

8 Memory

Most general computers, like your PC for example, use the Von Neumann architecture. This means that the computer has one large memory used for data as well as for the program. How much the program needs of each type is dynamically allocated, so it can change while the program is running. The advantage of this structure is that you can make optimal use of the available memory. If your program is small you can have a lot of data.

Note that we are referring to memory, not hard disk space. The disadvantage is that while running the processor will need to know what the next step in the program is but it may also need some data. Since both data and program are in the same memory, and you can only read one location at a time the program will have to wait for the data to be fetched.

Von Neumann architecture means memory can be used for data as well as program.

The 18F4455 uses the Harvard architecture. This means that the computer has separate memory for program and data. This means that program and data can be fetched simultaneously, which results in a higher speed. The downside is that the available memory is never optimally used. Small programs can't have more data than large programs.

Harvard architecture means memory is dedicated to a specific function.

The 18F4455 has three types of memory: program memory, and two types of data memory.