CMSC 313 Lecture 23

• Today: in-class lab II
• Next time: finite state machines
#1. Set up the bread board

- Skip the literal generator.
- Use wires to connect to +5v or ground.
- Set up the power and ground to the + and - "rails".
- Use the diode to protect the chips.
- Set up two LEDs in series with 270Ω resistors.
- Place a 74LS08 chip (AND gates)
- Place a 74LS00 chip (NAND gates)
3 74LS02 Quadruple 2-Input NOR Gates

4 74LS04 Hex Inverters

5 74LS08 Quadruple 2-Input AND Gates
Handout 3: 74LS Series Logic Chips

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1 Introduction

This handout is designed to serve as a reference to the various 74LS series logic gate chips in your lab kit. It does not describe all of the chips in the kit, but covers those necessary to complete the first several labs. Detailed specs for the more advanced chips will be made available in a subsequent handout.

The illustrations provided here are intended primarily to assist you in locating gates on the chips for wiring purposes. Notice that each chip has a notch on one end, indicating the location of pin 1. The functionality of the particular gates is not discussed here. For this, please refer to your class notes or to the textbook.

2 74LS00 Quadruple 2-Input NAND Gates

![74LS00 Diagram]
#2 Make an S-R Latch

- Use the last 2 NAND gates to make an S-R latch
- Connect \( \neg S \) to ground to set the latch
- Connect \( \neg R \) to ground to reset the latch
#3 Make a Clocked S-R Latch

- Use remaining NAND gates to connect the "clock".
- Testing: connect CLK to ground, change S and R connections, disconnect CLK from ground.
- Connect S to +5v to set, connect R to +5v to reset.
#4 Make a J-K Flip Flop

- Use two AND gates to connect J, K, Q and \( \neg Q \).
- Testing: connect J to +5v to set, K to +5v to reset
- If both J & K are +5v, we get endless toggle. (When CLK is grounded, either LED might be on.)