Off and Running with THE KAYPRO II

THE INTRODUCTION of the Osborne 1 Portable Computer opened a door on a new generation of portable machines. The Kaypro II is one of this new breed—right down to the originator's selling price ($1795) and the inclusion of a spate of software that costs more separately than the computer itself.

The biggest difference between the Osborne and the Kaypro II is that the latter features a 9"-diagonal CRT, and the Osborne's is 5". Also, the Kaypro has a pair of dual-density disk drives while the Osborne uses dual, single-density drives, with double-density available as an option for an additional $200. Dimensions are similar, but the Kaypro, at 26 lb, is 2 lb heavier.

Like the Osborne, the Kaypro II is a general-purpose computer for business and personal applications using CP/M, and both are somewhat like two-suiter cases (when closed) for easy travel.

Description. The Kaypro II Portable Computer is made by Non-Linear Systems and comes in a protective gray-painted metal enclosure (the Osborne is plastic) that measures 18"W × 8"H × 15½"D. The Kaypro has a more squared-off shape than the Osborne, permitting it to stand more evenly on the floor. The end opposite the carrying handle is detachable and contains the keyboard. The line cord is wrapped around four corner lugs and is not

Photo: Ed Galluzzi

An integrated carrying case, all-in-one design with 9" screen, dual-density drives, 64K memory, bundled software, and a modest price are hallmarks of this new portable/desktop microcomputer

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concealed as it is on the Osborne. When detached, the keyboard is connected to the computer through a plug-in telephone-type coiled cable. For travelling overseas, the Kaypro can be set to operate from 220 V ac.

The keyboard consists of 62 sculptured keys, including four "arrow" keys for controlling the position of the cursor. To the right of the QWERTY keyboard is a 14-key numeric cluster that includes its own ENTER key. With the exception of the control keys, all others, including the cursor controls, have an auto-repeat function. The keys have an excellent "feel" and a slight electronic "tick" from an internal transducer lets you know when a key is activated. A red LED under the key indicates when the CAPS LOCK key has been activated. The keyboard is a wedge-shaped platform with the front side 1" high and the rear 3" high.

The manual suggests that the computer can be arranged with the main enclosure's front rubber feet resting on the top rear edge of the keyboard. This makes the unit look like a conventional video terminal. Of course, the keyboard and computer can be separated the distance of the coiled connector cable.

On the front panel, the major difference between the Osborne and the Kaypro II is the layout. The Osborne has each disk drive mounted horizontally, one on each side of the CRT, with a "sleeve" for diskette storage below each drive, while the Kaypro has both disk drives mounted as a vertical pair on one side of the enclosure to the right of the CRT.

The Kaypro uses a Z80A CPU and has 64K bytes of user memory. The display has a green phosphor screen and is 80 columns by 24 rows, with both upper- and lowercase characters.

Data storage is provided by a pair of double-density 5¼" floppy disk drives. These have a capacity of 195K bytes each (compared with the 92K-byte single- or 184K-byte double-density disk drives on the Osborne for an additional $200). The Kaypro can also use the Xerox 820 single-density disk format. This is important because there is much software of this type available. The memory map of the system shows two banks. One is 64K of RAM forming the usual CP/M setup, with the second bank forming the video display RAM and the system PROM. Only the lowest 16K of memory will change with the bank-select bit. Addresses above 3FFF (hex) are always available for either bank.

In use, the software on the Xerox 820 format disk is transferred to a Kaypro II diskette, which can hold the contents of several Xerox 820 single-density disks. (It should be noted that the Kaypro II is not compatible with the Xerox 820 II.)

The Kaypro II has two I/O connectors on the rear panel. One is a Centronics-type parallel connector for output to a parallel printer. The other is a standard DB25 for connection to serial devices. The Kaypro II serial port is an RS232C configured as Data Terminal Equipment (DTE) so it can be directly connected to a modem via an unmodified RS232C cable. The instruction manual details the CP/M instructions to configure the serial I/O. Actually, the Kaypro II has six I/O port addresses: port 0 sets the RS232 baud rate; port 4 is the actual RS232 serial port; port 5 carries the 8-bit data from the keyboard; port 6 is the RS232 status (control and status for the Z80 PIO); port 8 is the 8-bit parallel printer port; while port 1CH is the R/W system port for system control. (The various bits are used for memory bank selection, disk drive control, and printer handshaking.) Unlike the Osborne, the Kaypro II does not have an IEEE-488 connector, nor does it have provisions for battery operation.

The 1920 characters that can be displayed on-screen include standard ASCII plus some extra characters, all mapped on a 5 × 7 display cell. Unlike the Osborne, whose 5" CRT can only display a "window" of 24 rows of 52 characters out of a generated 32 lines of 128 characters, the Kaypro II can display all of its

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1920 characters at one time. A front-panel BRIGHTNESS control is provided to adjust the display as desired, while the 25-MHz video monitor bandwidth enhances viewing of the display. Although the computer has 64K of RAM, a bank separate from the user-RAM area has the 2K system ROM and the 2K video display RAM.

Once the Kaypro is opened and the keyboard is connected, starting the computer is a simple matter of inserting the CP/M diskette in drive A (both drives are clearly identified) and operating the rear-apron power switch. A manual RESET button is also available on the rear apron.

When a drive has been activated, its red LED indicator glows and continues to glow after disk activity has ceased and until either the system is turned off or the other drive is selected. In this way, the user always knows which is the active drive. The only other LED is the POWER indicator.

The software package (which costs $2475 if bought separately) provided with the Kaypro II is based upon standard CP/M-80, version 2.2. The Kaypro II is supplied with MBASIC from Microsoft; and, in addition, S-BASIC is available. This is a structured form of the language that resembles Pascal rather than the more familiar forms of BASIC. It is compiled and must be entered by using the word processor as a screen editor. After the program is written, it is saved with an extension of .BAS. This source file is then compiled using the S-BASIC compiler and the result is a .COM file which can be run directly.

This type of BASIC program runs much faster than either an MBASIC (an interpreter) or a CBASIC (an intermediate compiler type).

The rest of the software provided with the Kaypro II consists of the Perfect family of application programs. This includes the Perfect Writer word processor, and Perfectcalc (an electronic spreadsheet). These are all good programs, but by themselves they are nothing exceptional. When used together as an integrated system, though, there is a synergism that makes this package into a data-processing system that everyone will enjoy using. To get this system as part of a computer package is a powerful inducement to buy.

Perfect Filer is a data base that enables the user to create his own files of records containing the information required for his use. It lets the user input the data and then to retrieve it, to use it in a variety of ways such as printing address labels to everyone in the data base, to supply information for form letters composed with the Perfect Writer, to print invoices for records entered today, and to produce specialized sales reports and lists.

The system allows you to compose and personalize letters to everyone on a mailing list in the data base. You can also include financial information developed within the electronic spreadsheet. It is this capability to utilize the data among all the parts of the family that make the Perfect software so powerful.

The *PerfectCalc* is an electronic spreadsheet that is similar to Supercalc. But its principal feature is that it interfaces with the other programs in the system. It also features the virtual memory feature common to the Perfect family.

The *Perfect Writer* word processor includes a split screen that enables manipulation of up to seven files in memory at a time. For example, you can be composing a manuscript on the lower half (or three quarters) of the screen while searching another document in the upper portion for a paragraph to insert in that manuscript. You can then construct the paragraph to your liking, restore the document to storage in its original form, and return to full-screen editing.

Perfect Writer also produces an index, creates footnotes, and can even produce its own table of contents—something that only very expensive word processors generally can do. In addition, the word processor will also automatically format more than 30 different entry styles for final printing, such as set-off quotations within a body of text, or numbered and/or lettered lists and sublists. If you run out of memory while writing a long manuscript, Perfect Writer provides "virtual memory" where data is swapped back and forth with a diskette. This feature permits very long manuscripts that would exceed the RAM available. In use, the major difference between the Perfect Writer and the previously offered Select word processor is that Select used one-letter commands to select functions, while Perfect Writer requires the use of the CTRL or ESC keys in conjunction with another key to change functions. Up to four keys might be needed for some commands, although the bulk of them require only two keystrokes.

Perfect Speller, a companion dictionary to the word processor, has a 50,000-word dictionary and can process 4000 words per minutes.

User Comments. Booting the Kaypro II is conventional. Once the CP/M prompt is displayed, any CP/M 2.2 diskette can be used. With some alphanumerics on the CRT screen, the BRIGHTNESS control is adjusted for the desired appearance. A small "hood" formed by the top cover of the enclosure shields the screen from much of the overhead lighting. The 80 x 24 display is almost exactly the same size as the finished printed product in a

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10-character/inch (10-pitch) mode.

The Kaypro II User's Guide is a well-written, well-illustrated manual slanted at the first-time user. It is very readable and goes through all the steps required to get the system up and running. Each of the software elements provided with the computer has its own manual. All of them are excellent and spell out all the details of how to get the maximum benefits from that piece of software.

The Kaypro II and similar computers with all-in-one portability are treading ground smoothed by the Osborne 1, or course, right down to bundling of software with the machine for greater value. Not being a pioneer gives such companies an opportunity to introduce improvements such as Kaypro's larger-size CRT, which is a pleasure to use for its size and its green tint, and standard double-density drives. Savvy pioneers often meet the new challenges, though, as Osborne has by introducing a green-phosphor screen, optional double-density drives, and a plug-in modem for current models. And users do claim that the smaller screen represents no problem after working with the machine for awhile.

Moreover, Kaypro's software, though good, is not as widely familiar as is Osborne's, whose WordStar and SuperCalc software packages are household names among computerists. And though Kaypro's S-BASIC is faster than a streak of lightning, it has, to my mind, several serious drawbacks. First S-BASIC is as hard to learn as Pascal or C. So why not use these other structured languages, which have the advantage of being portable? Second, and more important, some of the applications written to run under CP/M are for MBASIC or CBASIC-2, or for some form of Pascal. Therefore, to run them you may have to go out and buy the supporting language. However, today many BASIC applications are supplied as compiled object code. This makes S-BASIC useless for supporting packaged software applications in BASIC. So what good is it? Well, it is a rather nice exercise in structured programming. That is all it is, and I urge people buying the Kaypro II to also buy the real BASIC of their choice. The CBASIC package for the Kaypro II retails for $150, while MBASIC-80 is $320.

For those interested in manufacturer support (and you always should be), Osborne's pioneering has resulted in wider and deeper distribution of its product. Non-Linear Systems, the Kaypro's maker, cannot be easily dismissed as the typical newcomer, though, since it has been an established, reputable company in the instrument field for decades.

Given the foregoing conclusions and considering the tradeoffs, Kaypro is a solid competitor in this modestly priced portable/desktop computer field. —*Leslie Solomon*

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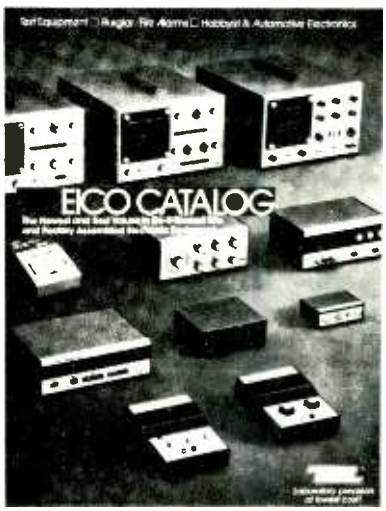

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