



notation is used for very large or small numbers. Once again, there is no key labelled CALC on the Organiser's keyboard: it is accessed by pressing the Mode key at any time other than after a FIND search has been executed.

The simplicity and ease of use of the machine is matched by its low price. The Organiser is commercially viable because low-power technology is low-cost as well. The machine can run on a single nine-volt PP3 battery for up to six months, because the circuitry uses CMOS (complementary metal oxide semiconductor) chips and the datapaks are EPROM (erasable programmable read-only memory) chips, both of which have very low power consumption levels. Until recently, the cost of these types of chip would have made the machine too expensive to have sold well.

At the heart of the Organiser is a Hitachi 6301X eight-bit processor, running at 0.93 MHz and controlled by four Kbytes of ROM. There are also two Kbytes of RAM for entered data, screen information and calculator 'working space'. EPROM datapaks slotted in the bottom of the case are the equivalent of RAM memory in other microcomputers. EPROM can be thought of as 'once-only' RAM: data written to it is stored and cannot be removed, although it can be accessed as if it were normal ROM. Thus it is 'programmable' ROM. Using the ERASE function of the Organiser on a record in the chip does *not* free its storage space in the EPROM, but marks the record to indicate to the processor that it is deleted. Thus, the datapaks eventually fill up with data until no new records can be added. The only way to erase the stored data and restore the chip to its original 'clean' state is to expose it to intense ultra-violet light. This is the function of the Psion Formatter, which costs about £40. New datapak chips cost £13 (for eight Kbyte chips) or £20 (16 Kbyte chips) and can be formatted up to 100 times.

The advantage of EPROM over RAM is that it requires no further power to retain data once it has been stored, whereas RAM is 'volatile' and must have a continuous power source. EPROM chips are also very reliable, and byte-for-byte cost one fifth as much as RAM. They are commonly used by computer manufacturers in prototype systems in place of ROM because the chips can be re-used and re-programmed in the event of software errors, whereas an incorrectly programmed ROM must be thrown away. ROM can be used once all the faults in the EPROM-held software have been found.

Communication with other computer devices is possible via an RS232 interface costing £40, which fits into one of the datapak slots and allows data to be transmitted or received at speeds of up to 9,600 baud. The protocols can be programmed using the software provided with the interface so that, for example, output to a printer can be formatted for page lengths and line width.

The Organiser can be used in a wide variety of situations in which a portable and powerful

computer is needed. It could be used to note experimental results or for keeping an engagements diary, although the keyboard seriously limits typing speeds because it is set out alphabetically. The machine would be best used for storing information that requires a large amount of cross-referencing — for example, salesmen's price lists, the indexed contents of a library, or the names, addresses and telephone numbers of friends. It could also be useful in applying a computer program to experimental data on the spot, or for storing information intended for further processing elsewhere.

With its conveniently small size, low power consumption (there is no need for mains adaptors), storage capacities previously only possible with desk-bound machines, and effective database facilities, the Psion Organiser looks set to be a great success amongst people who wish to have a microcomputer in their pocket.

Pocket Computers

Over the past few years, several attempts have been made to market pocket computers of one sort or another. These have sold moderately well but have never achieved even a fraction of the sales of the pocket calculator.

Some pocket computers are little more than glorified calculators. These can be programmed in their own languages, but tend to appeal only to engineers and scientists who need to be able to perform complicated calculations while on the move. The next stage up is pocket computers that can be programmed in BASIC. This makes them more suitable for general use, and so programs have been produced for them that allow stockbrokers to analyse share prices, plumbers to prepare bills and airlines to sell tickets on planes.

Even the top pocket computers haven't really become popular. No decent software has been produced to allow people to keep their diary or address book on them. Even if it had, the computer's memories are often too small to hold a useful amount of information. Small keyboards are difficult to use so most people would rather stick to using pen and paper for diary and address book. Computerised versions of these only offer an advantage when sophisticated search facilities are needed, and this is rare.



Sharp PC 1500



Sharp PC 1251

Sharp makes two pocket computers, the PC 1251 (£80) and PC 1500 (£170). The first of these is the smallest pocket computer on the market, the other is the most powerful. Both are programmed in BASIC, although the PC 1500 has extra commands. Both have 4K of memory as standard, but the PC 1500 can be expanded to 20K

Texas Instruments TI-66

This is essentially a programmable calculator and so should appeal to scientists and mathematicians. It does not handle text, so is unsuitable for more general applications. It has only half a kilobyte (K) of memory and sells for £45



Hewlett Packard 41C

This is a very sophisticated programmable calculator. It is available in three models, the HP-41C, HP-41CV and HP-41CX. The 41CX has 1K of memory and the other two models have 2K. Although the calculator has an alphabetic keyboard, this is only intended for programming use and so the calculator does not handle text. The price ranges from £175 to £278



Casio FX700P

This one of several pocket computers produced by Casio that can be programmed in BASIC. It has 2K of memory and a tiny alphabetic keyboard and costs £60. A version of the machine with a tiny built-in thermal printer is also produced