

We wish to add the instruction **sll** (shift left logical).

A modification to the data path is necessary (see the figure below) to feed the shamt field (instruction[10:6]) to the ALU in order to determine the shift amount. The instruction is in R-Format and is controlled according to the first line in Figure 5.18 on page 308. The ALU will identify the sll operation by the ALUOp field. Figure 5.13 on page 302 should be modified to recognize the opcode of sll: the third line should be changed to 1X1X0000 0010 (to discriminate the add and sll functions), and a new line, inserted, for example, 1X0X0000 0011 (to define sll by the 0011 operation code).

