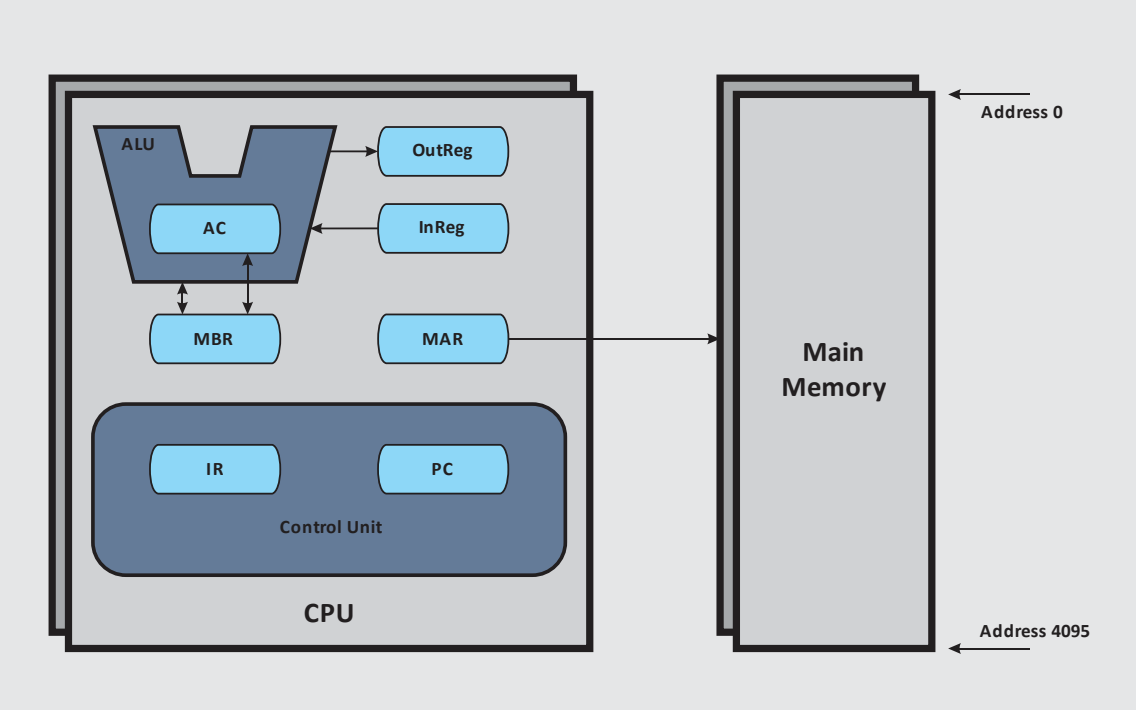

Figure 4.8 MARIE's Architecture

- The computer's CPU fetches, decodes, and executes program instructions.
- The two principal parts of the CPU are the *datapath* and the *control unit*.
- The datapath consists of an arithmetic-logic unit and storage units (registers) that are interconnected by a data bus that is also connected to main memory.
- Various CPU components perform sequenced operations according to signals provided by its control unit.
- Registers hold data that can be readily accessed by the CPU.
- They can be implemented using D flip-flops.
  - A 32-bit register requires 32 D flip-flops.
- The arithmetic-logic unit (ALU) carries out logical and arithmetic operations as directed by the control unit.
- The control unit determines which actions to carry out according to the values in a program counter register and a status register.

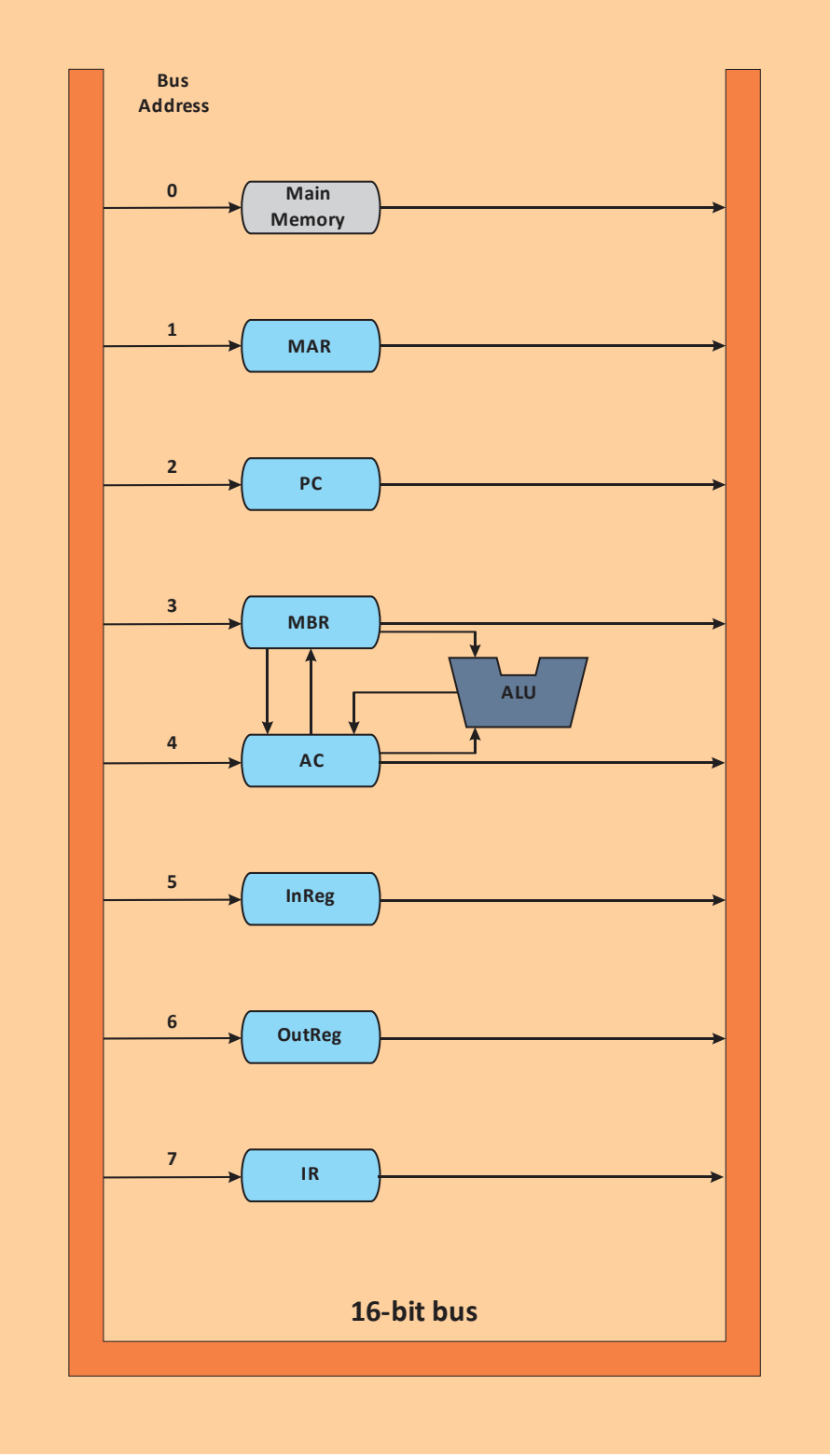

FIGURE 4.9 Datapath in Marie