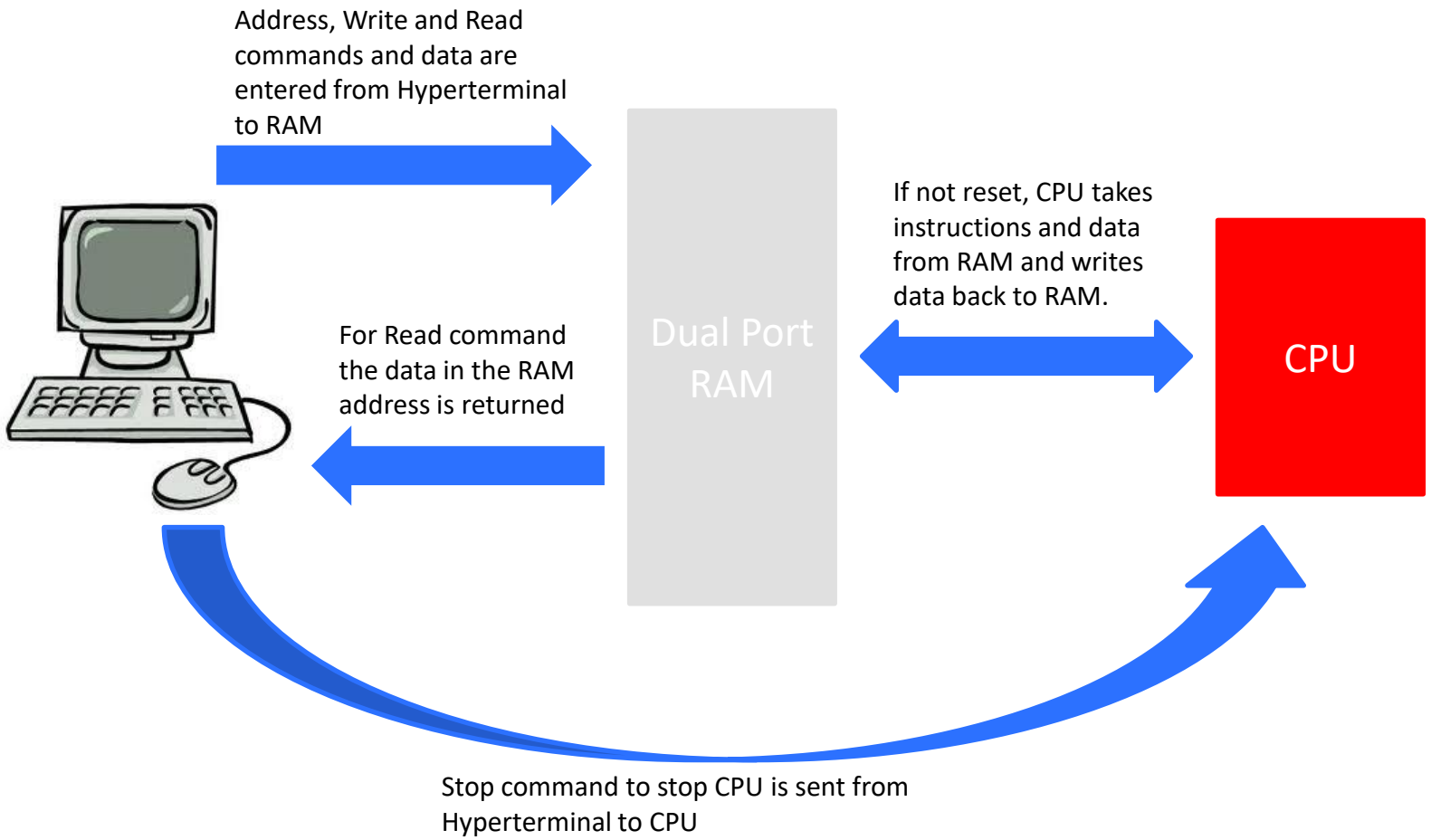
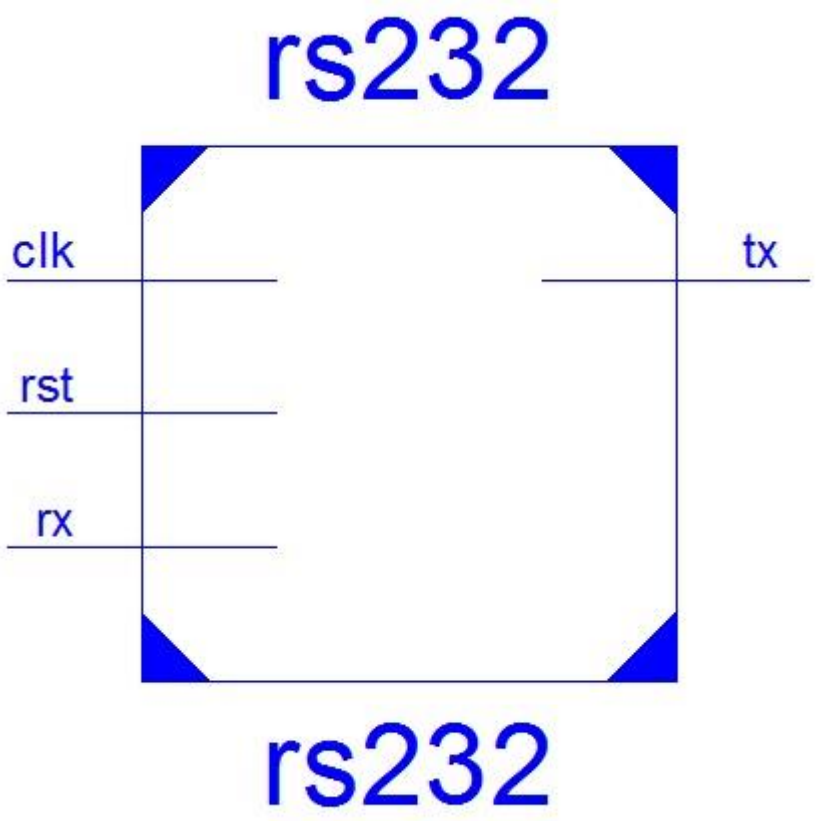
# VerySimpleCPU with RS232

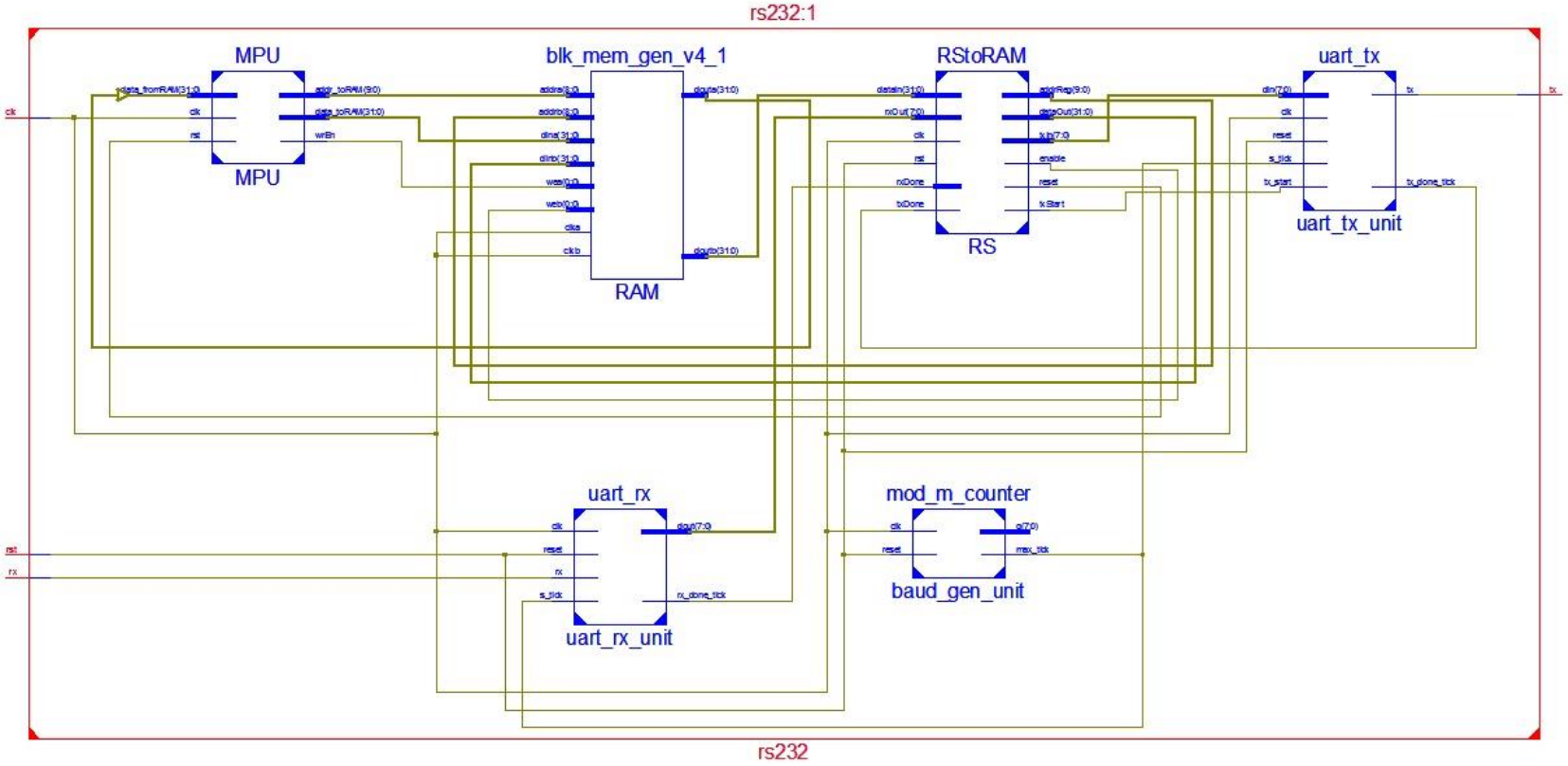
## Design Behavior:



Top Level:



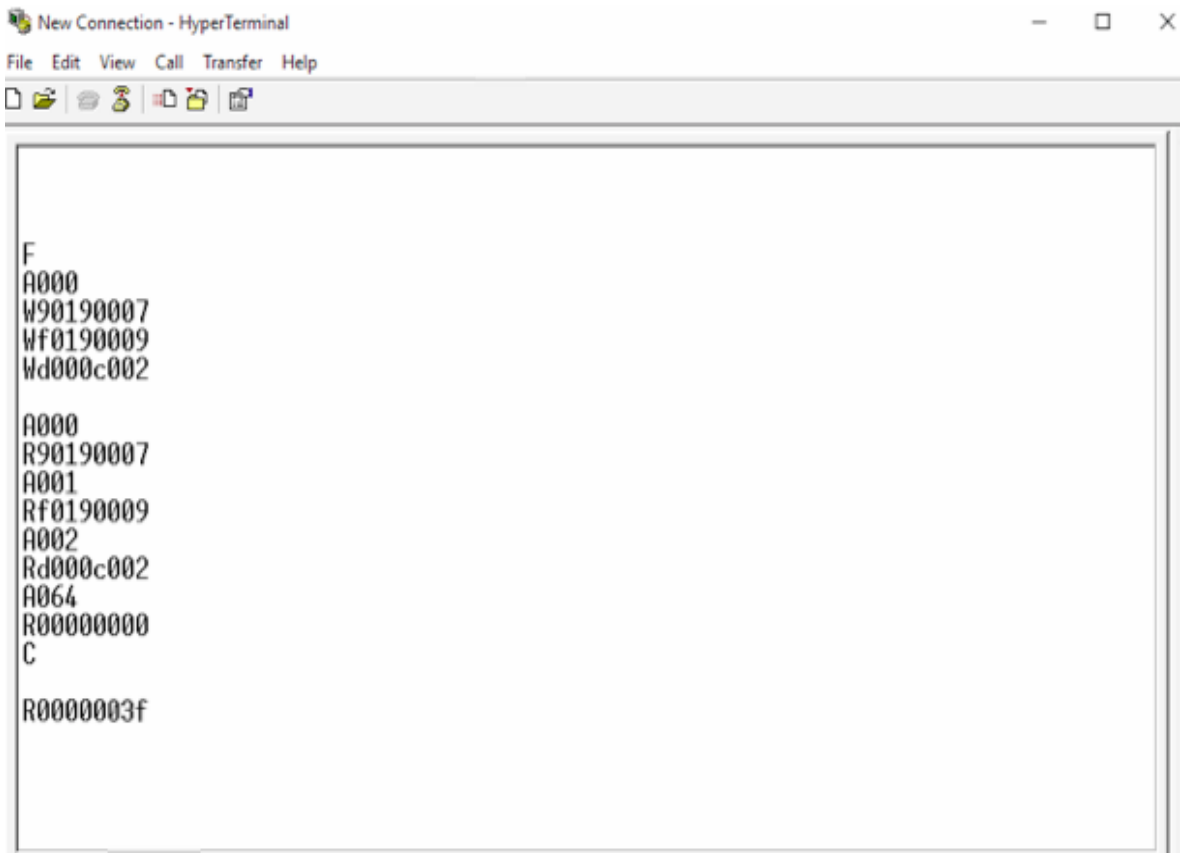
# Design Submodules:



## Design Submodules:

- MPU is a VerySimpleCPU.
- RAM is a true dual-port RAM that has 2 ports.
- uart_rx_unit deserializes data received from RS232 port.
- uart_tx_unit serializes the data to be sent back to RS232 port.
- baud_gen_unit handles the sampling rate of the serial data sent to or received from RS232 port.
- RS is the port that translates the command sent from terminal to RAM and MPU.

# Communication Protocol:




The commands entered here:

- Pauses the CPU
- Sets address to 0
- Write instructions below to addresses 0, 1, 2
  - Writes number 7 to address 100
  - Multiplies 9 with the number in address 100 and writes the result back to 100
  - Loops on address 2
- Check the data on addresses 0, 1, 2, 100 (h064)
- Continues the CPU
- Reads the data on address 100 (h064) which is 7 * 9 = 63 (h3f)

Communication Protocol:

- There are five commands in total, that are Address, Write, Read, Freeze and Continue CPU. All commands are capital letters.
- All numbers should be entered in hex (0123456789 and abcdef lowercase).
- Address should be entered as three hex digits, even if it is not three digits long.
- Data should be entered in eight hex digits, even if it is not eight digits long.
- When data is entered to a memory address using Write, new address location will be updated to 'address + 1' which will enable uninterrupted data writing.
- CPU can be paused by using Freeze command. It is necessary to pause CPU while writing into RAM.
- Read command reads the data in the current address.