LAB 4
SIMULATING I/O PORTS

OBJECTIVES:

- To examine the I/O port operation using a simulator.
- To trace through a CALL subroutine using a simulator.

REFERENCE:

- Mazidi and McKinlay, "The 8051 Microcontroller and Embedded Systems".

MATERIALS:

- 8051 assembler and simulator.

ACTIVITY 1

Write and assemble a program to toggle all the bits of P0, P1, and P2 continuously by sending 55H and AAH to these ports. Put a time delay between the "on" and "off" states. Then using the simulator, single-step through the program and examine the ports. Do not single-step through the time delay call.

ACTIVITY 2

Using a simulator, write a program to get a byte of data from P1 and send it to P0 and P2. Also, give a copy of it to registers R0, R1, and R2. Single-step the program and examine the ports and registers.

EXAMINING THE CY FLAG AND THE STACK

OBJECTIVES:

- To examine the flag bits of the PSW.
- To examine the stack.

REFERENCE:

- Mazidi and McKinlay, "The 8051 Microcontroller and Embedded Systems," Chapter 2.

MATERIALS:

- 8051 assembler and simulator.

ACTIVITY 1

Write and assemble a program to add the following data and then use the simulator to examine the CY flag.

92H, 23H, 66H, 87H, F5H

ACTIVITY 2

Write and assemble a program to load values into each of registers R0 - R4 and then push each of these registers onto the stack. Single-step the program, and examine the stack and the SP register after the execution of each instruction.

ACTIVITY 3

Write and assemble a program to:

(a) Set SP = 0D,
(b) Put a different value in each of RAM locations 0D, 0C, 0B, 0A, 09, and 08,
(c) POP each stack location into registers R0 - R4.

Use the simulator to single-step and examine the registers, the stack, and the stack pointer.