

Foam Rocket Turret Project Proposal

Main Goal:

The main goal of this project is to develop a twin axis foam missile turret with a directional control pad and feedback LCD display for accurate aiming and firing.

Functionality:

Attitude Control

- Interface bipolar stepper motors driver(s) to MSP430 for pitch and yaw orientation of turret
- utilize buffer to save pin use on MSP and limit control to one axis of motion at a time

Fire Control

- incorporate off the shelf NERF style spring actuated dart gun
- interface solenoid for trigger actuation
- incorporate proximity sensor to determine if the turret is loaded
- display readiness to fire with red/green led

User Input

- 4 button directional pad for positive and negative changes to the angle of pitch and yaw
- Single trigger button for activation of turret. Only accessible when the fire state is considered "ready"

Display

- LCD display will show current firing angle and readiness to fire in real time to user

Hardware Components:

LCD Display

Bipolar stepper motor drivers (2)

Bipolar stepper motors

proximity sensor

solenoid

LEDs (2)

Pushbutton Switches (5)

Power Supply (~9v battery)

DC/DC Buck Converter

Features of MSP430:

Timer for PWM signal

I/O pins for LCD

I/O pins for Switch interfacing

interrupt features for user input

I/O Pins for motor control
low power mode when waiting for input

Work Distribution:

- Maria: LCD display interface with MSP430
- Katayoun: User input to MSP430 and power distribution
- Muhammad: Fire Control integration with MSP430 and dart gun
- Ed: Stepper motor interface to MSP430 through driver boards and data buffer

Block Diagram

