



display only 40 columns, regardless of the switch's position.) The second switch toggles between the European character set and the North American characters shown on the keyboard. This is useful when a character is required that can only be found in one of the two sets (such as '#', which is replaced by '£' on the European keyboard). There are two lights above the right edge of the keyboard: one indicates when the power is on, and the other lights when the disk drive is in use.

When you power up the IIC, the disk drive automatically starts spinning and looks for a disk. It will continue to spin until a disk is found, or until the Reset key is pressed while the Control key is held down. With no disk in place, the IIC loads Applesoft BASIC from ROM. Applesoft has been virtually unchanged since the Apple II+ was introduced. It varies only slightly from early versions of standard Microsoft BASIC. The use of Applesoft makes it possible for the IIC to run Applesoft programs written for earlier models. Unfortunately, Applesoft lacks many of the programming structures available in more advanced dialects, such as BBC BASIC. For example, Applesoft has no RANDOMIZE feature, AUTO line numbering facility, IF . . . THEN . . . ELSE structure or WHILE command. It also lacks CIRCLE and PAINT commands for graphics programming.

When there is a disk in the disk drive, the IIC runs either DOS 3.3 (Apple II+ and IIe disks) or the new Apple operating system, PRODOS. This is a derivative of the operating system Apple designed for its first business system, the Apple III. PRODOS has a hierarchical (tree) filing structure. Disk files are stored in much the same way that documents are stored in a filing cabinet. Thus, all files that relate, for example, to project ZED could be filed on the disk under the heading ZED. The accounting files of project ZED — such as Costs, Sales, Revenues — could be gathered into a group called Accounts. With a manual filing system of this type, when you wanted to find the file for Sales, you would first open the main file, ZED, then open the Accounts file, and finally pull out the file marked Sales. In PRODOS, this is done via a 'pathname' that lists the appropriate file names in order, so the process we have just described would be accomplished by typing the file names, separated by slashes:

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/ZED/ACCOUNTS/SALES/
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Pathnames can be up to 64 characters long. This process may seem complicated, and in fact it does take a while to get used to, but in the long run it simplifies the organising and management of disk files. Tree filing systems like PRODOS are also used in MS/DOS, the operating system used on the IBM PC.

The screen display of the IIC is also an improvement on previous models. Besides two text options (24 lines by 40 or 80 characters), the IIC has three graphics screens: 40 by 40 (Lo-Res), 280 by 192 (Hi-Res), and 560 by 192 (called Double Hi-Res). There are 16 colours available.

Cautionary Tale



Apple III

The Lisa

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Realising the importance of the business computer market, Apple developed the Apple III, a brilliant desktop machine that makes use of two 6502 processors to support up to 512K of memory. The Apple III runs an operating system called SOS (Sophisticated Operating System), that permits the III to communicate with a hard disk storage unit and stores files in a hierarchical file structure. This tree structure formed the conceptual basis for the Lisa operating system, and many of its features appeared in MS/DOS on the IBM PC. Unfortunately, the III had a number of hardware difficulties immediately after it was introduced, and earned a bad reputation. Apple recalled and replaced all the faulty machines, but the III never overcame the bad publicity it received, nor the feeling of many users that the operating system was too complicated. As a result, the Apple III is no longer on sale.

The Lisa, introduced in spring 1983, was the first mass-market personal computer to use integrated, windowing software, had an operating system based on pictures rather than words, and was operated by a hand-control device: the mouse. The Lisa created so much excitement that it caused Apple company stock to jump from \$24 per share to over \$60 in the space of a few months. Developed at a cost of over \$50 million, the Lisa was priced too high and aimed at the wrong market. Apple originally targeted the Lisa for executives of large corporations. While some senior executives have been very impressed by the Lisa, most of its sales have gone to small companies in specialised businesses, like advertising, graphic design, and public relations. The Lisa did not sell as well as expected, and Apple's stock plummeted to \$17 a share, again in the space of a few months. The Lisa was recently replaced by the less expensive Lisa II. Under the guidance of John Scully, imported from the Pepsi Cola Company to guide Apple's operations, the innovative computer company appears to have learned from its mistakes. The Macintosh is selling in huge numbers around the world, recovering some of the Lisa/Mac development costs, and the IIC seems poised to breathe renewed life into Apple's breadwinner, the Apple II