The Clock

2.8 GHz \quad 2.8 \times 10^9 \text{ cycles/second}
Flip-Flops help to synchronize with the clock.
Current state is maintained in one clock cycle.
Next state is updated at the start of next clock cycle.
Registers

Storage locations in the CPU to store data for operations, etc.

- MAR (Memory Address Register)
- MDR (Memory Data Register)
- Control Unit
- Logic Unit
- Input
- Output
- Memory
- Program Counter (Instruction Pointer) $PC$
- Instruction Register
- TEMP registers

Word Length

Size of data elements processed by the ALU

- e.g. 16-bits, 32-bits, 64-bits, etc.
LC-3 Specs & Main Components

**Memory**
- Addressability is 16 bits
- Address space is $2^{16} = 65,536$
- MAR, MDR

**CPU**
- ALU Word length is 16 bits
- ALU can perform ADD, AND, and NOT
- Has 8 16-bit registers (R0, R1, ..., R7)
- CU has a CLK
- CU has an Instruction Register (IR)
- CU has a Program Counter (PC)

**Input**
- Keyboard
- Has KBDR and KBSR

**Output**
- Monitor
  Has DDR and DSR