

Experiments for the Lab9500

Part I Combinational Logic

Part I of the experiments deals with combinational logic, logic without memory. It may be desirable, however, to use flip-flops on occasion to display results that are of a momentary nature, or for some other legitimate reason. So while flip-flops can be used in this experimentation, the experiments are designed to illustrate combinational logic.

The HDL, ABEL, was a big step forward in simplifying the implementation of logic. Some of the advanced features of ABEL greatly ease the design of logic. However, it may do a disservice to the student to skip over traditional approaches to design and favor the advanced features of an HDL that minimize the need for understanding and creativity on the part of the student. For that reason, for a particular experiment goal, more than a single approach may be suggested. The instructor is free to pick those which best suit his own needs and philosophy. If time permits, it may be a good idea to include as many of the suggested approaches as possible.

Chapter 1 deals with the availability and naming of on-board I/O. I/O could be named generically, S0, S1, . . . , L0, L1, etc., or named functionally as it pertains to a particular experiment. As mentioned already, it is advantageous to keep signal names as short as possible, for avoiding errors and making equations considerably easier to read. The experiments suggest signal names. It is up to the instructor to decide whether these signal names be enforced. Deciphering code (and grading) will be much easier if there is uniformity in signal names.

Experiments in Part I begin with a "1" and are numbered modulo five so that experiments can be added at appropriate places without the need for constant renumbering. Eventually, a serial modulo one sequence will be established.