

Firm Foundations

In the history of the microcomputer, developments in hardware and software are inextricably linked, and it is as much a story about personalities as products

There have been several episodes in history in which the pace of technological change has left people bewildered. But nothing to date — not even the progress of flight, from the Wright brothers to lunar exploration — can match the speed of the microelectronics revolution. The progress from the first primitive microprocessors to today's 16-bit designs, from the first microsystems to today's desktop mainframes, has taken just a decade. And the speed of development is still increasing.

Around 1971, several of the new chipmaking firms in California concluded that the main functions of a computer could be housed on a single sliver of silicon. There were no grandiose plans for a revolution then, and no talk of 'information technology'. The idea was to produce a small and cheap computer that might be used to control factory machines or lifts, and the first microprocessors were well suited to such tasks.

One of these chipmakers, Intel, is generally credited with producing the first microprocessor, called the 4004. The 'fours' in the number refer to its power: it was a four-bit processor handling data in blocks of four binary digits. It could only use small quantities of memory — just enough for a lift control program, for example.

By 1972 Intel had developed the 8008 chip, an eight-bit processor, and hobbyists began to think about building computers for themselves around the new chip. Articles in American hobby electronics magazines described how to do it, and although the resulting computers did not have monitor screens, proper keyboards or other sophisticated aids, they were the first home machines. It was from one of these hobby projects that what could be called the first commercial home microcomputer, the Altair 8800, evolved. This was available only in kit form, however.

Then in the next year, came the first 'real' microprocessor, the 8080, again from Intel. This operated on eight-bit blocks of data and could handle up to 64 Kbytes of memory for bigger programs. By this time the other chip firms were starting to catch up. Motorola's 6800 chip did much the same as the 8080. It had similar hardware characteristics but required different instructions to make it work. This is the point where software compatibility problems started: programs written for the 8080 would not run on the 6800, and vice versa.

At the same time, other firms had developed

similar processors, among them National Semiconductor, Signetics and Advanced Micro Devices. But the next major prime mover was MOS Technology, where one of the leading characters in our story, Chuck Peddle (see page 180), was working. Peddle was at MOS Technology when the company developed a processor very like Motorola's 6800, called the 6500. In fact, it was so close to the 6800 that changes had to be made and the revised chip was eventually given the name 6502.

Founding Fathers

Though Chuck Peddle designed both the Commodore PET and the 6502 microprocessor that it was based around, the contribution of Bill Gates, as the author of the Microsoft BASIC built into the PET's ROM, was equally important



COURTESY OF COMMODORE

Chuck Peddle



Commodore was already well-known in Canada for office machinery and electronic calculators. Peddle joined the firm with the idea of developing a personal computer complete with screen, keyboard, cassettes for program storage, and everything else a real computer should have — all built, of course, around the 6502 processor. The machine emerged in 1976 as the PET 2001, a friendly name chosen to convey the idea that the computer was not too advanced for the home user.

But as the first PET was becoming available, two more innovators were preparing to market a computer from a Californian garage. Steve Wozniak (see page 155) had always wanted to own a computer, and joining the Homebrew Computer Club showed him it could be done. He designed a computer on a single circuit board, and with his friend Steve Jobs began making and



TONY SLEEP

Bill Gates