Modified Simple As Possible Computer Design

USER MANUAL

How to Load Program from ROM to the system memory RAM:-

- Open MATLAB file named- 'Assembler_code'.
- Open text editor named- 'code'.
- Write your code in the text document and save it.
- Compile MATLAB .m file to create the bin file or machine code for the system.
- Open the Schematic file.
- Go to child sheet of RAM.
- Load the bin file into the ROM dedicated for auto-loading for the code.
- Then exit to parent sheet.
- Start simulation play button.
- Go to Control Panel and Start_LOADING.
- Here I have used 1Hz clock for debugging. So, you have to stop the loading manually by FINISH_LOADING.
- Or you can set high frequency clock in the RAM child sheet for auto load competition. When load is complete the loading address will be shown like FF00. For this mode you have to disconnect the manual load off button named FINISH_LOADING in the control panel.

How to Simulate Code:-

- In the control panel there are three types of simulation can be performed.
- Select any type of simulation you want.
- FULL_RUN means the simulation will continue until the HLT in your code.
- SINGLE_INSTRUCTION means simulation will continue for one instruction. You have to HIGH NEXT_INSTRUCTION for the next instruction. Make it low for the next instruction.
- SINGLE_TSTATE means simulation will continue for one T state. You have to HIGH NEXT_Tstate for the next T state. Make it low for the next T state.
- After selecting any type of simulation you have to make 'SIMULATE' Logic 1 all the time of your simulation.
- Simulation will be stopped automatically after getting HLT command in your code.

How to Write Code:-

- Open the ‘code’ text document to write your code.
- Here is given some sample codes. You may take help from those codes.
- You can only use the XX7 opcode command in your code.
- Assembler is case sensitive as I have used MATLAB for making the assembler. So, you have to write command in capital letter.
- For constant value you must define the type of your number. For hexadecimal input you have to write ‘H’ or for decimal input ‘D’. For example:- 23H,23D.
- No gap is allowed between two adjacent lines in the text editor.

How to take INPUT:-

- In INPUT [address] execution you have to give the PC an input. During this time program clock will be stopped. No T state will be executed. Then you have to give an input by hex keypad.
- When you are done you have to press the button in the control panel to start the execution again.
- Lower nibble should be given first then upper nibble should be given. If you input another nibble then the last nibble will be discarded and update the upper nibble with new one and lower nibble with the previous upper nibble.

Sample RUN:-

There is code already loaded in the schematics. The code is detecting the input number is either even or odd. You can input a number if the number is odd the final output of A Register is 01 and if the number is even the final output is 02. When simulation is running look at the indicator panel. When Sn and CLOCK both becomes LOW means your program is halted for taking input. You should give the input using hex-keypad and press the button in the control panel. To run this code you should follow the following steps:-

START SIMULATION> Control Panel> START_LOADING> for manually stop seeing finishing your loading – FINISH_LOADING> Make START_LOADING and FINISH_LOADING active LOW> Select FULL_RUN> SIMULATE.