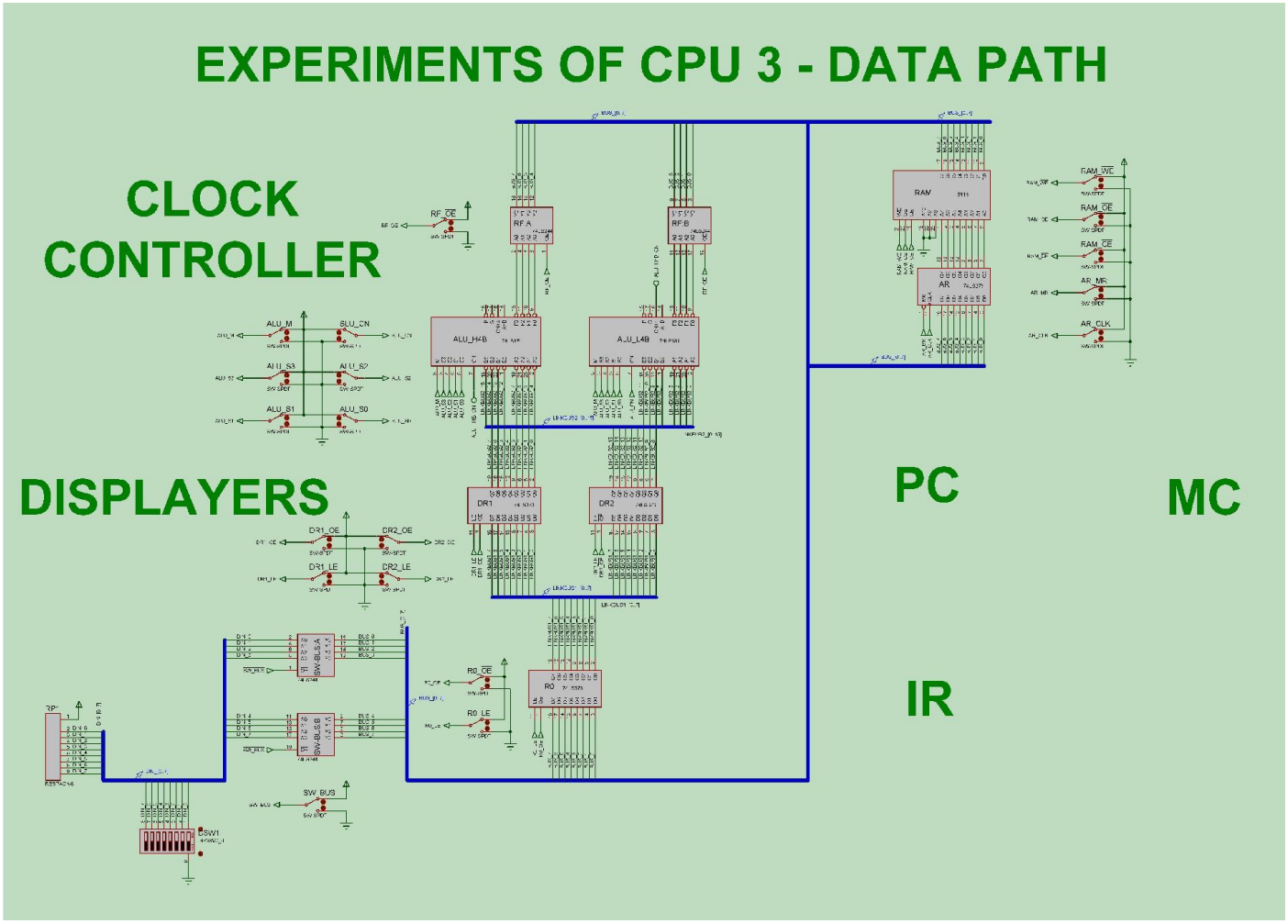
Laboratory Manual of Computer Organization and Architecture

EXPERIMENTS 3 – DATA PATH

Circuit Diagram



Steps of the Experiment

(1) Reset all the enabling pins of 74LS181 and set the other enabling pins. Then start the simulation.

(2) Enable the $\overline{\text{SW-BUS}}$. Write data 19H on the BUS. Enable the R0_$\overline{\text{OE}}$ and DR1_$\overline{\text{OE}}$. Reset the enabling pin DR1_LE.

(3) Write data 02H to DR2 using the same way mentioned in step (2). Then set the R0_$\overline{\text{OE}}$ and $\overline{\text{SW-BUS}}$.

(4) Set the enabling pins $S_3S_2S_1S_0$ into 1110 and set the enabling pin M (OR calculation).

(5) Enable the RF_$\overline{\text{OE}}$ and R0_$\overline{\text{OE}}$. Reset the enabling pin R0_LE. Disable the RF_$\overline{\text{OE}}$. Give a single positive pulse to DR2_LE. The set the R0_LE at last.(Save the result to DR2 for purpose)

(6) Set the enabling pins $S_3S_2S_1S_0$ into 0110 and set the enabling pin M (XOR calculation).

(7) Save the result to DR1 using the same way mentioned in step (5).

(8) Write address 0AAH into AR using the way mentioned in experiment 2. Set the enabling pins $S_3S_2S_1S_0$ into 1111 and set the enabling pin M (Output operand A directly to BUS). Enable the RF_$\overline{\text{OE}}$. Write the data on BUS into RAM.

(9) Write the operand B which is in DR2 into RAM addressed 0ABH using the same way mentioned in step (8). (To Output operand B directly, Set the enabling pins $S_3S_2S_1S_0$ into 1010 and set the enabling pin M)

(10) Pause the simulation. Click the menu 'Debug' and then 'Memory Contents-RAM' to see data written in RAM.

Please answer the questions below according to the steps above:

1. What are the contents in RAM?
2. What is the main function according to the steps?
3. Can you complete the main function with fewer steps? If you can, please write it down.

EXPERIMENTS OF CPU 3 - DATA PATH

CLOCK CONTROLLER

DISPLAYERS

PC

MC

IR