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VHDL Representations of Some Hardware Architectures, a Basic Computer and an Assembler

Abstract - This Paper is intended as a follow up to my previous project, "VHDL: An Introduction." This paper assumes that the previous paper has been read and also assumes a working knowledge of VHDL. In this paper, the EE126 Projects as well as the EE126 Basic Computer shall be presented and a Synthesis ready VHDL code shall be presented. All the code will be presented along with VHDL test benches and full simulation results.

The purpose of this paper is to expand the current knowledge of VHDL for Tufts students, providing exposure to real world problems and real world VHDL solutions. By combining the VHDL with actually constructing hardware, a computer engineering student will be ready to enter the work force with knowledge useful to his career.

The main issues described in this paper are:

(i) VHDL Implementation of a Serial Arithmetic and Logic Unit

(ii) VHDL Implementation of a Serial Binary Multiplier

(iii) VHDL Implementation of the EE126 Simple Computer

(iv) VHDL Implementation of the Basic Computer

(v) Basic Computer Assembler