

The Epson QX-10/Valdocs System

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These are wonderful days for people who need computers. Microcomputers that do more and more are becoming available—and, paradoxically, they are becoming *less* expensive. The only trouble is that, between the time you order a unit and it is delivered, something better is announced (but you *know* it will be six months to a year before the new unit will be available).

As the saying goes, I've got bad news and good news. The bad news is that, yes, another wonderful computer is about to come out—from Epson, the company that has captured about 75 percent of the printer market. The good news is that the unit is supposed to be available by this Christmas. On the basis of Epson's track record, I believe they'll do it.

BYTE was one of the few companies to be given a private showing this past summer of the Epson QX-10, a computer for less than \$3000 that may well be the first of a new breed of anybody-can-use-it "appliance" computers. Chris Rutkowski, president of Rising Star Enterprises (a consulting firm that works closely with Epson), showed me the QX-10, along with a preliminary version of an extended word processor called Valdocs and an enhanced keyboard design called HASCI, both designed by his company. As you'll be able to tell from this article, I found them both very interesting.

QX-10 Hardware

For its retail price of less than \$3000, the QX-10 (see photo 1) gives you a great deal for your money. It contains a Z80 microprocessor running at 4 megahertz (MHz), 128K bytes of memory (expandable to 256K bytes), two direct memory access (DMA) controllers, one

free serial port (a second one is used by the keyboard), a Centronics-compatible parallel port, six clock-timers, 2K bytes of battery-powered complementary metal-oxide semiconductor (CMOS) memory (to hold certain information even when the computer is turned off), a CMOS clock/calendar, and a light-pen interface. The unit also contains two thinline 5¼-inch floppy-disk drives, each double-sided and double-density, with 40 tracks per inch; each drive holds 320K bytes. The video display, based on the NEC 7220 graphics chip, includes a 32-MHz medium-persistence video monitor and 128K bytes of dedicated video memory (shown as the bottom board in photo 2). The video display will work in either a 25-line by 80-character text mode or a 640- by 400-pixel graphics mode. The QX-10 comes with one of two detachable keyboards—standard-layout or HASCI—more on that later. Finally, the QX-10 has internal space for up to five peripheral cards like those used by the Apple, Corvus, and IBM microcomputers.

QX-10 Configurations

The QX-10 will be sold in two configurations. The first includes (at the time of this writing) the QX-10 as described above, the standard-layout keyboard, the CP/M operating system, Microsoft BASIC, and STOIC (a fast, extensible FORTH-like language). This version is a standard CP/M-based microcomputer for those of us who are comfortable with microcomputers as we know them today.

However, the QX-10 was really designed for the average consumer, who *isn't* comfortable with microcomputers as we know them today. With the software included in this package, the QX-10 becomes (as Ep-



Photo 1: The Epson QX-10/Valdocs system.

son puts it) a *symbol processor* that anyone can use. This configuration of the QX-10 includes the hardware as described above, the HASCI keyboard, the Valdocs software, TP/M (a CP/M equivalent with its own enhancements), Microsoft BASIC, and STOIC. (CP/M may be offered in place of TP/M, but the configuration will probably be very close to the one listed above.)

The Epson Philosophy

Although Epson will certainly sell you the CP/M version of the QX-10, it is far more interested in selling you the unit it really designed—hardware and software designed *in conjunction with each other* to offer both high performance and ease of use. In addition to being a highly integrated word-processing/computer system that offers as much usable processing power as almost any existing microcomputer, the QX-10/Valdocs system is designed to be used without confusion by people with minimal technical knowledge. We've certainly heard that claim before, but Epson has delivered on this promise in a way and to an extent that *no* microcomputer manufacturer has done.

The Valdocs (short for "valuable documents") system described here is designed to manipulate what Epson sees as the four types of symbols that people use: letters,

numbers, graphics, and time. The HASCI keyboard (scheduled to be described next month by Chris Rutkowski in his article "An Introduction to the Human Applications Standard Computer Interface") is shown in photo 3. It is designed with a set of function keys that relate directly to the most common operations people perform on symbols. In addition, these keys are designed to be sufficient to drive any future symbol-manipulating software—that way, the keyboard layout won't change even when more sophisticated software is developed. Table 1 gives a brief description of the HASCI keyboard function keys.

Another aspect of the Epson philosophy is its commitment to ensure that all the parts of a system work together. (What's amazing is that the microcomputer industry has survived while blatantly ignoring this philosophy.) In the QX-10 (with or without Valdocs), the computer, its software, and its peripherals are meant to use each other's capabilities to the fullest. This goes hand in hand with Epson's vision of the dot-matrix printer as the universal standard for printing. Epson has designed a line of printers that act identically and are capable of printing both bit-mapped graphics and text in varying degrees of quality (draft-, correspondence-, and—with some future printer—letter-quality printing).

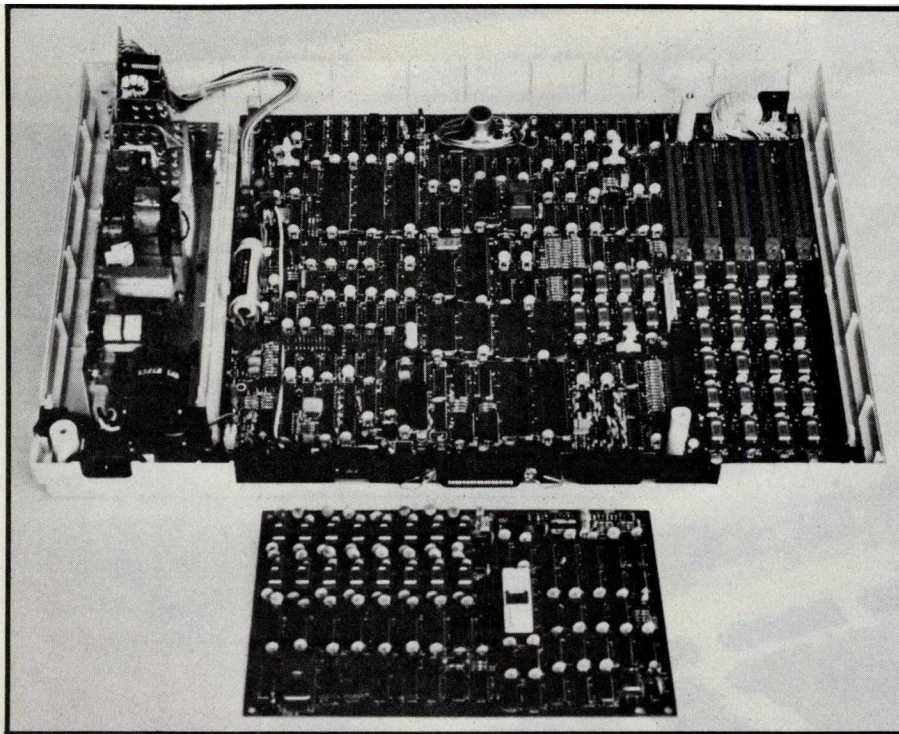


Photo 2: Inside the Epson QX-10. The top unit is the motherboard of the QX-10; the rear of the unit is closest to the camera. The connectors in the upper right corner are the five slots for peripheral cards. The smaller board (below the motherboard) contains the 128K bytes of video-display memory; this card fits on top of the motherboard in the assembled unit.

Valdocs

Epson wants the average person to be able to buy a QX-10/Valdocs system in a department store, plug it in, turn it on, and be able to type in a letter without having to read more than the unpacking instructions. Based on

my inspection of a preliminary version of the Valdocs software, I believe that this is a realistic view of the system. Although I can't do a full review of the software based on the short amount of time I spent with the system, I do want to point out several unique features of the QX-10/Valdocs combination.

Help is available at any time through the HASCI keyboard Help key. An extensive text file of instructions is on the Valdocs system disk and can be read by pressing the Help key. This key gives you a menu of subjects that might be of interest (based on what you were doing when you pressed Help), as well as access to the entire Help file via user-entered keywords. Of course, the QX-10 returns to wherever you were before the Help key was pressed.

The Valdocs symbol processor can manipulate any of the four types of symbols at any time. Text can be entered at any time just as you would in any conventional word processor. The Calc key turns the system into a basic 4-function calculator. Graphics

can be created via the Draw key. The Sched (schedule) key gives you access to a computer-kept appointment book, a built-in clock/timer/alarm, and an event scheduler; all these can be accessed without disturbing the file being edited.

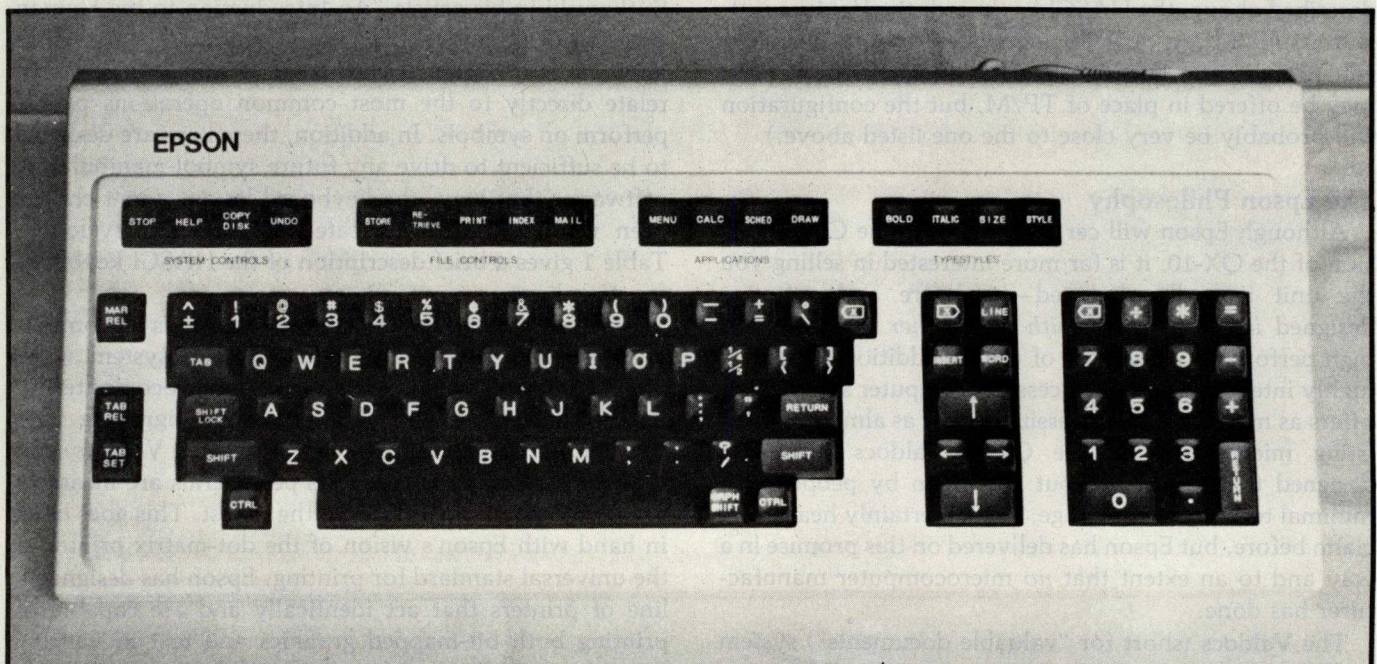


Photo 3: The HASCI keyboard for the Epson QX-10/Valdocs system.

The operation of all keys is as intuitive as possible. For example, when you use any of the type-font keys (Bold, Italic, Size, or Style), the video text image changes to reflect the use of those keys. When you hit the Italic key, all your subsequent typing appears on the screen as italics until you hit the key again to turn italics off. Also, keys like left-arrow, right-arrow, and Delete do their respective functions to words and lines (instead of individual characters) when used with the Word and Line keys.

It is impossible to make any major destructive change to your file without having the change explained to you and being asked to confirm it. In addition, the Undo key allows you to recover from the last major change made to the file.

The Valdocs system supports telecommunications and electronic mail in a way that is transparent to the user (through the Mail key, of course). You can be connected to the remote user by either a modem-telephone combination or a local network (probably the Corvus Omninet). Valdocs includes software that allows you to send and receive mail and access remote bulletin boards and databases.

The Valdocs file system is one example of the kind of levelheaded philosophy that is embodied everywhere in the Valdocs symbol processor. When you store a file, you give it a name of up to eight words—for example, "Letter, 8/13/82, to Bob Jackson; new rate schedule." When you hit the Index key, you can get a listing of all your files in one of several ways—sequentially, alphabetically, or by match of a given word to any keyword in any file. Using the last method of indexing, I could get a listing of all documents that are letters, all documents done on 8/13/82, or all documents that refer to a person named Bob. In addition, all documents are chosen by menu selection (so you don't have to type in a long file name). The utter sanity of this in comparison to file names like L081382.LTR is astounding.

One interesting technical note: to interactively create such a sophisticated word processor with the given time constraints, the Valdocs programmers used the STOIC language (a public-domain variant of FORTH created at the Biomedical Engineering Center of the Massachusetts Institute of Technology and Harvard University) to program the Valdocs symbol processor. It is a testament to the power of STOIC (and other threaded languages) that it was used to create a project of this scale.

New Products

Given the enhancements being planned, it may be that Valdocs is not so much a product as it is a design that Epson will always be improving. Epson plans to have version 2.0 of the Valdocs software available by mid-1983 (updates will be supplied at cost to owners of the QX-10/Valdocs system). Plans are under way for a color interface board and an Omninet interface board (for local networking). Epson is also considering such enhancements as higher-resolution graphics and additional graphics-oriented peripherals, as well as a portable version of Valdocs and perhaps a 16-bit system.

System Controls

- Stop—pauses whatever is occurring at the moment, letting you either resume or abort the operation.
- Help—lets you select and read parts of the disk-based Help file.
- Copy disk—lets you make a copy of a given floppy disk.
- Undo—undoes the last major destructive action.

File Controls

- Store—lets you save what you are working on to disk.
- Retrieve—lets you retrieve a file from disk.
- Print—lets you print a file.
- Index—allows you to see what files are on a floppy disk.
- Mail—allows you to send or receive a file electronically.

Applications

- Menu—gives you access to miscellaneous functions.
- Calc—gives you a 4-function calculator.
- Sched—gives you access to the scheduling functions of Valdocs.
- Draw—lets you draw graphics on the video display.

Typetypes

- Bold—toggles typeface between boldface and normal type.
- Italics—toggles typeface between italics and normal type.
- Size—lets you change the size of the type currently being used.
- Style—lets you change the typeface of the type currently being used.

Table 1: A brief description of the function keys on the top row of the HASCI keyboard.

One enhancement to the QX-10/Valdocs system that Chris Rutkowski did describe is the Valdocs FPL (Forms Processing Language). This is an additional software package that would give the user access to a spreadsheet package, a forms generator that would generate records from keyboard input, and a report generator that would create reports based on a database of records. As usual with ideas from Rising Star, the Valdocs FPL package is actually more than it seems—the spreadsheet and the form into which data is typed are actually the same thing, and a record of data can automatically be created from the spreadsheet. This is a new concept that combines spreadsheet forecasting, online data entry, and database management. It sounds exciting and I am looking forward to seeing it at work.

Final Thoughts

From what I have seen, Epson has created an enhanced personal word-processing system that *can* be (and is more likely to be) used by the person with minimal technical knowledge. Almost every microcomputer company claims that its product can be used by anybody, but many people (even those with technical knowledge) still have trouble getting started in personal computing. As microcomputers become more powerful, easier to use, and less expensive, the claim that "anyone can use it" will become true in a fuller and fuller sense, making previous claims seem naive and hollow. Still, the Epson QX-10/Valdocs system may become the first microcomputer that "really" fulfills that claim. BYTE will report to you again when the final unit becomes available. ■