Text 1. FUNCTIONAL UNITS OF DIGITAL COMPUTERS

As we know, all computer operations can be grouped into five functional categories. The method in which these five functional categories are related to one another represents the functional organization of a digital computer. By studying the functional organization, a broad view of the computer is received. The five major functional units of a digital computer are:

1) Input — to insert outside information into the machine;

2) Storage or memory — to store information and make it available at the appropriate time;

3) Arithmeticlogical unit — to perform the calculations;

4) Output — to remove data from the machine to the outside world and 5) Control unit — to cause all parts of a computer to act as a team. Figure 5 shows how the five functional units of the computer act together. A complete set of instructions and data are usually fed through the input equipment to the memory where they are stored. Each instruction is then fed to the control unit.

The control unit interprets the instructions and issues commands to the other functional units to cause operations to be performed on the data. Arithmetic operations are performed in the arithmetic-logical unit, and the results are then fed back to the memory. Information may be fed from either the arithmetic unit or the memory through the output equipment to the outside world. The five units of the computer must communicate with each other. They can do this by means of a machine language which uses a code composed of combinations of electric pulses. These pulse combinations are usually represented by zeros and ones, where the one may be a pulse and the zero — a nopulse.

Numbers are communicated between one unit and another by means of these one-zero or pulse — no pulse combinations. The input has the additional job of converting the information fed in by the operator into machine language. In other words, it translates from our language into the pulse — nopulse combinations understandable to the computer. The output’s additional job is converting the pulse — no-pulse combinations into a form understandable to us, such as a printed report.