ENGR1202 – Computer Engineering Assignment

Assignment 4 – Switch Input and Speaker Control

You will follow the lab exercise procedure below. Once you have run the exercise, demonstrate the working circuit and running software on the board to the lab TA and hand them the Lab Checkout sheet.

After you demonstrate the lab, write a short lab report (one page is fine). Submit ***ONE pdf document*** per group – upload it to Moodle. Make sure to include the group participant names in the document. Spelling and grammar COUNT in this graded assignment. Name the document:
ENGR1202-Assignment4-lastname1-lastname2.pdf
where lastname1 and lastname2 are the last names of the lab partners.

You can use the space in EPIC 2130/2132 for this lab work.

Materials needed:

- MSP430 board & cable (we provide)
- PC with Code Composer Studio (either you provide, or use the ones in EPIC2130)
- Breadboard and jumper wires (you provide)
- 7 special male to female jumper wires (we provide)
- Speaker (we provide)
- Slide Switch (we provided for Lab 3)
- 5 resistors (we provide)

Objective of lab

In this lab exercise you will program the MSP 430 board to play either the Star Wars Empire March, Also Sprach Zarathustra, the Super Mario song, or a tone when the four switches are set to different values. Specifically:

1. When the switches are 0x0 (binary 0000), the March will play. When the switches are 0x1 (binary 0001), the will Also Sprach Zarathustra play. When the switches are 0x2 (binary 0010), the Super Mario Song will play. It will finish before the switches are examined again.
2. When the switches are 0x3 to 0xF (binary 0011 to 1111), an audible tune will play. It will play for a very short time, after which the switches are examined again. You may not notice the break when the switches are examined.
3. Suggestion: wire the switches to Port 2, bits 0 to 3. Wire the speaker to Port1.1

Your group must show/demonstrate the final circuit and answer any questions the TA has. During the lab check-out, hand in the lab check out form (include your names on it!). Note that there is partial credit for this lab – you can earn points for getting only the onboard switch and LED to work (without the external switch and LED).

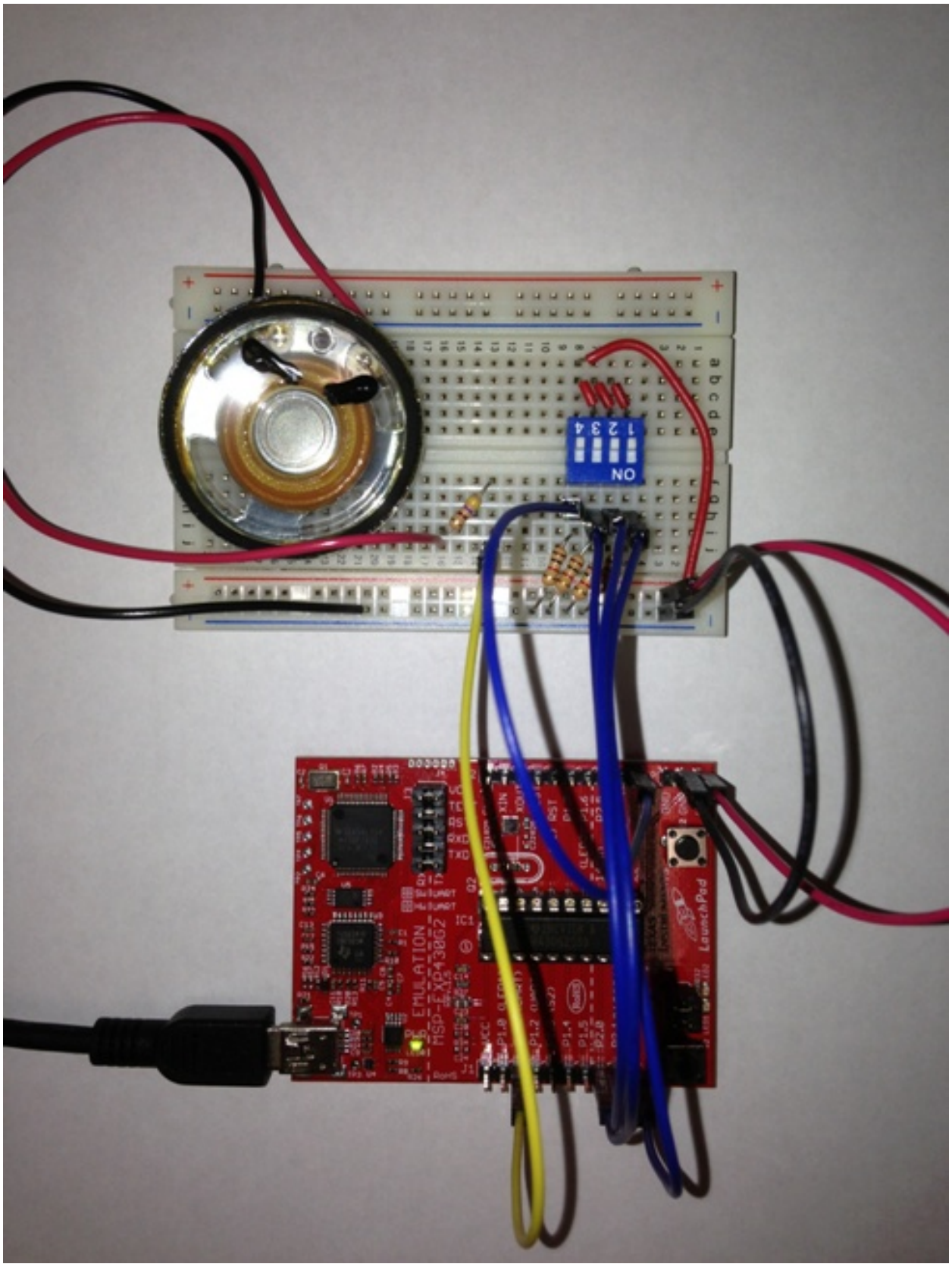
Steps

1. Design the circuit you will need to attach all 4 slide switch outputs to the board and connect the speaker to the board. Don't forget power and ground. Hint: the four switches will look like the Lab 3 slide switch interface (times four). Also, the speaker will look just like an LED (include the resistor!). INCLUDE THIS DESIGN IN YOUR REPORT!!! Include it as a scanned drawing or use Visio, but ensure it is in the report.

2. Build the circuit you designed on your breadboard, attach it to the TI MSP430 Launchpad board. An example is show in the photo below.
3. You will follow the steps to create a project as described in Lab Assignment 2.
4. Include the code provided on Moodle in the file lab4code.txt- we are not making you write the code from scratch! You will need to add/modify the code to set the direction bits of ports, read the port with the switches, and process data based on input.

Report

- One lab report and one lab checkoff sheet per group.
- Your name must be on the lab checkoff sheet in order to receive credit for lab checkoff.
- Your name must be in the report in order to receive credit for the report.
- We will not accept reports submitted past the deadline. Not even a minute late. No exceptions. Coordinate with your group to make sure someone submits it on time.
- Students will not receive credit for lab checkoffs if the TA does not personally witness them upload their code. (This forces you to bring your code so that the TA can review/reference it)
- We will require students to include their code in their reports to receive credit for submission.
- Students will lose points for report submissions that are not in PDF format or don't adhere to the following naming convention:
  ENGR1202-Assignment4-lastname1-lastname2-lastname3.pdf (where X = the assignment number)
- Code should be well commented when submitted in the report.
- Lab reports should explain, in detail, how the code/circuits work and what they do (This is separate from the comments in your code).
- Lab reports should describe any problems encountered while doing the lab. If you had no issues performing the lab, you should state that in your report.
- You will lose points for grammar and spelling mistakes in your report.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