

EE 2920 – Final Project: Drone Control

Must be completed by the end of week 10's lab period

Name: _____

Objectives

- Pull together concepts from the term
- Interface to a servo motor
- Interface to a TV remote control

Prelab

- Review servo motor operation
- Review IR transmitter

student
check off

Assignment

- Part 1:
- a) Simulate a pilot's pedal with a 0-3.3V DC voltage divider signal using a potentiometer
 - b) Sample the pedal with the ADC at a 100Hz rate
 - c) Display the ADC code and voltage on the first line of the LCD
 - d) Use a timer/counter to create a 50 Hz pwm signal to control a servo motor (available at the Tech Center) driving the rudder of the drone
 - e) Servo motor rotation should be mapped linearly to the potentiometer setting.
0V → -45 deg, 1.65V → 0 deg, 3.3V → +45 deg
 - f) Display the rudder position -45 deg to + 45 deg on the second line of the LCD

- Part 2:
- a) Develop an IR receiver application to decode the signal from an IR transmitter (remote control - available from tech support) using the MSP432 input capture system
 - b) Display the 12 bit data word on line 1 of the LCD display
 - c) Display the appropriate button value on line 2 of the display
vol up, vol dn, ch up, ch dn, 0-9, all others – "err"
 - d) Use the decoded IR signal to control the rudder servo motor from the Part 1.
ch up → +45 deg position
ch dn → - 45 deg position
vol up → +5 deg from current position
vol dn → -5 deg from current position
0 -- 0 deg position

Check Off

You must demonstrate your working design(s) prior to the end of the week 10 lab period

- Demo your Part 1 50% _____
- Demo your Part 2 30% _____

Lab Report (informal)

- Due at 4:00 pm, 1 day after the week 10 lab period – in the box outside my office
ABSOLUTELY NO LATE SUBMISSIONS
- Include this cover sheet
- Include a properly documented informal lab report. 20% _____