



Simple RTM System with Program Control - aka "A Computer": This is most of LabD and its design is my variations on a theme by ARM. The short lines on the sides of almost all the functional blocks are the control lines for that block. For example, the short line just above the DIN bus on the left side of the register file is the set of lines that select what registers feed the A and B buses,

which register will be affected by a write operation and whether a write should take place. The control lines all originate in the Instruction Decoder. There are a number of ways to implement the controller block, some of which can use FSMs to produce sequences of control signals. The slash lines across many of the wires represent buses of whatever the standard data bus width is for that machine. In Lab D this is 16 bits. The use of tristate drivers for bus multiplexing is schematic of function rather than implementation. Some or all of that function may be done with multiplexers instead. The BOOT line at the lower left is asserted at turnon of power and forces the controller to fetch an instruction from a particular location in memory, often at address 0x00000.