

ELC 343 - TERM PROJECT #4

In this design project the students are to design and implement on the C Stamp BOL microcontroller evaluation board the following electronic tachometer.

Specifications:

1. This controller will be designed to measure the angular speed (RPM) of a 10 volt DC Motor.
2. The motor is mounted on a fixture that is available from the Laboratory Manager.
3. The speed of the motor has been determined to be approximately 4500 RPM.
4. You are to measure the time differential between two events and then take the reciprocal.
5. You are to perform (5) a number of times and then take an average.
6. The inputs are the outputs from the fixture.
7. The output is the speed of the Motor in RPM displayed on two seven segment LEDs. These display the most significant speed digits in RPM's.
8. Make sure you know how the optical interrupters work. This device is very sensitive and can be destroyed very easily.

You are to:

1. Write the program in Assembly language, with appropriate comments.
2. Build the program.
3. Produce a .lst file for review.
4. Download the .HEX file.
5. Debug the program very carefully; include portions of the debug in your report.
6. Demonstrate the operational program to the instructor.
7. Prepare and produce a fully documented technical report.
8. The report is to include, but not limited to the following:
 - a. Introduction.

- b. Discussion of results including development of any equations, detailed graphs and schematics, oscilloscope pictures, and any other component that you think helps you to explain what, why and how you did what you did.
 - c. The report must be understandable to another engineer or supervisor not working on this project.
 - d. A conclusion of your results and discussion of anything you found especially interesting or not expected from your work on this project.
9. This report is a team report and is due to me no later than the period of the scheduled final
10. The team must make a 20 minute technical presentation to the class the period of the scheduled final. You can use any of the presentation technologies you want. Your presentation slides must be part of the final report.

REPORT FORMAT: Free form, but it must comply with the following:

- a. One report per team
- b. Have a cover sheet with identification: Title, Class, Your Names, etc.
- c. Include all the deliverables previously mentioned.
- d. COMPLETELY word-processed
- e. Double spaced
- f. 12 pt Times New Roman font
- g. Fully justified (optional)

GRADING:

1. Your report will be graded as to clarity, spelling, grammar and organization. The basic requirements are the same as for the technical reports already completed.
2. Whether the system works according to the specifications or how well the system works and how well it was designed.

3. Adherence to standard programming techniques such as using subroutines where possible is required.
4. Your presentation will be graded by your peers, possible some invited guests and I.