



## ACCESS TIME

This refers to the time taken to locate a particular item from within a whole collection of data. The term is most commonly used when referring to the length of time needed to locate any particular record within a file — especially in database applications. For many business applications, the efficiency of a program will be far more strongly determined by the average access time of the disk than by the clock speed of the CPU.

The access time is quite different from the 'data transfer rate' — which is the speed at which bits will be transmitted from disk to computer once the item has been found. On the Sinclair Microdrive, for example, the average access time of a piece of data is 3.5 seconds. The minimum is zero, if the data is opposite the read-head mechanism when the request is made; and the maximum is seven seconds, if it has to wait for a complete circulation of the tape loop. This is very slow when compared with a floppy or hard disk unit, where the average might be nearer to half a second. However, the data transfer rate of the Microdrive (16 Kbytes per second) is very fast, and is as good as any disk.

## ACCUMULATOR

Inside a microprocessor or CPU there are several registers. These are individual bytes of memory that perform all the arithmetic and logical functions of the processor. Probably the most active and important of these is the accumulator, which is linked directly into the Arithmetic Logic Unit (ALU). The chief function of the accumulator is its ability to accumulate values: that is to say the contents of a byte can be simply added into, or subtracted from, this register. To the BASIC programmer, the accumulator is both invisible and inaccessible (although it will be used by the BASIC interpreter thousands of times every second). To the machine code programmer, however, the majority of instructions in every program written will involve some manipulation of the accumulator.



## ACOUSTIC COUPLER

The transmission characteristics of a telephone line are such that it can only be used to transmit frequencies in the range 300 Hz to 3400 Hz — the range required to transmit normal speech intelligibly. This 'bandwidth' also determines the maximum rate at which binary data can be transmitted. Some system is needed, therefore, to

ensure that the signal to be sent always falls within this range. This is called 'modulation'.

One system of modulation represents a binary zero as a tone in one frequency (let's say 1000 Hz), and a binary one is represented by another tone in a different frequency (e.g. 2000 Hz). The device for converting between binary data signals and these audio frequencies is called a 'modem' (MOdulator/DEModulator). For best results the modem should be wired directly into the telephone line, but this can only be done for a permanent installation. For portable applications (such as salesmen transmitting the day's figures back to central office, or journalists sending copy to their editors) an acoustic coupler is necessary.

An acoustic coupler is simply a modem with two rubber cups (one for the mouthpiece and one for the earpiece) into which a telephone handset is pushed. Were you to remove the handset during a transmission, you would be able to hear the data being transmitted in the form of tones. However, by interrupting the flow of data, you would create errors in the received data.

## ACRONYM

BASIC is an acronym, so is PET, and FIFO, RAM, EPROM and SNAFU. An acronym is a word formed by taking the initial letter from each word in a description or title. Acronyms seem to be very popular in the computer industry, both for buzzwords and for proprietary names for products. One suspects, however, that often the final acronym has been thought up first, and then the component words have been fitted to that. Who would really want to call a programming language Beginner's All-purpose Symbolic Instruction Code, or a new computer the Locally Integrated Software Architecture?



## ADA

In the late 1970s, C.I.I. Honeywell Bull in France designed and specified a programming language primarily for use by the U.S. Defense Department. It was intended to replace all the other programming languages they were using at the time, and was therefore also intended to vary as little as possible between machines. The language is very highly structured — it is described by some as a kind of super PASCAL, but by others as 'unwieldy'. It is named in honour of Countess Ada Lovelace, who was a close friend and companion of Charles Babbage and is credited with being the first programmer.

