

ELC 2137 Lab 04: Subtractor

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Summary

In this lab, it is to compare various implementations of a two-bit adder/subtractor. This is a relatively simple circuit that has sufficient complexity to highlight some important aspects of digital circuit design. After completing this lab, I can describe the operation of a two-bit adder/subtractor, and develop a moderately complex circuit on a breadboard using standard electrical parts, develop my own test procedure and verify operation of the circuit, also I may recognize that digital circuits quickly become complex and difficult to implement in hardware.

Q&A

1. Why did we use two full adders instead of a half adder and a full adder?
2. How many input combinations would it take to exhaustively test the adder/subtractor?
3. Why were the combinations given in the truth table chosen?
4. Do the results from your adder/subtractor match what you would expect from theory? Explain any discrepancies.

Results

Figure 1 is the picture of my two bit adder/subtractor circuit, I built it based on the two bit adder/subtractor schematic.

Figure 2 is the picture of my two-bit adder/subtractor schematic.

Figure 3 is the circuit demonstration page. It has the ERT and instructor signature.

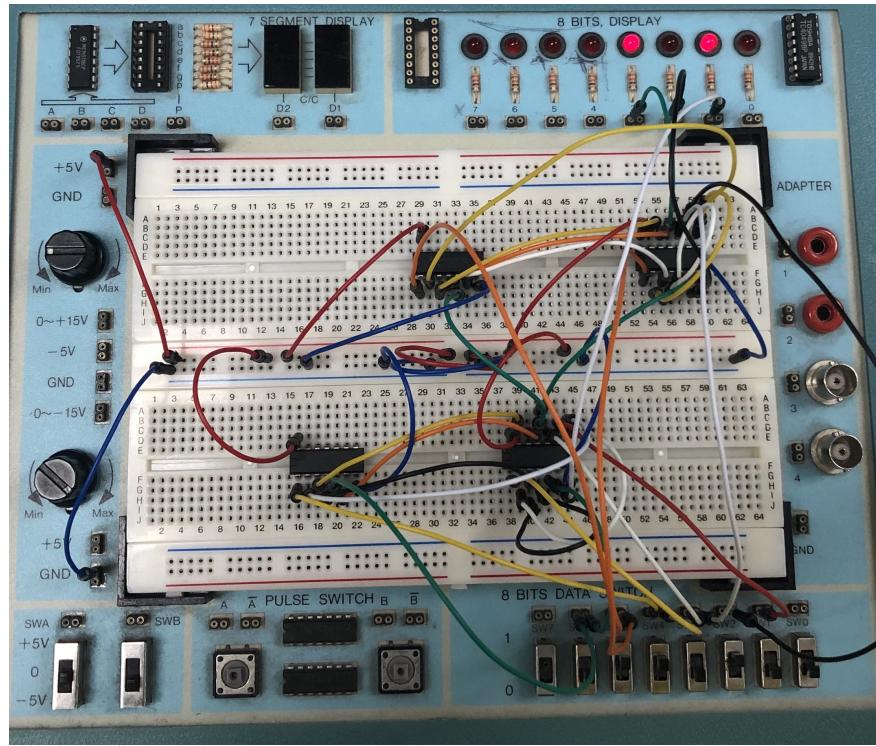


Figure 1: The two bit adder/subtractor Circuit

Code

There is no code require in this lab.

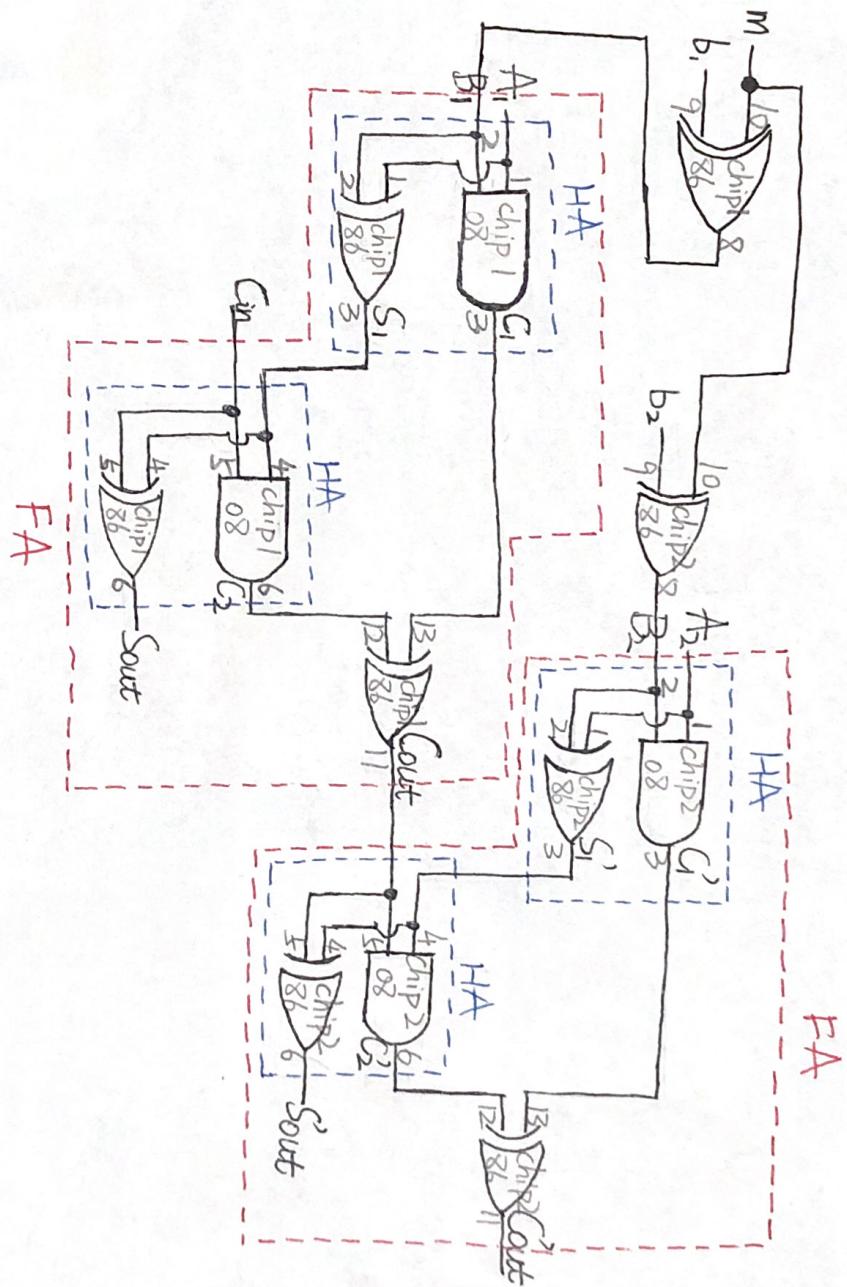


Figure 2: The two-bit adder/subtractor schematic

Circuit Demonstration Page

Student names:

Y.Ting Wang

Instructor Signatures

Separate Full Adders

Two-Bit Adder

Adder/Subtractor

AKS

Inputs		Expected Results			Actual Results	
A	B	B 2's comp	Sub	Dec	Sub	
00	01	111	111	-1	011	
00	10	110	110	-2	010	
00	11	101	101	-3	001	
01	01	111	000	0	100	
10	01	111	001	1	101	
10	00	000	010	2	110	

Figure 3: The cricuit domonstration page