

# ECT 357 – Microcontrollers I

## Lab 9: Introduction to Embedded C Programming

**Objective.** To introduce the student to the Microchip Integrated Development Environment in a C context.

### Procedures.

1. Open the program MPLAB IDE on the desktop.
2. Start a new project by going to Project>Project Wizard. click Next.
3. Select the PIC18F452. click Next.
4. Select Microchip C18 Toolsuite and then click OK on language toolsuite page.
5. Give your project a name and specify it to go into the ECT357 directory.
6. Add the file c:\mcc18\lkr\18f452lkr to your project. This is the linker file for the device. This will finish the wizard.
7. Create a new .c file and add it to your workspace.
8. Enter in the following code to get you started.

```
#include <p18f452.h>
char temp;

void Initial(void);

void main()
{
    Initial();
    while(1)
    {
        if (PORTDbits.RD3 == 1) PORTAbits.RA3 = 1;
        else PORTAbits.RA3 = 0;
    }
}

void Initial()
{
    ADCON1 = 0b10001110;
    TRISA = 0b11100001;
    TRISB = 0b11011100;
    TRISC = 0b11010000;
    TRISD = 0b00001111;
    TRISE = 0b00000000;
    PORTA = 0b00010000;
}
```

Enter in the necessary code in main to cause the LED D6 to light when pushbutton SW3 is depressed. Also I want LED D2 to switch from on to off and vice versa every time

SW3 is depressed. Additionally I want LED's D4 and D5 to show the state of the rotary pulse generator RPG1.

8. Build your project and make a hex file by going to Project>build all. Make sure that the project build options state that the output is going to the ECT357 directory.
9. Use hyperterminal to transfer a text file (your hex file) to the development board. The settings need to be 19200 baud, No parity, 1 stop bit, Flow Control none. The line delay also needs to be 10 ms. (page 64 in text)
10. Run the code on your board and pass off your code with the instructor. Include comments for every line of your code stating what the line of code is doing in the program.

**Analysis/Conclusions.** What have you learned about programming in the C language format?

**Extra Credit.** Get all of the LED's, except for power of course, to turn on when the pushbutton is pressed and turn off when it is not.