***Self-Balancing HLD***

***Overview***

This PCB should be the main connector device between all electronics on the self-balancing robot.

* ESP32 mounted to female header pins
* IMU data in
* USB connectivity between ESP32 and Rock Pi 4b
* Molex PWM output pins for motor driver board

***Power***

* 12V input from li-ion battery via XT60 connector
* 5V rail from regulator circuitry
* 3V3 rail from ESP32
* Rock Pi 4b powered via USB-C to USB-C from 5V
* ESP32 powered via USB-A to USB-C from Rock Pi 4b

***IMU***

* MPU-9250 GY-9250 as the IMU
* IMU input to PCB via molex 6 pin connector tied to ESP32 I2C pins
* Powered via 3V3 rail

***Motor PWM***

* Molex 5 pin output connector tied to ESP32 pins

***Motor Inputs from motors***

* Molex double row 12 pin motor input connector
* POS and NEG lines of each motor
* 5V, GND, and two encoder lines per motor

***Motor Driver Inputs to PCB***

* Motor POS and NEG lines will run through a molex 4 pin output connector