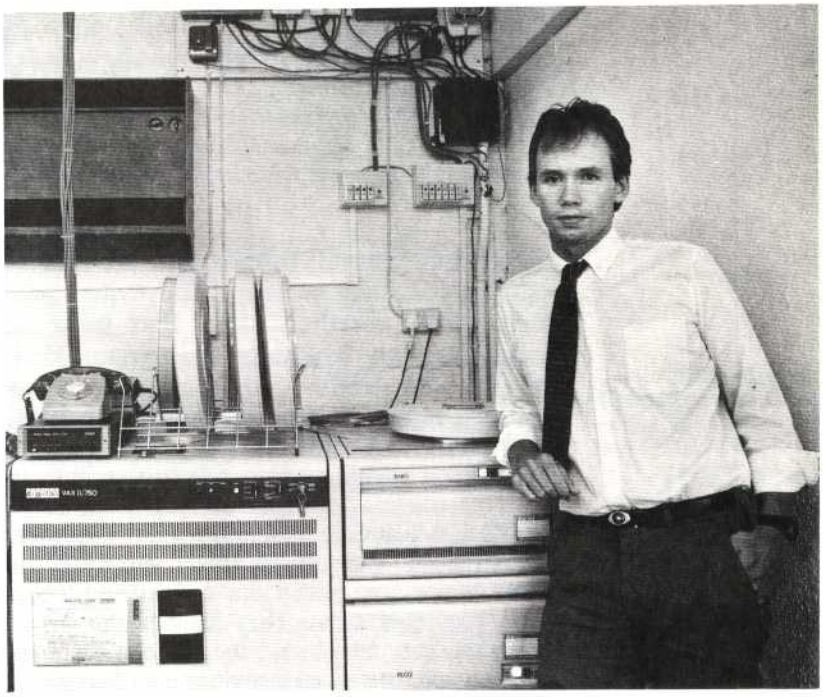
When it went on to create the Horizons tape issued with every Spectrum, Psion bought a TRS-80 with disks, a machine that uses the same Z80 processor, and built a special interface between the two machines. But by August 1982, the company decided that it couldn't go on knocking up a completely different development system every time a new home computer went on the market. So it ploughed back profits into buying heavy-weight hardware with plenty of spare processing power. In principle, this hardware should be flexible enough to cope with whatever computers the future might bring. The machines chosen were a pair of Vax 750s, running the DEC operating system VMS.

The Vax 750s brought two advantages to Psion: the quality of the software provided by DEC, with the opportunity it provides to create specially designed software aids, and the sheer 'muscle-power' of the operating system and hardware combination. There is plenty of room for a collection of software aids like compilers, libraries of common subroutines, and debugging programs, all shared between the 16 to 20 programmers who may be logged on to a single machine at the same time. The two machines allow software to be easily transferred from one to the other when needed.

Libraries of common subroutines had already been part of Psion's philosophy in the TRS-80 days, but on a dual floppy system swapping the data between disks became tedious. The new Vax machines allow teams of writers to work together, sharing common project libraries from which modules can be called up almost instantly, and libraries can even be shared between teams working on different projects. This is the big advantage of a timesharing system — and as an added bonus it will also take care of their administrative work without having to interrupt the programmers. Psion plans to add a third Vax to shoulder the administration tasks, leaving two machines free for software production.

Even if you could afford it, you would be wrong to think that going out and buying a Vax would instantly put you on a par with Psion. Very little of this well-developed work environment has been handed to Psion on a plate by DEC. It has taken a lot of hard slog, both to get simple tasks performed efficiently and reliably, and in the large number of hand-wrought software aids and utilities (written in C) that Psion has added.

Psion uses C, an 'intermediate-level' language that can produce reasonably compact and fast object code for 16-bit chips like the 8086, although this is far from the case for eight-bit C compilers. So in writing for target machines like the Spectrum it has been necessary for Psion to develop its own special techniques. Psion is not keen to disclose its secrets, but it is known the company used C to write its own compiler, which in default of a name gets called 'our table language'. This looks a little like C, is portable between different processors, and creates extremely efficient code.



TONY SLEEP

Psion
In 1982 this company bought a pair of Vax 750 minicomputers as the basis of their software development system. Each machine allows up to 20 programmers at a time to use the range of cross-compilers, software libraries and debuggers for creating and translating programs

There is a universal rule that system maintenance and writing in-house programming aids like the table language generally takes 30 per cent of the entire programming effort, but Psion finds the extra time well worth while. Having the source code developed in-house means total ownership: you can take it to pieces and improve or adapt it in a way completely impossible with commercially acquired software. If a bug turns up in bought-in software it is difficult or impossible to get it fixed, and there is usually no question of making internal changes.

The special software bought by Psion includes programs that are exact simulations of popular microprocessors, such as the Z80 and 6502. Thus, the giant Vax computers can be made to behave just as if they were Commodore 64s or Spectrums. Despite the power of the Vax computers, the simulators run at a fraction of the speed of the target machine. The advantage is that they allow the programmer to look at the contents of every register inside the microprocessor at any stage of the program. This is particularly useful for tracking down bugs in programs. Normally, when a machine code program goes wrong and crashes, the programmer can't tell what went wrong. Psion can thus save many hours of debugging.

Much of Psion's recent development effort has gone into producing the suite of four standard business programs that are provided with the Sinclair QL. The Motorola 68000 family of chips, one of which powers the QL, was designed around high-level languages, and C programs compile down so efficiently on these chips that writing in assembler becomes unnecessary. If all home computers followed the QL lead, C could replace assembler completely, and Psion and the smaller software houses could leave the Dickensian work of hand-coded translation behind forever.