Delay Call
(Invoked Throughout Codebase)
Filter Background Tasks by Duration & Time Remaining
Sort Background Tasks by Priority
Execute Background Task
Exit When Desired Time Elapsed
Asynchronous
IMU SPI ISR
~1.0 kHz
Read SPI Data
Parse Packet
Update Corresponding Values
Feed Watchdog
Encoder Rising Edge ISR (x2)
Record Timestamp
Read B Channel
Increment/Decrement Counter
Current Sensor ADC ISR (x2)
~9.6 kHz
Calculate Battery Voltage
Scale Motor D.C. to Compensate
Calculate Drive Motor Current
Scale Drive Motor D.C. to Limit
Update Motor Outputs
Feed Watchdog
Calculate Reaction Motor Current
P-Control Reaction Motor D.C. to Target
LCD Refresh Background Task
Check If Refresh Period Elapsed
250 ms
Flush Draw Buffer
Record Timestamp
CLI Flush Background Task
Flush Log Buffer
Read Input Buffer
Parse Command
Update Corresponding Values
Loop
~1.0 kHz
Copy Volatile Sensor Data
Calculate Control Outputs
(Currently just P-Control)
Update Motor Outputs
Delay
Feed Watchdog
Initialization
CLI
Configure USB Serial
Launch Flush Background Task
LCD
Configure Serial
Configure LCD
Launch Refresh Background Task
Motor (x2)
Configure PWM Timer
Boot
Current Sensor (x2)
Configure ADC
Register ADC ISR
Encoder (x2)
Register Rising Edge ISR
IMU
Reset
Configure IMU Sensor Fusion
Calibrate
Register SPI ISR