

Digital Circuits Labs
J. Stanley Warford

This is the parts list for a set of six digital circuit labs for use in conjunction with the textbook *Computer Systems*, Fourth Edition, Jones and Bartlett Publishers. The labs and circuit designs are based on those from a UCLA undergraduate course I took in the late 1970's. I have modified the circuits and lab questions based on use with my own students over the years. Unfortunately, an exact attribution of the original labs is currently not possible, but I believe the original designs were due to Professors Bussel, Kinney, and/or Tseng.

The switch and lamp labels correspond to those of the Digital/Analog Trainer Model XK-550 manufactured by Elenco Electronics, Inc. However, it possible to use any generic breadboard kit of the instructor's choosing.

Lab 1, Basic Logic Gates

Lab 2, Combinational Logic Circuits

Lab 3, Sequential Circuits: Flip-flops and Shift Registers

Lab 4, A Combinational-Sequential System

Lab 5, Variable Modulus Decade Counter With Display

Lab 6, Arithmetic Logic Unit

Qty	Part number	Description
1	7400	Quad 2-Input NAND Gate
1	7402	Quad 2-Input NOR Gate
1	7404	Hex Inverter
1	7408	Quad 2-Input AND Gate
1	7432	Quad 2-Input OR Gate
1	7447	BCD to 7-Segment Decoder/Driver
2	7476	Dual Master-Slave J-K Flip-Flop with Clear and Preset
2	7485	4-Bit Magnitude Comparator
2	7486	Quad 2-Input XOR Gate
1	74151	8-Input Multiplexer
1	74164	8-Bit Serial In/Parallel Out Shift Register
1	74176	4-Bit BCD Decade Counter
1	74177	4-Bit Binary Counter
1	74181	4-Bit Arithmetic Logic Unit (ALU)
1	MAN71A	Common Anode 7-Segment Display