsystem**

The goal of this board is to step down the input voltage to various voltage levels that will be used throughout the cobot using power converters. When a 48-volt power supply is connected to the input terminal blocks, show that the output terminal blocks are reading the expected voltages.

For the demo, given a 48-volt input, show that the PCB can output:

* 3.3 volts
* 5 volts
* 6 volts
* 12 volts
* 24 volts
* 48 volts

**Adrian: MCU Subsystem**

The goal is to show that the board is successfully powered and the GPIO pins from the MCU can generate signals using the Pulse Width Modulation (PWM). Control of PWM signals will be demonstrated by blinking an LED as well and spinning a small motor with written software.

For the Demo on PCB:

- 3v3 Power LED turns on after power supply connection

- Generate signal to GPIO pin to blink LED

- Generate signal to GPIO (PWM) to spin motor

- Showcase written software

**Ethan: Motor Driver Subsystem**

Show that the motor driver board can output one phase with connection to C2000 EVM.

Additionally, output phases on other two boards and be able to spin a motor with it.

Ultimate goal, if all goes well, to spin a 3 Phase BLDC Motor with the C2000 EVM.

Goals with the C2000 EVM Connected to Main Board:

* Generate Phase Signal and Voltage Step downs on Main (Phase A) Board.
* Generate Phase Signal with Voltage Inputs on Secondary (Phase B & C) Boards
* With all Three Phases, spin 3-Phase BLDC Motor connected to Main Board.

**Jaishil: Mobile Application Subsystem**

Display completed mobile application with fully functional Bluetooth connectivity and successful communication with the ESP-32.

*Relevant Components:*

* Mobile Application on iOS device
* Arduino IDE code
* ESP-32 designed on Altium
* Pre-purchased ESP-32 that connects to an OLED screen.

The Altium-designed ESP-32 board will receive inputs from the mobile device, and the pre-built board will display them on an OLED screen to demonstrate more complex useability.