
THE MYCOLOGIST GUIDE TO PERSONAL COMPUTING

DAVID MOORE AND DENNIS CRANSTON

*Department of Cell & Structural Biology, Stopford Building, The University,
Manchester M13 9PT*

January 1983 saw **IBM** launch its *Personal Computer* in the UK. Also launched at that time were the **Apple Lisa** and the **DEC Rainbow**. The latter have disappeared yet the chances are that today's purchaser of a personal computer will buy an IBM-compatible machine. There was nothing very special about the **IBM-PC** (or the later AT, XT or OS/2 series) which is why other systems, like **Apple** and **Macintosh**, **Acorn** and **BBC**, and **Atari**, have much to offer. Although IBM were unsuccessful in their attempt to dominate the market, they did unify it to a great extent, establishing *de facto* standards. Other manufacturers must be 'IBM-compatible' to compete in the clone wars started by **Amstrad**.

What can a computer do for you?

Computers process information; though they manipulate the numbers one and zero these can be made to represent real numbers, words or pictures, and even abstract ideas. All of that is in the software. The hardware consists of (i) an input device; (ii) a processor; (iii) an output device. *Input devices*: usually a keyboard input, with the familiar typewriter layout. Input devices send electrical signals and alternatives include sensors, bar-code readers and digitisers. The latter may be a game 'joystick', a 'mouse' (giving more control) and, with even more control and resolution, a puck or stylus. All work through a 'map' held within the computer. As the digitiser is moved it generates X and Y co-ordinates of a pointer on the map. It's just like saying 'pawn to king three', where 'to king three' points to a square in which the information 'pawn' is placed. *Data processing*: the computer's microprocessor does all the calculations but it needs to be

directed by a program, part of which resides permanently in other integrated circuits called **ROM** (read only memory), the rest being loaded into the **RAM** (random access memory). When you switch on, the processor first looks at its ROM and the program within tells the processor what it is, what mechanisms it's connected to and how to work them, and what to do next. *Getting the processed information out*: most computers have a **VDU** (visual display unit), either a TV-like 'monitor' or a liquid crystal display panel. VDUs show the result of the machine's labour but it all stays within the machine and normally you need to output to a printer at least. Other means of output include pen-plotters, modems (modulator-demodulators) which send data on telephone circuits, 'memorising' devices like magnetic and (compact) laser disks, and even robot arms, speech synthesisers e.g. Telecom's speaking clock, and road traffic signals.

Disk drives — hard and floppy

Except for the program in ROM, information in the machine's memory is lost when you switch off, so you need to save data in a form independent of power supplies. Disk drives write (and read) data onto disks with a magnetic coating. The process is analogous to audio and video recording but this design emphasises high capacity and fast random access. It's called 'random' because stored data is accessed in any order; something like a cassette tape is sequential access — you have to read past the parts you do not need to get to those you want. **Floppy disks** are removable and made of plastic. The 8" and 5.25" ones are floppy but the more recent 3" and 3.5" versions are not. Storage capacity

of a floppy depends on the computer. For example, the IBM-PC and Apple IIc can use the same 5.25" disks but the PC gives 360 kilobytes of storage (about 70 pages of text) while the Apple provides only 136 kb. **Hard disks** ('Winchester' drives) are usually fixed within the machine. They have a number of aluminium disks and multiple read/write heads giving high capacity and rapid access, 20 or 30 megabytes of storage is not unusual (around 5000 pages of text) and drives with capacities of several hundred megabytes are now available for personal computers.

Operating systems

The program the processor fetches from ROM when first powered up is the operating system — instructions needed to operate the computer. It is the operating system which is used by applications software to drive the system. A word processor is only able to put your words on the screens because the program uses the operating systems to interpret the keys you strike and to place little dots of light on the screen in the appropriate pattern. Operating systems are hardware dependent; the IBM operating system (MS-DOS or PC-DOS) cannot work an Apple disk drive. However, there is more than one way to operate any given set of hardware and it's possible to program an IBM disk drive to read and write Apple disks. There are many operating systems, seldom compatible with one another.

What to buy

Most people buy a particular computer impulsively, and we are not going to advise a particular brand; but we do recommend: (a) you ensure compatibility with MS-DOS (or PC-DOS) because IBM-compatibles abound and you will undoubtedly want to share data, programs or peripherals with an IBM-compatible in the future; (b) you should go for the largest amount of RAM and the most extensive disk drive storage you can afford, one floppy drive is not enough, two floppies make a workable system, but a hard

disk drive is essential for the more powerful applications; (c) don't buy a closed box — make sure that the machine you buy can be opened up (and that the manuals describe how) so you can fit enhancements in the future.

Applications software

You don't have to program your own computer any more, though there are more languages now if that's what you want to do. However, there are so many programs available that it's difficult to think of a function which is not catered for:

Word processors. At their simplest they are totally correctable typewriters but even a barely adequate one will enable you to move text about, change layout, bring two or more pieces of text together, check spelling, etc. *Desk Top Publishing* programs are super printer controllers, enabling layout and typeface manipulation which can be indistinguishable from traditional typesetting.

Data Bases in their simplest form keep 'record cards' in a computer; the machine doing searches for particular classes of record at your command. The more complex data bases are actually programming languages (called 'management systems') which can create complex interrelationships between the input data and can actually reveal unsuspected connections.

Spread sheet programs handle numbers in a very large table. Each row and column position (called a *cell*) can hold a number, an instruction or a block of text. These programs can execute mathematical and logical functions and the commands can be woven into complex models used for analysis and prediction.

Alongside these are programs for painting and drawing for statistical analysis and graph plotting, programs for computer aided learning, design, and manufacture (CAL, CAD & CAM), there are outliners, hypertext and Hypercard, pop-up programs, sideways printing and pull-down menus. We'll look at some of these in later articles.