INFORMATION STORAGE AND RETRIEVAL

Information storage and retrieval is the term used for the accessing and retrieval of information from a magnetic medium such as disk, tape or — in older systems — cards or punched tape. This information may be in the form of files, programs, data or graphics. It is necessary to use a storage medium that will not only retain the information when the power is switched off, but also allow the computer to read the information back in at some other time. This means that a computer must have, or be attached to, an interface that can read and write the data. Thus information storage and retrieval has come to mean not only the process of reading and writing information, but also the techniques involved in such a process.

INFORMATION TECHNOLOGY

In one sense, *information technology* has been around for thousands of years: hieroglyphics, the abacus, the quill pen and the printing press are all examples. In the last decade or so, following the development of microelectronics and the subsequent dramatic fall in the price of such circuitry, information technology (IT) has come to mean the electronic storage, transmission and processing of information — specifically with reference to computers, video and telecommunications. As such, IT has already had a profound effect on much of the world's population, and most major organisations are now dependent on computers. An enormous amount of effort and resources is currently being put into information technology. The world now depends for its communications on satellites, such as COMSAT, while other satellites constantly monitor every inch of the world's surface.

INFORMATION THEORY

Information theory (developed by Claude Shannon at Bell Laboratories, New Jersey, in 1948) is the area of computing that investigates the transmission of data. It involves the examination of newly-arrived data and whether it tells us something new — that is, the extent to which it reduces the *uncertainty* in the information system. Thus, information theory consists of the study of the nature of the information and its speed of arrival. In its simplest form, this restricts information theory to the rate at which new information arrives, and from which channel or source.

However, in a wider sense, information theory can include such areas as coding theory. This discipline covers the translation of data from one form to another, and how this can be accomplished efficiently without any loss of the information being transmitted.

INITIALISATION

Primarily, *initialisation* is the process performed by the computer's ROM-based operating system when the machine is switched on. This involves default values being placed in the registers and various addresses in memory. Typically, during initialisation, a microcomputer will set the stack pointer, clear the decimal mode and initialise the various input/output devices. This initialisation will also set the top and bottom of memory pointers and the zero page. Finally, initialisation includes the setting up of the initial screen display and the screen editor variables.

Initialisation has a second meaning: the formatting of disks. This takes the form of writing the track that will contain the disk directory. The information written on this track is the disk's title, the block availability map (BAM) and a list of markers for each track on the disk.

Initialisation can also be performed by a programmer. If a program is to be properly structured, variables should have initial values assigned to them at the beginning of a program. This is often termed the 'initialisation procedure'.

INK JET PRINTER

An *ink jet printer* forms characters by squirting droplets of ink from a nozzle at the piece of paper. Although these printers were developed in the 1960s, it was not until the mid-1970s that their use became widespread.

There are two types of ink jet printer. The *pulsed* jet printer consists of either one or a number of nozzles, which fire several droplets to produce a single dot on the paper. By arranging these dots in patterns, characters can be built up — in much the same way as a dot matrix printer forms its type. If a number of nozzles are fitted to the print head, then the user has the possibilty of multicolour or higher resolution printing.

The other type of ink jet printer is known as the *continuous stream* printer. As its name suggests, this printer shoots a continuous jet of ink at the paper. The droplets in the stream are electrically charged as they leave the nozzle, and then pass between charged electrodes, which alter the direction of the ink stream. The droplets of ink are directed to a precise position, and the character is drawn in much the same way as a pen stroke.

STEVE CROSS

A Drop in Quality
Ink is fired at the paper through a nozzle that breaks the stream into separate droplets. These are electrically charged, which enables the metal deflector plates to direct them into character patterns on the paper — the electron beam in a cathode ray tube is moved around the screen in exactly the same way