E-Racer

Week 9 (3/26/08 – 4/2/08)
April 2, 2008
Kevin Arpin

**Work Completed**

This past week I focused on the last remaining bug in the acceleration code and the steering system. After debugging with Dave Price, I realized that this problem with within the code. I was using a do/while loop to control the braking output if the brake button is held in the on position. The code has to be slightly modified to fix this problem. Instead I used a do loop in conjunction with an if loop to solve the problem.

Also, I have to add an output from this system to send to the controller on the kart. The as received go kart had a switch that was engaged when the brakes were pulled. I will simulate the same switch using the microprocessor. The output signal will be 0V or 5V (brake engaged) and will be sent to the karts controller.

All other bugs in this braking/acceleration program have been fixed.

The steering system has been designed and the code has been written. Below is a picture of the updated protoboard with the newly included steering pic. The right pic is the steering pic and the left pic is the braking/acceleration pic. The two potentiometers on the protoboard represent the potentiometers that will be attached to the steering wheel and the linear actuator controlling the steering system.

![Figure 1 – Protoboard](image-url)
The code written for the steering system is seen below. This differencing code is based on the assumption that the potentiometers will output 1-4V.

```c
#include <pic.h>
#include <stdlib.h>
#include <math.h>
#include "adc.h"
#include "delay.c"
#include "delay.h"

__CONFIG(DEBUGEN & WDTDIS & LVPDIS & HS);
void main(void){

    signed char diffj;
    signed char diffw;
    unsigned char wheel_position;
    unsigned char joy_position;
    unsigned char act_position;

    TRISB =1;  //port b=digital in
    TRISC = 0 ;     // set PORTC as output
    PORTC = 0 ;     // clear PORTC
    ADRESH=0;

    PR2 = 0b01111100 ;
    T2CON = 0b00000101 ;
    CCP1CON = 0b00001100 ;
    CCP2CON = 0b00111100 ;
    #define SWITCH RB3
    #define outmain RC5
    outmain=0;

    for(;;)
    {
        while (SWITCH==1)   //wheel mode
        {
            init_a2d();
            wheel_position=read_a2d(1);
            init_a2d();
            act_position=read_a2d(3);
            diffw=wheel_position-act_position;
            if (diffw>10)
            {
```
Both potentiometers will not be outputting 1-4V. The code will have to be modified to accommodate this change. Travis and Mike will be providing me with this voltage range asap and then I will update the code.

**Future Work**

1. get voltage ranges from Travis and Mike and update code
2. Test the updated code with the steering actuator.
3. Test entire control system and prepare for on kart test using 12V accessory battery.

**Hours Worked**

Time spent on the project 3/26/2008 – 4/2/2008: 12 hours