**UNIT 9**

**THE CPU MAIN COMPONENTS.**

As it is known the two functional units of the CPU are the control unit (CU) and the arithmetic-logical unit (ALU). The control unit manages and coordinates the entire computer system. It obtains instructions from the program stored in main memory, interprets the instructions, and issues signals that cause other units of the system to execute them.

The control unit operates by reading one instruction at a time from memory and taking the action called for by each instruction. In this way it controls the flow between the main storage and the arithmetic-logical unit.

The control unit has the following components: a counter that selects the instructions, one at a time, from memory; a register that temporarily holds the instructions read from memory while it is being executed; a decoder that takes the coded instruction and breaks it down into individual commands necessary to carry it out; a clock, which produces marks at regular intervals. These timing marks are electronic and very rapid.

The sequence of control unit operations is as follows. The next instruction to be executed is read out from primary storage into the storage register. The instruction is passed from the storage to the instruction register. Then the operation part of the instruction is decoded so that proper arithmetic or logical operation can be performed. The address of the operand is sent from the instruction register to the address register. At last the instruction counter register provides the address register with the address of the next instruction to be executed.

The arithmetic-logical unit (ALU) executes the processing operrand is sent from the instruction register to the processing operations called for by the instructions brought from main memory by the control unit. Binary arithmetic, the logical operations and some special functions are performed by the arithmetical-logical unit.

Data enter the ALU and return to main storage though the storage register. The accumulator serving as a register holds the results of processing operations. The results of arithmetic operations are returned to the accumulator for transfer to main storage though the storage register. The comparer performs logical comparisons of the contents of the storage register and the accumulator. Typically, the comparer tests for conditions such as “less than”, “equal to”, or “greater than”.

So as you see the primary components of the arithmetic-logical unit are banks of bistable devices, which are called register. Their purpose is to hold the numbers involved in the calculation and hold the results temporarily until they can be transferred to memory. At the core of the ALU is a very high speed binary adder, which is used to carry out at least the four basic arithmetic functions (addition, subtraction, multiplication and division). The logical unit consists of electronic circuitry which compares information and makes decisions based upon the results of the comparison.

**Copy out the vocabulary:**

control unit (CU) – блок управления

arithmetic-logical unit (ALU) – арифметико-логический блок

to obtain – получать

to store – хранить

to issue – выдавать

to execute – выполнять

flow – поток

counter – счетчик

register – регистр

decoder – декодер

to carry out – выполнять

rapid – быстрый

sequence – последовательность

primary storage – первичное хранилище

storage register – регистр хранения

instruction register – регистр команд

operand – операнд/объект действия

address register – адресный регистр

binary arithmetic – двоичная арифметика

accumulator – аккумулятор/сумматор

comparer – компаратор/блок сравнения

logical comparisons – логическое сравнение

banks of bistable devices – система бистальных устройств (устройств с двумя устойчивыми состояниями)

binary adder – двоичный сумматор

electronic circuitry – электронная схема

1. **Answer the following questions:**
2. What are the functional units of CPU?
3. What is the function of CU?
4. How does CU operate?
5. What is the function of a counter?
6. What role does a decoder play?
7. What is the sequence of cu operations?
8. What is the function of the arithmetic-logical unit?
9. What operations are performed by ALU?
10. What primary components does ALU consist of?
11. What is the function of an accumulator?
12. **Find equivalents for the following words and word combinations in the text:**
13. результаты сравнения;
14. принимать решения;
15. умножение;
16. двоичный сумматор;
17. сложение;
18. адресный регистр;
19. дешифратор;
20. вычитание;
21. адрес операнда;
22. датчик;
23. счетчик;
24. регистр памяти;
25. основная память;
26. последовательность операций.