QX-10 FROM THE BEGINNING TO VALDOCS 2.0

By Jim Hansen

In April 1983, I reviewed the QX-10, a pre-release version of VALDOCS, and the FX-80 printer, in a three part cover article for the April edition of *Microcomputing* magazine.

In that review I gave the QX-10 excellent marks for its overall design. The keyboard and screen display were singled out for exceptional comment.

The QX-10 is probably Japan's most successful personal computer, and coupled with the interest it and VALDOCS 2.0 has created (the original review, reprinted for Epson, is still generating mail to the author), it is fitting that we take another look at what has happened to the computer, its software, and and how Epson is coping with the 16-bit computer competition.

Can this general-purpose, Z80A-based imported computer survive the 16-bit personal computer onslaught?

Has the American software base written exclusively for Epson lived up to its claims?

After using a QX-10 for nearly two years, is it still the computer described in the original review?

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COOK'S TOUR OF QX-10

The QX-10 is a Z80A-based computer system built in three units: a detachable keyboard, an electronics case, and a detached monitor.

Internally, it is equipped with 256,000 bytes (256K) of program memory; 128K of video display memory; two double-density, double-sided disk drives, giving about 380K of storage each; a serial RS-232C interface; and a Centronics-compatible printer port.

The QX-10 monitor features a matted screen with a green phosphor. It normally displays 25 lines of 80 characters each (up to 132 characters per line can be shown when using one of the "compressed" character fonts), and has a graphics resolution of 640 dots by 400 lines, double that of the IBM PC.

The HASCI keyboard features 108 keys.

Two versions of the QX-10 were initially introduced. The VALDOCS version (described above) was priced at $2995 including CP/M, Microsoft Basic Release 5, and the newly introduced VALDOCS integrated software operating environment. A reduced price CP/M version of the QX-10 was also available with only 64K of memory and an ASCII keyboard; this version was supplied with CP/M and Basic, but not the VALDOCS operating environment.

My original comments about the QX-10 hardware were nearly all positive. I remarked the computer was "superbly designed", that the keyboard and screen were "without peer," and the computer should provide "years of convenient, pleasant service."

Negative comments noted the lack of a dimple on the "5" key in the numeric keypad, and the vertical cursor movements did not automatically repeat. Happily, both of those "glaring" deficiencies were corrected; the new HASCI-2 keyboard has the dimple, and vertical cursor controls repeat when the control key is depressed with them.

MINOR CHANGES SINCE INTRO

The CP/M version of the QX-10 has been discontinued in the United States, although it is the mainstay of the Epson marketing effort in Europe, where VALDOCS, until this spring, had not been sold. Rumors making the rounds indicate that prior to the discontinuation of the CP/M computer, VALDOCS versions of the QX-10 were outselling it by a factor of greater than 10 to one.

That, perhaps, speaks somewhat highly of the market success of the VALDOCS software which requires the full QX-10 memory capacity to operate.

Except for manufacturing updates internal to the QX-10, few apparent changes have been introduced over the last year. Probably the most noticable change was in the case molding around the reset key. The newer QX-10 cases protect the hidden button to the point where it is hard to depress even with a pencil.

The HASCI-2 keyboard, released about the middle of this year, replaced the original HASCI version. This keyboard has two minor layout improvements over the original HASCI version.

An "edit" key was added in the applications section, and a numeric sign inversion key was placed in the calculator keypad. The edit key allows direct selection of the VALDOCS 2 editor. (It is non-functional on VALDOCS versions 1.14 through 1.19.)

The HASCI-2 keyboard is now standard with new QX-10 computers, but can be purchased ($250) separately by users desiring to replace the original version. (Most dealers, is seems, are not aware of this keyboard. Contact Epson directly, if necessary, for further information.)

Physically, the HASIC-2 keyboard is thinner and lighter than the original keyboard. The keys have a wider top surface and exhibit a slightly heavier "feel." I personally have no preference for either keyboard and find both very "typeable". Some users claim they can type faster with the HASCI-2 version, and others prefer the narrower profile keycaps of the original because they tend to hit double keys on the HASCI-2 keyboard.

NEW HARDWARE

In spite of published specifications for the input-output (I/O) interface section of the QX-10 (see the QX-10 Technical Manual), not many option cards for this computer have surfaced during the last year. In fact, all of the cards mentioned below have come on the market since January of 1984. The following list of hardware accessories for the QX-10 is not complete, but does show that several organizations are now independently developing products for the computer.

INTERNAL MODEM

Comrex International of Torrance, CA, began shipments of the CR-103 direct connect 300 baud modem card ($179) this spring. The CR-103 card was recently offered by Epson as a part of a QX-10 package promotional campaign earlier this year. All indications are the card is reliable in use, especially when used with the VALDOCS Mail system.

Installation of the CR-103 is easy, just plug it into any slot in your QX-10 expansion area. The cable normally going to your telephone is plugged into either of the two modular telephone jacks on the back of the CR-103, and the extension cable (provided with the CR-103) goes from the other jack to your telephone. A simple five minute installation. The CR-103 can dial with either tone or pulse dialing.

An internal loudspeaker monitors the phone line until a connection is made, then is automatically muted, in typical modem fashion. The sound is a little muffled by the QX-10 case, as would be expected, but is adequate for the purpose.

Both CP/M MODEM7-like software (supplied on a disk that comes with the CR-103) and VALDOCS electronic mail software provide full, integrated support for the CR-103. The VALDOCS MAIL subsystem is more refined, comprehensive and automatic than the CP/M software, but both offer "talk" and data transfer modes for use with bulletin boards and other computer systems. The Christenson error-correcting communications protocol is used for file transfer.

The CR-103 is a medium performance direct-connect modem. It works well for coast-to-coast communication with both bulletin boards and other QX-10's using the latest versions of VALDOCS 1.18 or 1.19 MAIL.

Telecommunications over the phone network can provide both pleasure and frustration. I have found no modem seems to be able to work reliably over MCI or SPRINT (at least not from my home in New Hampshire). Other similar "cheap" telephone services often have the same problem. (Could it be that Ma Bell gives good lines for the money they charge?) Users of the CR-103 and other low cost modems will be more sensitive to poor telephone connections than higher priced modems, but rest assured that no modem can escape a bad telephone line.

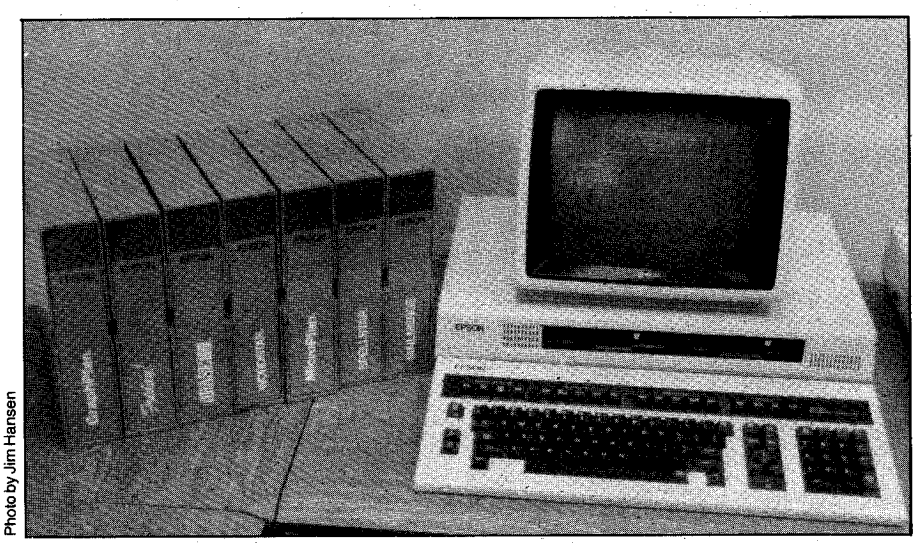


Photo by Jim Hansen

The full collection of "HASCI enabled" software. This assortment of software was specially modified to take advantage of the QX-10 keyboard.

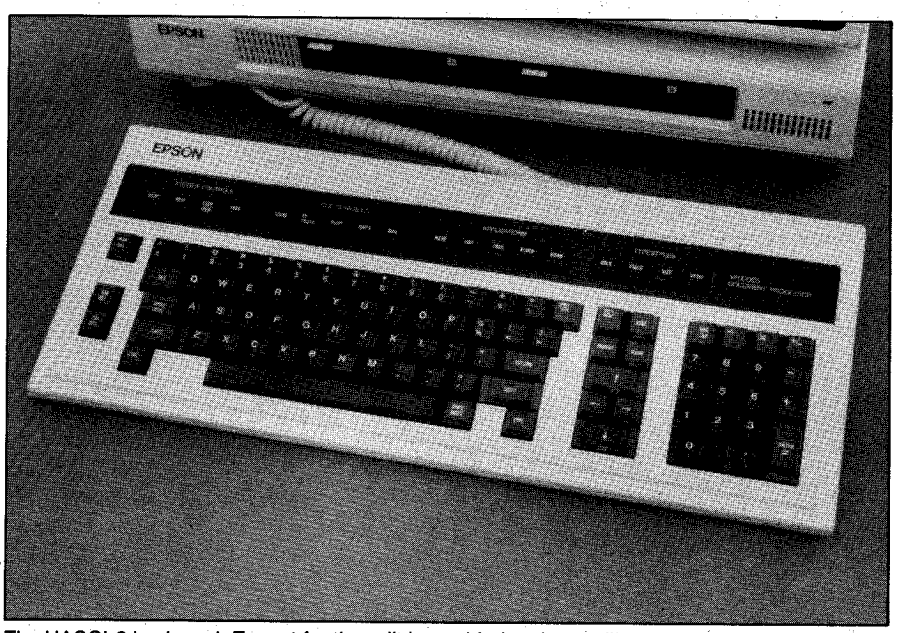


Photo by Jim Hansen

The HASCI-2 keyboard. Except for the edit key added to the applications area and the numeric sign inversion key to the calculator keypad, the layout is identical to the orginal keyboard.

If you have bad phone service, you should try to test any modem, including the CR-103, before you buy, but if your phone lines are good or even average, the CR-103 will provide good service.

HARD DISKS

At present there are two sources of hard disks compatible with the QX-10 computer. COMREX markets the ComFiler, a 10 megabyte hard disk ($2295) for the QX-10. The ComFiler is fully supported by both Epson releases of QX-10 CP/M and all versions of VALDOCS software.

This drive is attractivly packaged and matches the QX-10. A well-written manual guides installation and formatting (which takes some time). This hard disk system is reliable, and radically speeds disk access. Speaking from experience, yes, it is possible to fill up a 10 megabyte disk! My observation is hard-disk storage capacities are nice, but the prime benefit is speed of access.

One of the prime user responsibilities with a hard disk is to ensure you have backup copies of all important files for recovery after the eventual failure of the hard disk unit itself. Backing up files from a hard disk is such a pain it is often put off past prudence, inviting disaster. Such disaster will strike when least expected or desired. (VALDOCS 2.0 provides automatic hard-to-floppy disk backup, relieving a lot of that headache, but more on that later).

Quality Computer Services of Metuchen, NJ makes a complete line of hard-disk systems for the QX-10. Various capacities are available through 84 megabytes ($7999). I have been using the model DSK-63 (20 megabytes, $2799) for over a year without a hitch. QCS also offers the DSK-63 with a 5 megabyte removable cartridge ($4099; cartridges are $139 each). The removable cartridge significantly reduces the time it takes to back up important work, and is especially convenient when the amount of work to be backed up is greater than can be held on one or two floppies.

Quality Computer Services, who has been in the hard disk business for nearly four years, makes a reliable product which, by the byte, is very cost competitive. Most of the VALDOCS software was written on QX-10 systems equipped with QCS hard disks, assuring absolute compatibility. Quality Computer Service's manuals are technically intimidating, and installation software is exceptionally unfriendly. They definately not written for civilians.

(Even unwary technocrats have lost all their data stored on these disks because QCS's utilities have blindly commenced operation without first checking the disk or verifying the operation with the user. Fortunately, once a QCS disk is formatted, you will probably never use their software again.)

Although the installation of a hard disk in the QX-10 amounts to nothing more than plugging in an option card, new computer users should probably have their dealers install, format, and setup QCS systems before taking them home.

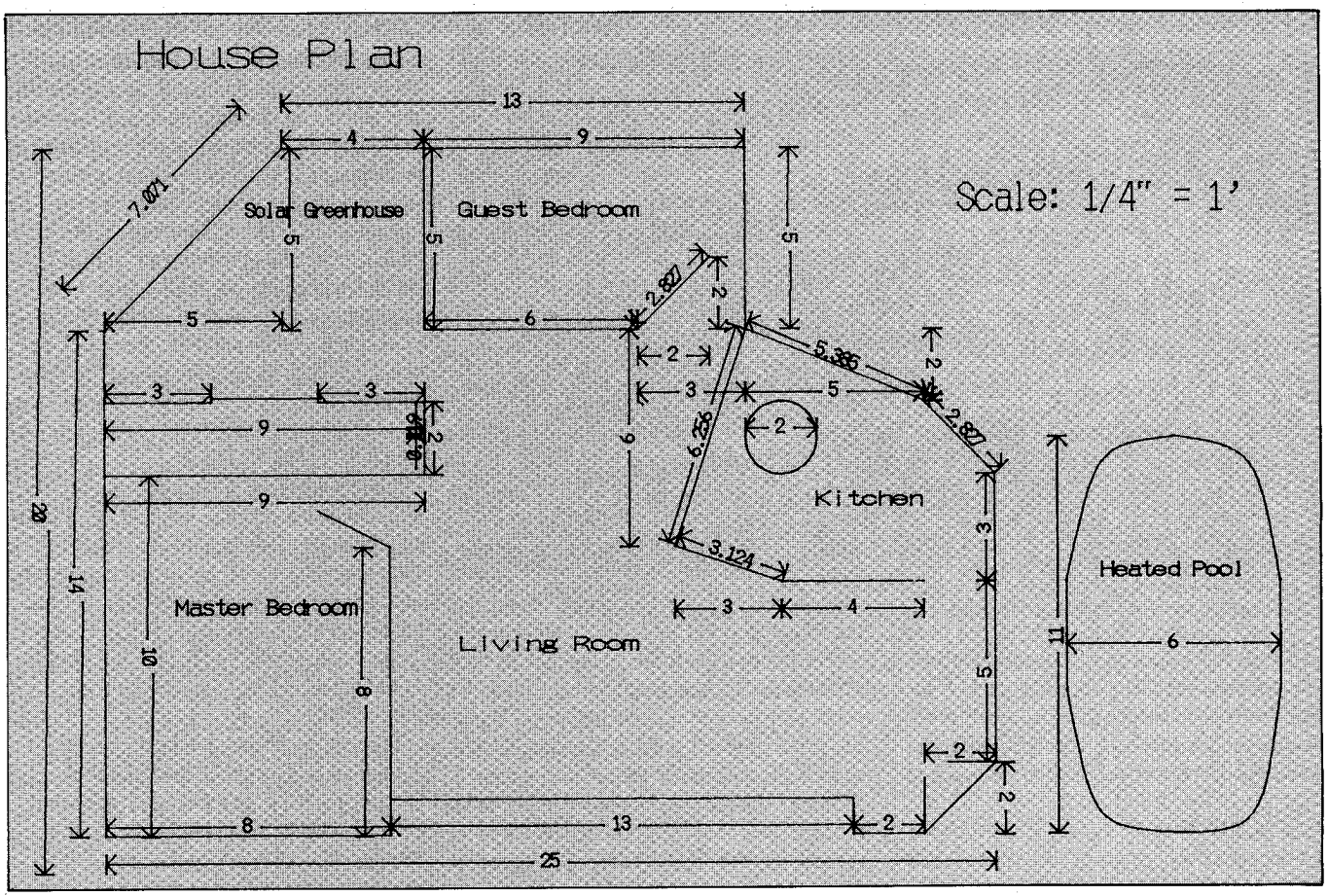
TALKING BIG BLUE

Titan Technologies Inc. of Ann Arbor, MI offers the QX-PC card which allows MS-DOS of IBM fame to run on the QX-10. This $795 option card includes 192K of memory, expandable in 64K increments to 512K. The QX-PC is actually a card with a "piggy-back" memory array, and includes an 8088 processor and ROM.

Operation of the system is straightforward. Once the QX-PC is installed in the QX-10, a special disk is used to boot up the 8088, completely disabling the QX-10 Z80A processor and QX-10 memory. The memory on the QX-PC card can be used as a RAM disk when normal Z80A/QX-10 operation is selected.

Many (but not all) of the popular 8088 software packages running under MS-DOS — such as Lotus 1-2-3, Multiplan and other programs not using PC graphics — can be run with the QX-PC. Unfortunately, Microsoft Basic, as applied in IBM-land, cannot be run with the QX-PC since much of the Basic code itself is in IBM ROMs, and because of obvious hardware differences between the Epson and IBM graphics screens. As of early summer, no version of Microsoft Basic was claimed to run with this option card.

The QX-PC card has not been promoted or sold heavily, and the word is an updated version is in the works. If you are interested in IBM compatibility, you should check with Titan before buying. The main reason most people would need this card would be to gain access to some of the newer 16-bit software, not available or practical when using CP/M.



A plot of a house plan drawn in less than 30 minutes time using Valdraw. This CAD system makes it easy to draw architectural images. At present it can drive only the four-color Epson plotter and the ComScriber ploter from Comrex. This picture was drawn by the ComScriber.

One example of 16-bit software made impractical when translated to the 8-bit world is Multiplan. Available in both CP/M and MS-DOS versions, this spreadsheet provides only about 12K of user memory when run on CP/M-based computers and is thus not practical for most serious applications.

SemiDisk is a memory card marketed by SemiDisk Systems of Beaverton, OR, that emulates a 512K floppy disk ($995). In addition to the blazing speed this hardware adds to the QX-10, a printer spooler is included. (A spooler accepts entire files to be processed, then returns control to the main computer while the processing takes place.)

The speed improvement is anywhere between five and 10 times quicker than when using floppy disks. For example, when using the PeachText mailing list manager, a sort of about 1500 names takes over an hour when using a ComFiler hard disk. Using SemiDisk it takes about 10 minutes.

INTERNAL SPEECH SYNTHESIZER

Universal Computer Products of Irvine, CA, manufactures the QXSM-1 speech synthesizer ($295) option card for the QX-10. This card requires only a loudspeaker to be fully functional. Based on an Echo technology speech synthesizer module, it can create speech and sound effects simultaneously without interference.

This synthesizer can be driven directly from Basic or system-level software.

I had a chance to use a QXSM-1 and compare it to the Votrax Personal Speech System and Type 'N' Talk units. I found the Votrax synthesizers easier to understand.

While both systems sound like Robby the Robot with a cold, the way Echo handles speech timing make some syllables short, others long. The result is irregular speech, shifting speeds in the middle of words. I agree with several others who have heard this synthesizer and found it difficult to understand at times. But once your ear has been trained to this synthesizer, apparent intelligibilty should increase.

The QXSM-1's text to speech accuracy is around 90 percent for normal speech, about the same as the Votrax Personal Speech System. It can be programmed for both inflection and pitch. The QXSM-1 excels in combined speech and sound effects. Once intelligibilty has been improved (it is being worked at this writing), it will make a good choice for use with the QX-10.

OPTIONS FROM EPSON

Epson Japan manufactures other cards for the QX-10 available internationally that have not been marketed in the United States:

- A serial interface card which provides two additional serial RS-232C ports.

•A two channel fiber-optic interface card for use in networks or industrial applications.

•An IEEE interface card to interconnect the QX-10 to test, measuring and scientific equipment.

•The MF-FONT card which, in conjunction with MF-CP/M and MF-Basic, provides additional fonts for display and printing. (MF stands for "MULTI-FONT". The MF versions of CP/M and Basic are distributed only overseas, although MF-CP/M is available in Canada.)

•A light pen for the QX-10. This plugs directly into the light pen port and is available in Canada ($779 Canadian).

COLOR ON THE QX-10

A color option for the QX-10 was introduced in Canada in March, 1984, and hopefully will be made available in the United States by year's end. The option consists of a new video controller (which replaces the normal monochrome controller riding piggy-back on the QX-10 main electronics card) and a special high resolution RGB color monitor.

These options are expensive: the Canadian price is $1279 for the color video-controller and $1319 for the color monitor. However, QX-10 color resolution is the same 640-by-400-pixel resolution as regular QX-10 systems, making the color images and quality state of the art in personal computers today.

Software support for the color QX-10 system is provided by both VALDOCS 1.8 and 2.0 releases, RSI Basic, Valdraw, Valpaint (described later), and MF-CP/M, available in Canada at $249 (Canadian).

The color QX-10 electronics case and keyboard are, of course, unchanged, but the monitor is a little larger than the existing monochrome unit. The colors displayed brilliant and well saturated. Display speed is somewhat slower than the monochrome QX-10 screen because there are no "hard" character fonts in a color system — everything is displayed as a graphics image.

The QX-10 color controller provides 128K of memory for each of the primary colors (red, blue and green), triple that of a monochrom QX-10. Data displayed in a primary color will go on the screen faster because other colors are made by writing into more than one color memory to get a color mix, slowing things down a little.

OLDER BUT STILL PEERLESS

After nearly two years of heavy text processing (including a book, several major technical manuals, and numerous magazine articles), I can report the QX-10 keyboard and screen are still *without peer*. I am not aware of any other computer or computer terminal that will allow a person to use it for 12 hours or more at a time (as I have on occasion) without becoming half blind in the process.

I can also report the reliability of the QX-10 in my case has been flawless. I have not experienced a single hardware difficulty (except those caused by the somewhat unpredictable reliability of power in my hometown). I have not lost a single character of text out of the several million typed into my system. And VALDOCS 2.0 now prevents even these types of losses.

CP/M AND TPM

The QX-10, being based on the Z80A, runs CP/M and Rising Star's TPM operating system. "Upwardly" compatible from CP/M, TPM can run both CP/M 1.4 and 2.2 software. The Rising Star operating system is supplied (and required) for use with the VALDOCS.

The QX-10 was supplied by Epson with CP/M A2.21 until March of 1984 when version B2.20 was released.

Very briefly, the B release uses two banks of 64K memory (unused in CP/M A2.21) to provide a 112K ramdisk (drive M), provides an automatic screen dump (activated by typing control-print), and considerably speeds disk access and program loading. A utility supplied with the B release allows the QX-10 to read and write several disk formats (listed in table 1). Other user conveniences, too numerous to mention here, are also provided. Unfortunately for CP/M B users, only the ComFiler hard disk can be used with CP/M B because Epson provided no support for the QCS drives.

The original TPM-II operating system supplied with VALDOCS 1.14 through 1.19 operating environments has evolved into TPM-III for use with VALDOCS versions 2.0 and above. Major file handling speed improvements, bank switching, and hard disk support for both ComFiler and QCS hard disks has been incorporated.

Format	Tracks	Sectors/Track	Bytes/Sector	System Tracks
QX-10	40	10	512	2
QX-10	40	16	256	2
MF-CPM	40	16	256	4
IBMS (CPM-86)	40	9	512	2
IBMD (CPM-86)	40	8	512	2

Table 1. Disk formats provided by Epson's CP/M B2.20 release. Two other similar utility programs (ALTDISK from Rising Star and UNIFORM from Micro Solutions) can be used to read and write data from more than 20 different computer systems. Operation of all of these programs is simple: You select the disk format desired, and until it is changed, data can be read and written as if the disk came from another QX-10.

Title	Use	List Price
Wordstar	Text Processing	$495
GraphPlan	Graphics Spreadsheet	$295
MicroPlan	Financial Modeling	$495
Friday!	Electronic Filing System	$295
dBASE II	Data Base Management	$700
Spellstar	Spelling Checker	$250
Mailmerge	Mailing List Manager	$250

Table 2. A list of QX-10 software customized by Epson for the QX-10. These versions require Epson's CP/M B2.20 (or later) operating system.

TPM-III provides many of the same functions of CP/M 3.0, but is considerably more powerful on the QX-10 since it interfaces all of the VALDOCS video driver software, RSI Basic, and more, directly and specifically to the QX-10. TPM-III is a "no compromise" operating system intended for use with no other computer. As such it is very fast. TPM-III, like its predecessor TPM-II, is software compatible with all versions of CP/M through CP/M 2.2 programs at the system call level.

PEACHY SOFTWARE

When first introduced, Epson sold the Series 9000 software from Peachtree Software Inc., including PeachText (a word processor), Spelling Proofreader, PeachCalc (a spreadsheet), Mailing List Manager, Telecommunications, and the Calendar Management System. This minimal collection of software provided a small library of proven CP/M-based software to get CP/M users off the ground as quickly as possible.

Epson has continued to offer new versions of this software (the "5000" series), adding various other business packages also available through Peachtree. Most recently Epson has brought out the "Executive Tool Kit," a collection of customized software currently popular in several business areas. These have been customized to run with the HASCI keyboard and require the CP/M B release to operate.

The HASCI customization allows use of the various pre-labeled function keys (Store, for instance, causes a file to be stored.) and includes an interface to the internal ramdisk (drive M). This software, listed in table 2, is published in blue ring binders a little larger than the usual IBM-sized manuals. Except for the keyboard customization, the software packages are no different than the standard CP/M versions. The retail price for the HASCI customized software is about the same as for the equivalent CP/M version.

RUN ALMOST ANY CP/M

It is possible to buy nearly any CP/M-based application program configured for the QX-10.

For example, Lifeboat Associates in New York City reports it has over 200 business and scientific programs available for the QX-10 computer. (It does not, as a rule, carry games programs.)

When buying 16-bit software configured for CP/M, be sure to check it carefully before buying. Some of these programs are so large, there is no room for data, making them impractical. One such program is Multiplan, which is so large only 12K of memory is left to hold the spreadsheet data. This is not enough room for even a small spreadsheet useful for most business applications.

WHAT YOU SEE IS WHAT YOU GET

VALDOCS (VALuable DOCumentS) is a software operating environment providing an elegant, but simple means of controlling a computer.

VALDOCS has three planned levels of development. Version 1, distributed during the past year, demonstrated the overall design concept of integrated software and the HASCI keyboard. It was written in a collection of languages including STOIC, C, FORTH and assembly, and adapted, in some cases, from existing software. The 1.18 text editor, for example, started life as a version of the ZTEL editor.

The software provided in version 1 included one of the first successful "what-you-see-is-what-you-get" text editors; an electronic mail system; a graphics package allowing simple pie, bar, and other graphs to be drawn with data entered from the keyboard; a calendar-scheduler program; and a four-function calculator.

A collection of keyboard function keys allows various file functions to be activated, disks to be copied, and standard CP/M programs to be called up and run outside the VALDOCS environment.

Without going into very much detail, VALDOCS version 1 has bee sucessful. Reviews of VALDOCS, with one known exception, have praised the concept, but almost all mentioned that the system seemed slow. (One reviewer actually went on public record saying such a system would be ponderously slow and unusable until 16 or 32 bit computers were used.)

The VALDOCS version 1 editor is slow by many standards. A what-you-see-is-what-you-get editor is difficult to design and implement because the screen must be treated as a graphics tablet. Characters are actually plotted on the screen, a much slower process than normal display techniques.

When the screen display is scrolled up a line, the entire screen has to be replotted. This takes time, especially in an editor not intended to solve the myriad of other problems associated with this type of operation. Using the version 1 editor, it is possible to "out type" the screen, especially if special characters or underscore are applied.

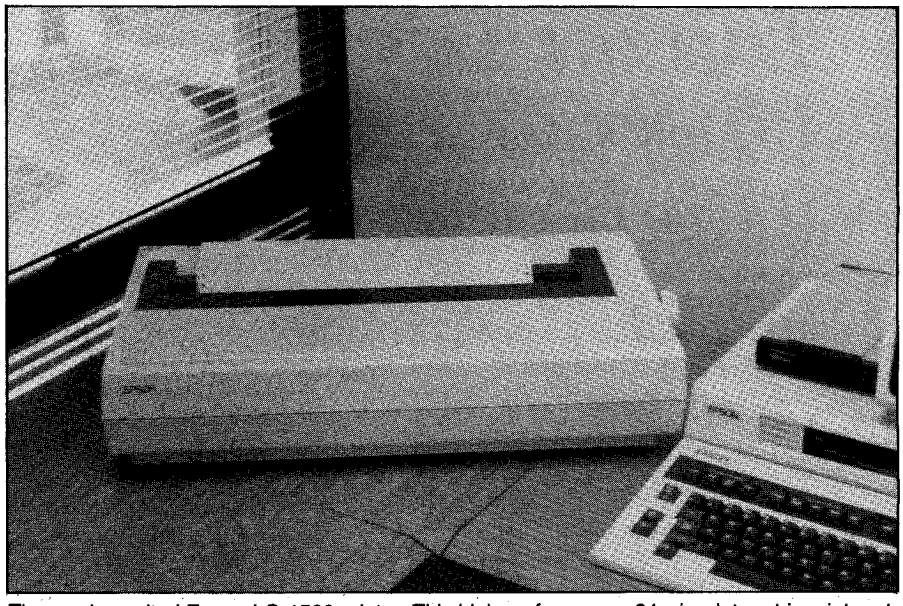


Photo by Jim Hansen

The much awaited Epson LQ-1500 printer. This high performance, 24 wire dot-matrix printer at last provides printer performance matched to that of the QX-10. Several print modes are available —fast, lower quality for draft copies, and slower speeds providing typewriter-like print.

Searches for text using the VALDOCS 1.18 editor can be excruciatingly slow. This is because only a small part of the actual text is kept in memory; most is kept in a temporary file on the data disk.

The speed of the rest of VALDOCS version 1 is fairly respectable, although it sometimes seems slower than other systems. For example, I timed how long it takes to store a document from the editor, call up an application program, then reverse the process, returning to the editor and calling up the same document to edit.

The results are interesting. It takes VALDOCS 1.18 20 seconds to accomplish these tasks, but, using WordStar and CP/M on the same QX-10, it took over 30. Somehow VALDOCS was about 30 percent *faster*, yet it *seemed* slower. Why?

It takes several computer interactions using WordStar and CP/M to accomplish the above task, but when VALDOCS is used, you merely poke the STORE button, hit a carriage return to save the document under its old name, poke the MENU key, find the application from the list on the screen, run the cursor to it and hit return. With CP/M, you must constantly stay attuned to what is happening, and interact with the computer each step of the way. This occupies you most of the time, making it seem quicker.

In the final analysis, VALDOCS 1, while slow in some respects, was (and is) quite usable by anyone who can read, type, and has an IQ over room temperature. And it comes free with the QX-10. VALDOCS 2.0, just coming on the market, is not just a warmed over edition of version 1.

VALDOCS'S SECOND COMING

Version 2 is fast. And it comes with a spreadsheet as easy to use as the editor; a vastly improved business draw package that automatically plots multiple data sets on bar, pie, line, and scientific graphs directly from the spreadsheet; an expanded mail program; and a collection of other very useful application programs.

VALDOCS 2.0 comes on two disks. The first, called the "load" disk, places support programs into memory that are always there to support the various other VALDOCS system programs. After this information has been read into memory, VALDOCS asks for the "run" disk. This disk is equivalent to the old "system" disk used in version 1. The entire two-disk loading process takes less time to bring up than version 1 did.

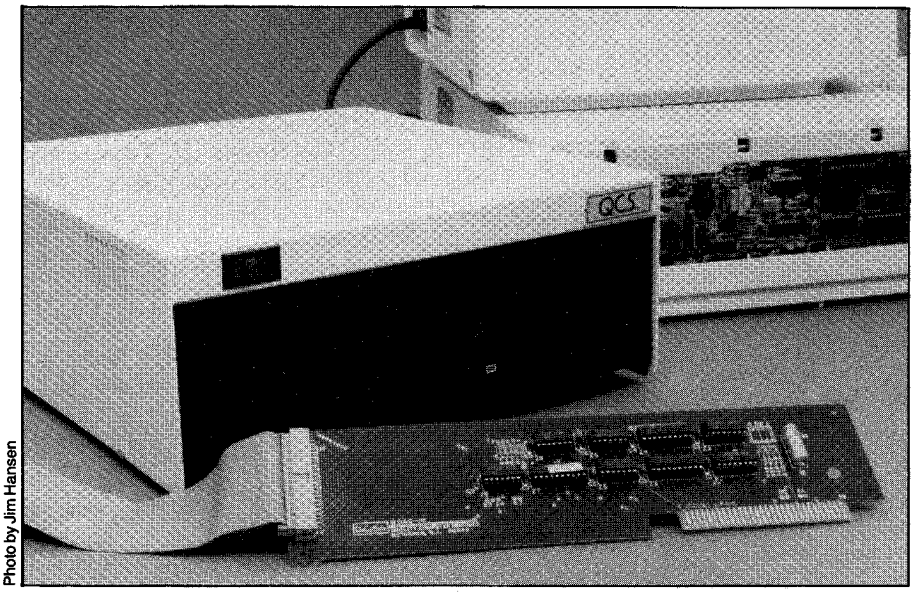


Photo by Jim Hansen

The QCS DSK-63 hard disk, showing the controller board. Installation of a hard disk is nothing more than plugging the controller board into a slot in the QX-10 expansion area. Formatting and installing software the first time is a somewhat trying experience using the QCS documentation. The Comrex installation manual is well done and easy to follow.

The VALDOCS 2.0 editor displays characters on the screen with little or no "rippling" apparent when a full screen scrolls up a line, all the while displaying 16 fonts including underscored, compressed, expanded, super, and subscripted characters. The type-style keys are all functional in version 2. The style key selects normal, super, or supscripted characters. The size key changes the character sizes from the normal 10 characters to choices of 5, 10, 12, and 15 characters per inch. The cursor changes shape and size to indicate the size and style of the character set being selected.

The italic and bold keys select italic and bold versions of the characters being typed. Underscoring is done the same as on a typewriter: Backspace under the words to be underscored with the edit arrow keys, then type the underscore character. Simple and very slick.

Headers, footers, and many other features not included in the version 1 editor have been added, and more is on the way. It is claimed the version 2 editor keyboard can keep up with 450 word-a-minute typists. I don't know if this is true, since I can't type that fast. What I can tell you is there there are no more pauses necessary while the screen is repainted (that is handled in background, between keystrokes, if necessary.)

The version 2 editor also updates temporary disk files automatically, within three seconds after the last keystroke. This comes close to eliminating loss of data due to a power outages or accidental shutdown. If power is lost while editing something, then restored, the QX-10 will initialize to the editor with the cursor and text being processed displayed as they were at the time of the failure. It takes no more than about five seconds to store a file of any length. If a suitable hard disk is attached, version 2 files can be up to about 8 megabytes in length.

Many graphics features have been incorporated into the version 2 editor. The screen now has a ruler at the bottom with a separate cursor showing the exact character position being typed. This is an especially welcomed feature, since it is now possible to see exactly where margins, tabs, and the cursor are located.

Margins are now set by horizontally positioning a vertical bar running from the top to the bottom of the screen. The bar, representing the new margin position, clearly shows where the margin lines up in relation to both text on the screen and the ruler mentioned earlier. (You can still enter margins the old-fashioned way, by typing in the settings to be used in inches but that seems a little "klunky" compared to the graphic method.)

Page settings are done by adjusting the size of a box. The relative shape of the box can be seen against horizontal and vertical rulers, with (of course) a digital readout.

All aspects of editing have been *drastically* speeded up. It is unlikely speed will be mentioned again as a problem with VALDOCS.

The setup program in version 2 allows selection of the program to be run when the QX-10 is turned on. (Version 1 always initializes with the editor.)

This allows you, for example, to select MAIL at the end of the working day. If power should fail in the middle of the night, your QX-10 will start up in MAIL automatically when the lights come back on, ready to pick up anything coming in, or to send anything you may have scheduled for delivery that night.

A host of other system variables are selected here as well. This includes printer type, modem selection, any plotters or mice being used, whether menu windows scroll up and down or "pop" in, and more.

Other features make VALDOCS version 2 a genuine delight to use.

For example, the menus remember your last choices. When you have been through the menus in a particular application once, you can simply press the return key on successive passes through them unless a new choice must be made.

In MAIL, uncompleted calls cause a "redial last number" choice to be automatically added to the dial menu; COPYDISK allows you to browse through a directory selecting individual files to be copied, then automatically copies all your selections in a single pass, freeing you to do something else while the copy takes place; an automatic hard disk backup option is also provided.

Literally hundreds of other similar "nit-picking" refinements that no one will ever notice (until they are pointed out) have been put into VALDOCS version 2.

I have timed how long it takes to switch from one application to another using VALDOCS 2.0. The longest time I found was about 15 seconds, the shortest was around five. This was with a QX-10 and a QCS hard disk. (It takes a little longer using a floppy-based system.)

Here is an example: Select COPYDISK. After the COPYDISK menu is displayed, press MAIL. As soon as the MAIL menu shows up, press COPYDISK. Roundtrip time: about 14 seconds on a floppy-based system, 7 seconds flat with a QCS hard disk. (The floppy-based system times will be faster by the time you read this . . . my prototype software had not been "optimized" yet!)

PROGRAMS INSIDE VERSION 2

For those of you who have not seen the Epson keyboard before, all of the VALDOCS programs are called up by single function keys. The legend on the keys, naturally, describes the function to take place.

Probably one of the handiest of all of these keys is the undo key. It is used in the editor to erase the last change.

It's also used to change direction when making menu selections. You can go to a previous menu to change a selection, then "page" to your original position by hitting the return key.

In VALDOCS if you don't like something you see or just did, hit undo. If you want to stop something, press stop; if you can't figure something out, type help. There is over 50K of help-file data included on the version 2 disks. All of it has been carefully designed to be truly helpful and complete.

The other VALDOCS keys call up the functions listed below. These descriptions have to be brief, so only some of the more important updates and changes are noted.

HELP. There is now more help available, and it is faster than ever before. Nearly every menu screen — and there are hundreds of them — now have help installed. The only exceptions are those menus which are clearly self-explanatory.

COPYDISK now features both multiple and single-file copies. Files to be copied are chosen by use of the cursor and return keys; file names are no longer typed. An automatic hard disk backup, several other disk copy modes, and utilities are now provided.

STORE and **RETRIEVE** are incredibly fast, typically taking less than five seconds to complete. Speed is independent of the length of the file.

PRINT now runs fully in background as a spooler. It has improved page numbering, heading, and margin controls. It processes data, so it prints correctly for any of the Epson and Comrex printers sold in the United States. It also has provisions for "others" to be used as well. Options selected in "setup" cause plotter data to be automatically output when a plotter is in use for Valdraw or Draw. Otherwise, graphic data is formated for various Epson printers, selected from the printer list in the setup program.

INDEX can provide cross-referenced listings of VALDOCS files by each of the 16 words allowed for file names; the speed of the indexer is no longer a function of the number of active files. It runs at the same speed regardless of the number of files on a given disk.

MAIL. The electronic mail system now answers a ringing phone regardless of the current use of the QX-10. It also holds calls active while checking things outside of the MAIL program, allowing you to check files already on hand.

Multiple files can be sent and received in a single call and received files can be stored into either VALDOCS or TPM much more quickly than before, due to improved menus and disk access speeds.

Anything sent to the QX-10 screen during during a session with another computer or person can now be automatically saved in a disk "capture" file. This file can later be edited and printed as if it were an ordinary VALDOCS file. The mail address book, which holds names, addresses, and telephone numbers of people and computers you frequently call, is greatly speeded up, and access to any entry is nearly instantaneous.

Selections can be made in setup to change what is shown on the screen when mail is first entered. (You can have the in- or out-basket logs, names from the address book, or nothing shown on the screen.)

The cards in the address book are set up so each entry in the book can be a part of several different mailing lists. (When mailing labels are printed from the address book, you can specify which of several mailing lists are to be printed. Names in the address book can appear on all, some, or no mailing list.

MENU is the gateway key to VALDOCS and CP/M applications programs and the TPM III operating system. It has undergone a few menu changes, but is otherwise about the same as in Version 1.18.

CALC now enters Valcalc, the spreadsheet program. Valcalc supports an extremely large array (1 through 999 and A through ZZ). It offers most all the standard spreadsheet features, but with vastly simplified operation. (Most operations are similar to the VALDOCS editor.) Simple menu selections requiring perhaps five or six keystrokes, for example, are all that is required to widen a text column.

All the usual spreadsheet math and trigonometric functions are available; user-defined functions can be added and saved in a "library-like" system that operates under a menu. Up to eight sets of data generated by Valcalc can be taken directly to Draw for graphing. All the editor's "power failure" protection is provided in the spreadsheet; it remembers where you were when the lights go out, and returns you there when they come back on.

Numeric data to be placed in vertical columns can be entered "calculator" style, with values separated by the "+" and "-" keys. When the last number has been entered, the "=" sign causes the "formula" generated by the entry process to be automatically entered in the cell below the last number entered, and the summation value calculated and displayed. I found this to be a most convenient feature, and one wonders why it hasn't been used in other spreadsheets.

Photo by Jim Hansen

The Comrex ComFiler 10 megabyte hard disk. The ComFiler, although lower in capacity than most QCS hard disks, is slightly faster.

SCHED No major changes have been made to this program. Sched provides an "electronic" desk calendar with notepad.

DRAW now allows up to eight sets of data to be simultaneously drawn on pie, bar, line, and scientific charts. Draw automatically scales all data, and allows plenty of options for every type of chart.

For example, you can set the width and overlap of the bars in a bar chart. Automatic default values give very presentable charts, if you are too lazy to change them. Graphs can instantly be changed from one form to another — say from line to bar chart — by just changing the "graph type" entry in a menu.

The size and position on the screen of the chart can now be adjusted. (Version 2.1 is scheduled to allow automatic inclusion of these graphs in a text file. Once inserted in a file with the editor, it will be printed as a part of your report.)

The charts prepared with Draw can be "painted" with Valpaint to add shading, hand drawn sketches, and notes on top of the computer generated graphics.

MORE 2.0 APPLICATIONS

Several VALDOCS-related applications programs will become available with the initial VALDOCS 2.0 release. Some of these will be bundled with the version 2 release, others will be sold as separate programs.

MATRIX allows redesign of the graphics character set. These are the characters typed whenever the graph-shift key is depressed. The redesigned character sets can be made up of foreign characters, new graphic characters, or any symbol you wish to display on the screen or print using Epson printers. It is possible to have two complete character sets — the normal and a self-designed set — available under graph-shift usable at the same time. All such characters can be printed when using Epson dot-matrix printers.

DEFKEY allows the function keys (those above the main typing section, such as the store, retrieve, and print keys) to be defined as functions. These can be activated in both the VALDOCS and TPM environment. The functions can be built up to perform, automatically, several complex functions, such as calling up a utility program, entering control arguments, then exiting the program after it has performed its task.

SHOWPIC displays a list of picture files, much like a slide projector, on the QX-10 screen.

VALDRAW is a computer-assisted-design (CAD) package that can be used on any QX-10 computer. Although it is much more responsive when a mouse or graphic tablet is used (these generally plug into the serial port on back of the QX-10), Valdraw can be driven from the keyboard with the cursor control keys as well. This program offers a sophisticated set of drawing tools, including circles, arcs, lines, french curves, rectangles, zoom, block copy, and block insert. Valdraw includes automatic scaling and dimensioning. (The scaled distance between two points on a drawing is computed and displayed inside standard dimension lines and arrows.) Three dimensional projections and processing is not included with the initial release.

Libraries of shapes are being developed. These presently include architectural symbols (furniture, household appliances, doorways, and the like) as well as electrical, electronic and mechanical engineering symbols. Users can, of course, design their own libraries of often used shapes whenever desired.

Images produced by Valdraw can be plotted on Comrex and Epson plotters, printed graphically on Epson printers, converted for use with the rest of the VALDOCS system, or "painted" with Valpaint.

VALPAINT was first shown at the National Computer Conference in Las Vegas this year. Valpaint provides a complete "artist's toolkit" for drawing images on the QX-10 screen. Both color and monochrome (green and black) QX-10 systems can run Valpaint.

Like Valdraw, it can be used with cursor controls, but for anything practical, a good mouse is a must. (The Rising Star people have been using the PC Mouse from Mouse Systems Inc.)

Valpaint provides all the usual painting tools, including adjustable brush sizes and shapes, spray paint, area pattern fill, erasable borders and area copy.

Additionally, it offers a "recorder" which records the things you have done. These are duplicated when played back to another area of the painting.

Another impressive feature is image zoom. The image on the screen can be magnified up to 16 times. At this scale, individual pixels, by now about a half an inch square, can be colored to achieve dramatic and precise shading. Images produced by Valpaint can be printed on Epson printers, including the new JX-80 color printer.

CARDFILES is a miniature data-base management system. You can define the number of entries, names of fields, and so forth, and construct a catalog of cards with with any information you care to enter on them. It is very easy and convenient to use. A full-sized data-base manager will be available later as VALDOCS version 2.0 develops.

LABELS is a mailing-label manager allowing labels (or other information that can be formated on a line-to-line basis) to be entered, edited, and printed with VALDOCS. The intended application for this program is to manage and print mailing labels, but it can easily be put to other uses.

OTHER SOFTWARE PRODUCTS

Rising Star Industries offers a number of software packages for the QX-10 and VALDOCS. The TPM-II (and soon TPM-III) operating system is available with a disk containing a number of very useful utilities included with the "TPM User's Guide". The price of the TPM-II User's Guide is $21.

The Programmer's Guide to VALDOCS gives programming techniques to take full advantage of the video drivers, indexer, windowing, and other features and services offered to systems programmers by the VALDOCS operating environment. ($18)

RSIBASIC is one of the few Basic interpreters for 8-bit microcomputers offering over 83K of memory. This Basic provides over 180 statements and commands, and offers high resolution graphics, eight Turtle-graphics commands, 16 character fonts, full color capability, chaining, sequential and random access files, and more. The manual is over 390 pages long. ($99)

VALDOCS COMMENTARY

The success of the QX-10 is partially the result of VALDOCS version 1 achieving the goal of being usable by anyone. VALDOCS can almost be run on intuition alone. This is because all programs are driven by menus carefully worded to make sense to ordinary people (civilians, if you will), not just members of the computer priesthood. Exceptional care and a lot of experimentation has resulted in menu statements that mean the same to everyone, regardless of technical background.

Menu driven operating environments alone do not make integrated software, but the trend, startiingd first with the $20,000 Xerox Star computer, indicates how software will be patterned in the forseeable future.

One of the most obvious differences amoung the "integrated" software systems is how various menu items are selected and text is "pointed to." Apple's Lisa and MacIntosh use a mouse; Hewlett-Packard has you point a finger to the text on the screen. VALDOCS provides a formal editing cluster on the keyboard. Except for the actual pointing mechanism involved, all three approaches accomplish the same thing.

After a particular keyboard and system is learned you will eventually become very frustrated every time you have to take your hand off the keyboard during text entry to move a mouse around or put another fingerprint on your screen. It doesn't take a person very long to learn how to use a menu-driven system and to become a relatively fast typist; dragging a mouse around on your cluttered desk, or raising your forearm to eye level is not going to increase throughput for very long. I think the VALDOCS-HASCI keyboard approach is the correct one for text entry.

Graphics entry is best entered with a graphics tool. A mouse or graphics tablet are much better choices than cursor keys, but are an extra-cost item.

Of the mice available, the best (and most expensive, unfortunately) are optically-driven. These require a special ruled pad that is sensed by the mouse as it moves. Mechanical mice, such as those used on Apple products, have a ball that rolls on the tabletop. This typically slips, giving poor resolution, especially after it is dirty.

Graphics tablets are especially good for transfering data accurately into a computer system. Unlike mice, which only provide movement information, a graphic tablet gives an actual X-Y position for the stylus. Graphics tablets are a must when drawings have to be accurately copied into your computer.

VALDOCS version 2 software will be released to the public just before the end of the year. Right now it is in the final debugging stages, and very minor revisions are still being made. But VALDOCS 2.0 has been worth the wait. After following its development and the frustrations of all the those working on it at Rising Star, I am no longer a neutral observer. But I think that you will find VALDOCS 2.0 is everything version 1 demonstrated and promsied to be. ●

CATCH A RISING STAR

Editor's Note: This article is adapted from a series of articles that appeared in The Rising Star, *a customer newsletter published by Rising Star Industries. It appears in* Epson World *by permission from Rising Star.*

BY GORDON MUSTAIN

Exploring the question,"What is Rising Star industries?" is a bit of an adventure. Just when you think you've got a handle on it, you look at it from another angle and a whole new perspective appears.

From one viewpoint, it's a small, closely-held corporation founded in January of 1982 in Torrence, CA, by Chris Rutkowski, to design and develop software and hardware for the Epson QX-10 personal computer.

From another, it's a collection of off-beat, future-tech, creative crazies lead by someone self-described as "a little wild and wooly around the edges and not quite civilized," all "riding the curl of Alan Toffer's Third Wave on a silicon surfboard."

From still another viewpoint, it's a model for the new "Information Age" corporation. It's an electronic cottage industry, using the personal computer to do everything from eliminating the aggravation and wasted time of Southern California freeway traffic to allowing staff to live where they wish while tailoring work schedules to individual biological and metabolic clocks.

What's this? A game where everybody wins? Impossible, right? But then, according to Rising Star Industries' company motto, "Only the Impossible is Worth Doing." Therein, as someone once said, lies a tale.

EARTH'S KEY TECHNOLOGIES

To reach an understanding of this organization, it's necessary to know a bit about RSI's founder, Chris Rutkowski. The two most important things to know about him are:

1) He firmly believes with Buckminster Fuller that "the only thing required to be brillantly negative is a mouth;" and

2) It *really* is possible to make the world a better, more comfortable place to live.

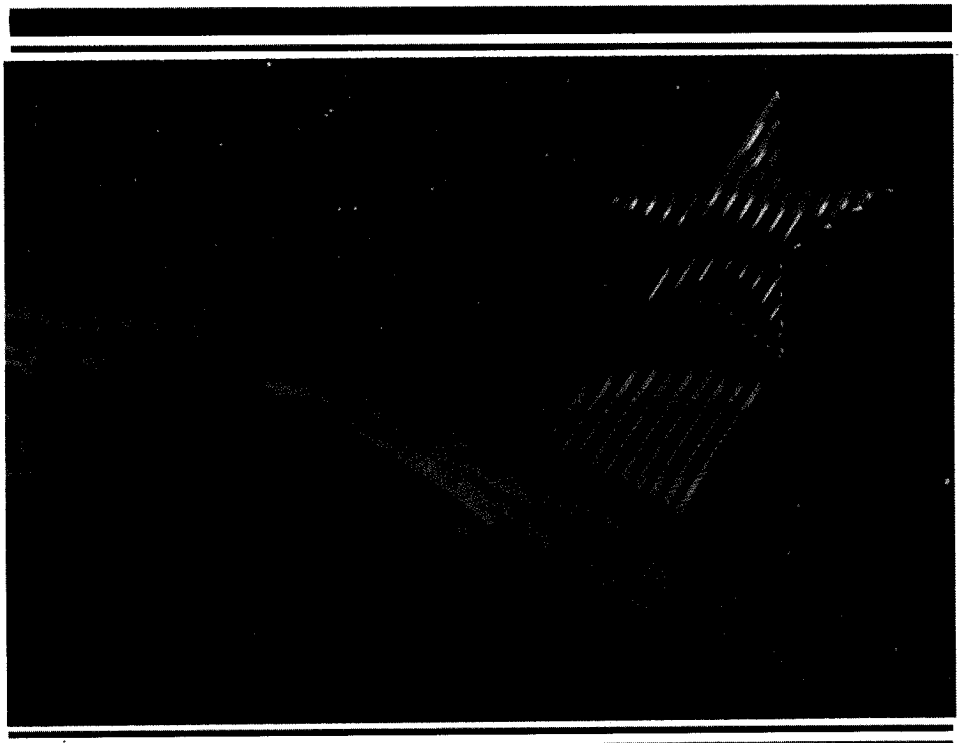
As he puts it,"I have this silly concept that I can change the world . . . Since I was a kid, I've had this feeling: 'If we don't like the world the way it is, why don't we just change it?'

". . . Relatively speaking, the problem we are facing is a fairly simple one. There are a number of key technologies missing on this planet, technologies that mankind really needs in order to hit [its] stride. I've isolated what those technologies are through the study and development of a subject I call *Architectural Stabilization*, which involves an entire theory of systems evolution.

"That theory not only isolates the needed technologies which we don't currently have, but helps to put them within reach.

"Don't get me wrong, I'm not talking about Utopia. Every attempt to create Utopia has failed. I just want to make the world a little safer than it is today, just make it a place where Man is able to create and where his primary reward and goal schemes are based on creation rather than destruction."

TECHNICAL DESIGN LABS



So what does all this have to do with developing software for the Epson QX-10? Quite a bit, actually. It goes back to some fundamental observations Chris made and to some understandings he reached, during the first years of his involvement with microcomputers.

To set the stage, the microcomputer industry actually began in January 1975, when the Altair computer was introduced to the "home-hacker" market. Chris had just returned from an extended stay in Europe and was, in his words, "looking for the next technology to get involved in, the next major technical product which would have a positive effect on society." Thus, when he ran into an old friend who introduced him to the embryonic technology of the microcomputer, he was ready.

By mid-1975 Chris was studying micros from a marketing standpoint and in terms of Architectural Stabilization. Since Architectural Stabilization involves the study and prediction of the evolutionary stages something goes through before it's accepted and used on a mass scale, he was already thinking about the stages ahead for the personal computer.

In January 1976, he joined forces with Roger Amidon (currently the head of the systems group for RSI), and Carl Galletti (former owner of Computer Design Labs). They formed a company called Technical Design Labs.

In August that year, at the first computer trade show ever — the Atlantic City Computer Festival — they started selling their first product: the ZPU, the first Z80-based product for personal computers to hit the market. The idea had been Carl's, Roger had done the design, and Chris arranged the financing, set up the introduction at the show, and designed and wrote the manuals and ads. In the next 24 months, they sold 7000 boards.

During the two years of its existence, Technical Design Labs came out with a number of "firsts:" first Basic, first macro assembler, first editor, and first text processor to do word processing. In two years they grossed over $3 million in sales.

INTEGRATED DREAM

Even in those early days, however, Chris was thinking of the personal computer as a tool of immense cultural and social value. He found once past the apparent complexities, computers were actually quite simple.

"The problem," in his words, "was to strip away those complexities so that Mr. Average wouldn't have to fight with them."

In 1977 he put those ideas down on paper for the first time, doing the basic design work on a product line for TDL consisting of a desktop microcomputer, a keyboard, two disk drives, a CRT, and an integrated software package which would handle the needs of the average person. Beginning to sound familiar?

Keep in mind that in those days there was nothing like it on the market.

By 1978 they had a working prototype, a name (The General), a workable retail price ($4000), 60-plus dealers signed up, and $35 million in orders. What they didn't have and couldn't get was the venture capital to start production. The General never went to market.

As Chris puts it, "I saw, as early as '76, that mass production capabilities were going to be the key to the success of the personal computer. It's the only way to get it out inexpensively and in volume.

"Unfortunately, in '78 there was no widely recognized market yet. Apple was just starting to grow with a major infusion of venture capital, but there was not much of it around at that point.

ALWAYS ON LEADING EDGE

"It's just one of those things. It seems like I've always been on the leading edge of things. My ideas today are not better than they were then.

"But today I've got seven years of experience and a couple of failures under my belt. And with Epson, I've got the backup I've never had.

"It's a perfect combination: the Japanese mass-production capabilities (probably the best available anywhere on earth today), and good old Yankee ingenuity.

In mid-1978 TDL was bought by some consultants who tried to arrange financing, but failed.

In May 1979, broke and deeply in debt from TDL bills (he had refused bankruptcy as immoral and eventually repaid all his debts), Chris packed up his family and moved to Monterey, CA, where he went to work for Omnigistics, a direct-mail marketing company in nearby Salinas.

On his own time he continued to work on his theories of system evolution and Architectural Stabilization, and he began to realize they applied not to just technological products like the automobile or computers, but virtually all human systems. Using the theory as a predictive tool, It seems like I've always been on the leading edge of things. My ideas today are not better than they were then. Using the theory as a predictive tool, he began to see which products and techologies were going to have to evolve in order for mankind to achieve anything like a stabilized social system.

HASCI DEVELOPED

One of those products was the personal computer. Pulling out his notes on The General, he began refining them, looking for the ideal configuration of form and function (the architecturally stabilized design) that would allow mass acceptance and utilization of microcomputers.

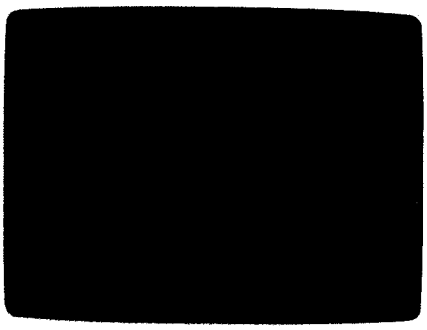
The concept of HASCI (Human Applications Standard Computer Interface) was born. It was still to be a while, however, before the concept would become a reality.

> "I just want to make the world . . . a place where Man is able to create and where . . . schemes are based on creation rather than destruction."

In October 1979, Chris left his marketing post with Omnigistics to dedicate himself to the research of his theories. "We were penniless," he recalls, "and my decision to go it alone provoked considerable hardship on my family. But I believed, as Bucky Fuller had said, that if one were aligned with the force of Universal Evolution, the wealth of the universe would provide one's support."

Not quite a month later, through a friend, Chris met Yashuhiro Tsubota, the president of Epson America. It turned out to be a meeting of considerable significance.

When Chris and Tsubota met, Shinsu Seiki — part of the Seiko group of companies — was already established as



the world's largest manufacturer of precision electronic printers, turning out 70 percent of the world's calculator printers (700,000 to 1 million units per month). The company was then almost exclusively an Original Equipment Manufacturer (OEM), producing the components that other companies turned into consumer products.

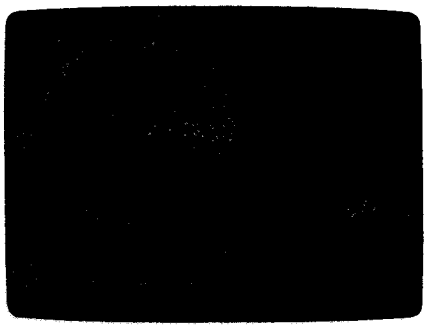
WILD AND WOOLY EDGES

Shinsu Seiki's subsidiary, Epson America, had introduced its first consumer product into America the previous year, the TX-80 dot-matrix printer. They had, however, sold only a few units.

Epson wanted to develop a nationwide dealer network for an advanced version dot-matrix printer (which would eventually become the MX-80), and Tsubota was looking for an innovative American for the job.

According to Rutkowski, "I was a little wild and wooly around the edges, and not quite civilized, and a little bit crazy. When I said 'I'll make you number one,' Mr. Tsubota laughed. But he hired me."

Chris came on board as manager of market research and development.



Twelve months later, he became national sales and marketing manager. In the interim he had been busy.

Epson had the key ingredients for storming the microcomputer market as he had envisioned in 1975. Epson's high engineering standards, virtually unlimited working capital, and mass production capabilities were an unbeatable combination. The task he set for himself was to discover the best way to make use of these resources in order to make the MX-80 the number one selling printer in the United States.

ATTACK ON MARKET PLANNED

He began by conducting a survey of the marketplace. This survey indicated the public's number one concern was reliability, a major asset Epson already had in its quest for dominance.

Epson, as a supplier to manufacturers around the world, had learned to contend with long shipping distances and very high volume production, both requiring exceptionally good quality control. As Chris explains it:

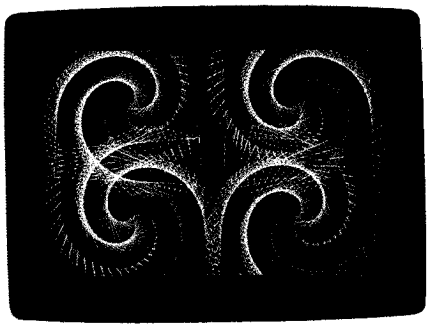
"When you're making a million pieces of anything a month, anything more than a .1 percent failure rate would require enough repair technicians to short circuit both output and income."

Second in importance was print quality. High quality text was attainable in the marketplace, but only with slow and expensive daisywheel printers. Inexpensive dot-matrix printers such as the MX-80 still lacked sufficient quality, even though users surveyed did not insist on the ultimate precision of a Selectric-typeface.

Oddly enough, despite what a lot of people were claiming, print speed was not essential — it wasn't even in the top five on the list of priorities.

CORRESPONDENCE QUALITY

In trying to find a way to meet this demand for print quality, Chris discovered a unique feature of the printer Epson had not capitalized on. Epson's designers had met specifications for double-strike printing (which fills in each letter with extra dots) in order to bold face a word or phrase in a sentence. What had not been seen, however, was using this double-strike mode over an entire page or document provided an enhanced print quality (at a minimum



cost of printing speed) which would more than satisfy most print quality demands. Chris coined the phrase "Correspondence Quality Printing" to describe the feature.

The ideal printer would also have to have graphics capabilities, the third most important feature according to the surveys. Graphics flexibility, including the ability to print a variety of fonts, was what Chris wanted. However, making this happen was not quite as easy as solving the image quality problem. It required new software inside the printer.

Having determined what it would take, Chris contracted with Richard Mossip to produce the new internal software package to multiply the features of the printer. It provided superb graphics and italics, and the result — Graftrax — was added to the MX-80 in mid-1981. The Japanese later expanded the software, now known as Graftrax-Plus.

> "[I]n an ideal product line . . . certain fundamental functions . . . should be consistent throughout. . . . if you put a Rolls Royce and a Subaru side-by-side. . . . [f]unctionally . . . they are identical. What varies between them is price and quality."

Armed with an excellent and exciting product and backed by a company able to produce reliable products in volume, Chris put together an effective sales network. He hired the sales staff and trained them to meet the customers' needs.

TAKING CARE OF BUSINESS

The surveys, however, had pointed to another very interesting fact. Many dealers were dismayed and put off by the lengthy contracts necessary to do business with many printer manufacturers. These contracts often required complex calculations for unit pricing at various purchase quantities and burdened dealers with excessive minimum purchase amounts.

Chris decided the fastest way to capitalize on his superior product would be to make it very easy to do business with Epson. At his suggestion Epson simplified purchasing procedures as well as reducing the dealer agreement to a bare minimum of legal language.

This still wasn't enough, however. The dealers had to learn about the new program and be convinced to sign on. To accomplish this, Chris conceived an advertising and direct mail campaign, writing most of the ad copy during the first year of production. His "Business Simplified" brochure, part of the introductory dealership campaign, won the 1980 Western States Advertising Association Award.

The combination of his marketing campaign and well-trained staff produced remarkable results. The MX-80 printer was formally introduced September 1, 1980. By the end of November, less than 90 days after its introduction and before the printer had really even begun to attract notice, Chris's crew had signed up Epson's 1000th dealer. The sales boom was starting.

CUSTOMER SUPPORT

But this was only the beginning. It has always been a belief of Chris that what happens after the customer carries the product out of the store is as much a part of marketing as the advertising attracting the customer.

Earlier, pursuing his belief the user should get a useful tool that was easy to learn, Chris had hired David Lien to write the owner's manual for the MX-80. Lien had written the TRS-80 manual, one of the first computer manuals a lay person could actually use. Lien's manual was a radical and welcome departure from the usual technical jargon and complex schematics characterizing most printer owner's manuals.

Chris also made certain there was an after-sales service function set up and operating to support the product. Word of mouth advertising quickly became an important force working in Epson's favor.

Having combined the product attributes of low cost, high quality print, and reliability, with an innovative and hard-hitting marketing campaign, Chris watched the Epson MX-80 quickly become the dominant dot-matrix printer in America.

LEADERS CAUGHT NAPPING

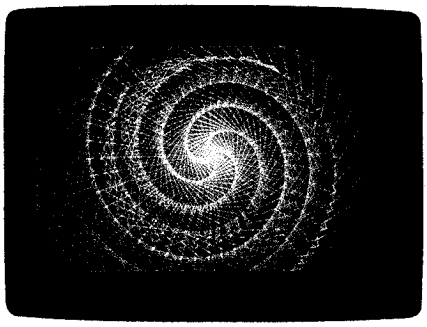
When it was first introduced, in September of 1980, Centronics was the industry giant with a 50 percent market share, followed by Integral Data Systems, Texas Instruments, and Anadex. The swift development of Epson's dealer network and the "blitzkrieg" marketing program caught the leaders sleeping.

At the time Chris kept cabling Japan, saying "Make more printers! Make more printers!" By April of 1981, Epson was selling tens of thousands of printers a month, limited only by production schedules.

By the end of 1981, Epson was widely acknowledged as the industry leader. Chris had made Epson Number One, and Tsubota was still laughing, but not for the original reason.

"We were successful," Chris says, "because we combined good old fashioned Yankee ingenuity with the best engineering and manufacturing on earth. Bringing those two things together made an unbeatable combination.

"I believe this about the world, as well



— taking Japanese and American concepts and combining them will probably make a much stronger society than anything we have today."

By mid-1981, riding the crest of their success with the MX-80, Epson management made a decision; they would enter the microcomputer marketplace. When they told Chris and asked him what he thought their products should be like, it was Chris's turn to smile. He'd been ready for that question since mid-1975.

CHRIS'S WISH COMES TRUE

"Not now."

That's how Tsubota responded throughout 1980 and early 1981 whenever Chris brought up the idea of Epson building a microcomputer for the American market.

As Chris tells it, "It was always the same response. Never,'no' — just 'not now.' So I never gave up. I kept asking."

> "I came up with this concept to form a sort of artists' stable in which some of the brightest, craziest, most creative minds we could come up with could be brought together to work on . . . VALDOCS."

Then, in the spring of 1981, Epson-Japan management made a decision. Due, in large part, to the success of the Epson MX-80 printer in the United States, Epson America was no longer going to be an OEM company. It was now a consumer products company.

"I remember the day the message arrived," Chris says. "Basically they were asking, 'What kind of consumer products do you want to sell? If we can build them, we will.' When Tsubota told us about it, I figured it was time to get busy."

Much of the preliminary design work on what he wanted in a microcomputer was already done, but Chris knew that would not be enough. He began work on a report that included, in addition to those designs, product illustrations, a complete accounting of marketing considerations, and the design philosophy for the product line. When it was finished, the report was 150 pages long.

With Tsubota's approval, the report was translated into Japanese and submitted to Epson Japan for consideration.

ROLLS VS SUBARU

In June of 1981, Nakamura of Japan and Tsubota asked Chris to go to a group of Japanese engineers and managers. He didn't require a lot of persuading. He and Steve Semos, who is still with Epson America's Marketing department, made the trip.

"What I tried to stress in the presentation," Chris recalls, "is that in an ideal product line, what should vary from product to product are price and quality. There are certain fundamental functions, however, which should be consistent throughout.

"It's like, if you put a Rolls Royce and a Subaru side-by-side, it's easy to see that they both have four wheels, and steering wheels, and windows that go up and down. They both carry people and can be used to get people from point A to point B. Functionally, which is to say architecturally, they are identical. What varies between them is price and quality."

From the beginning Chris was going after an architecturally stable design for the microcomputer.

"When we got back from Japan," Chris says, "I knew two things. One,

we were going to get a computer to sell. And two, we — in America — were going to have to develop the software for it. It was while wrestling with the problem of how to get that software done that I hit on the idea which eventually became Rising Star Industries.

ENLISTING THE CRAZIES

"I'd been around the industry since '75 and I knew all these really bright, crazy people — people like Richard Mossip, who had done the original Graftrax software for the MX-80, and like Roger Amidon, who I had worked with on The General back in my Technical Design Lab days. But they were not people you could make into 'employees.' If you put them in a suit and made them punch a time clock every day, you would lose that creative sparkle, that freewheeling genuis which made them the people who create breakthroughs in the industry.

"Traditionally, these are the kind of people who form the backbone of American entrepreneurship. They come up with an incredibly valuable product and then a cadre of businessmen form around them to manufacture and market that product, and they get a piece of the action and the freedom to go on working on new problems and products.

"So I came up with this concept to form a sort of artists' stable in which some of the brightest, craziest, most creative minds we could come up with could be brought together to work on this goal I had laid out, this integrated software system called VALDOCS. It could be set up so they could work their own hours, in their own homes, on the parts of the project which most interested them, and they could share financially in the product.

"The idea was to form an amplifier circuit — a knowledge amplifier. We would develop the best, most creative software possible and sell it to Epson, who would in turn sell it to the public, feeding royalties back to us to finance more research and development. It was a feedback circuit, combining the best creative talent in America with the best of Japanese manufacturing and marketing."

A HOTEL ROOM IN PRINCETON

In September of 1981, Chris presented a written proposal for the establishment of Rising Star to Tsubota. It was approved, and Chris began work on the details.

Meanwhile, development work was continuing on the QX-10. Chris contacted Roger Amidon and Richard Mossip and laid out the situation. They agreed to work with him on the development of the software.

In early November, in a hotel room in Princeton, NJ, Chris, Roger, Richard, and Steve Semos met with three Japanese engineers to talk about the QX-10.

"Roger had come to work for Epson," Chris explains, "so he could work full time on the project, with the full knowledge and agreement that when Rising Star was set up and functional, he would leave Epson and become a part of Rising Star. So he, I, and Steve were there as Epson America employees, and Richard Mossip was there as a consultant to Epson.

"The Japanese brought their hardware design drawings and circuit board specifications and we brought the preliminary design for the HASCI keyboard and some preliminary concepts for the VALDOCS software which had, of course, evolved out of the HASCI design. It was an incredibly productive meeting.

"The hardware specs were fine-tuned to the requirements of the software, the HASCI design was finalized, and we came away knowing what the QX-10 was going to be. It was and is a truly outstanding design. I can honestly say, I know of no better hardware on the market. We knew then that it would take years to develop software to fully take advantage of all the design features."

> "I knew all these really bright, crazy people. . . . But they were not people you could make into 'employees.' If you . . . made them punch a time clock every day, you would lose . . . that freewheeling genuis which made them the people who create breakthroughs in the industry."

BIRTH OF A NAME

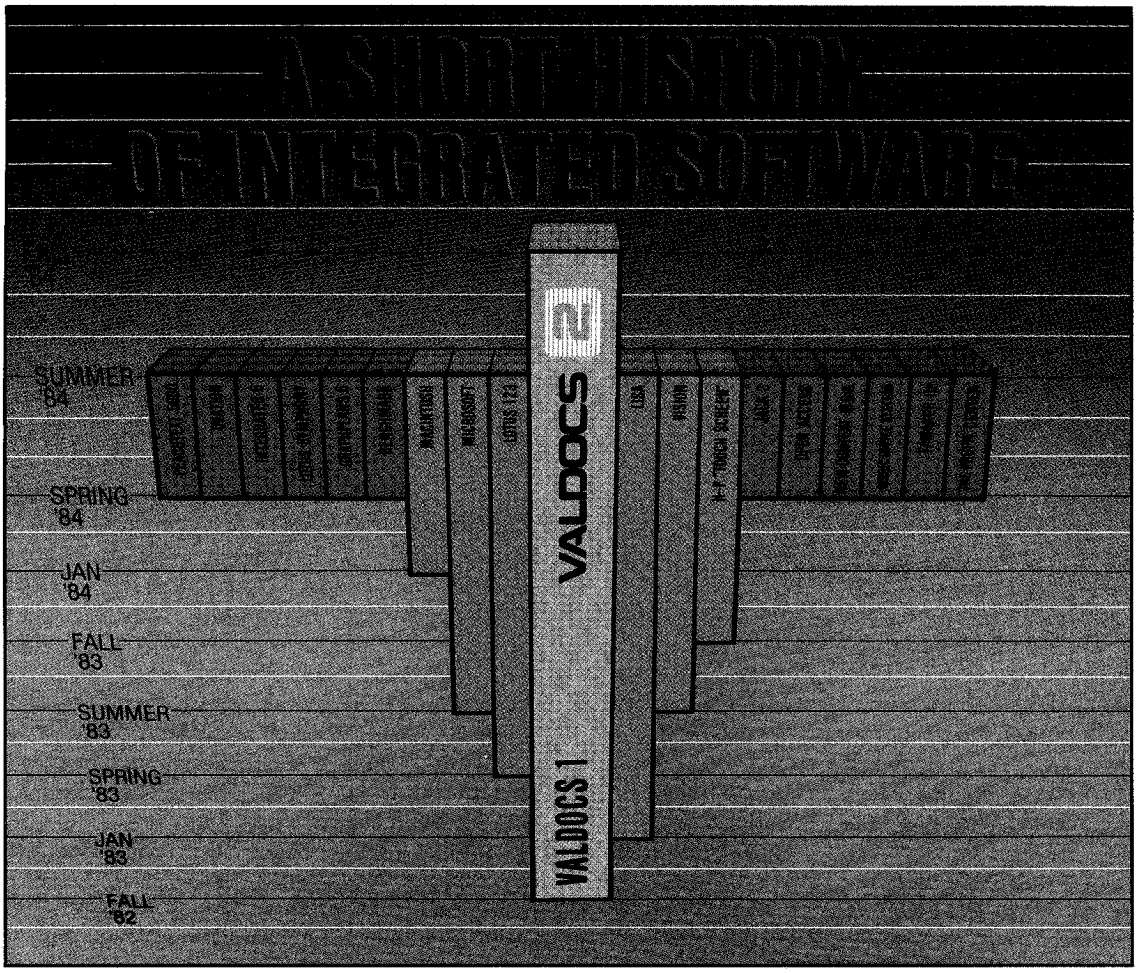
Chris had known the hardware and the software would have to be developed simultaneously, and he left the meeting assured it could be done. Roger, with nothing more than the hardware specs and drawings, began writing the needed system level support code, and Richard Mossip, in his continuing role as a consultant, started developing the first pieces of VALDOCS, utilizing Chris' design concepts.

Development work continued through December, and in the meantime Chris hired Gale Carr, a woman whose work he had known for many years. He knew she was the kind of totally competent and trustworthy person he would need to handle the administrative side of the company while he handled the technical side.

It was near Thanksgiving of 1981, while Chris was working on the legal structure necessary to set up his company, that he hit upon the name. He had come up with and discarded several possibilities because they were too far removed from what he was trying to accomplish with the company. As is his habit when a problem won't resolve, he went back to the fundamentals.

"I asked myself, 'What is it that I'm trying to do?', and I found myself thinking again about the knowledge amplifier concept, the combination of the best American ingenuity with the best manufacturing and marketing on earth. America and Japan. The Rising Sun and The Stars and Stripes. And bang, there it was. Just that simple. Rising Star."

On the 15th of January 1982 the corporation was officially formed. That day



Chris resigned his post at Epson and became president of this newly formed company which consisted of himself, Roger Amidon, and Gale Carr.

TACKLING THE IMPOSSIBLE

"We knew we had a big job ahead," Chris remembers. "After everything was signed, we just sat there for a moment, the three of us, looking at the future. Then we shook hands and said: 'It's up to us to do it.' "

Now, Chris was faced with the task of translating his concepts for VALDOCS into reality. He knew the task would not be easy. Conventional wisdom at the time held that easy-to-use, truly integrated software was an impossibility on any microcomputer, and especially so on a Z80-based machine.

"Of course there was absolutely no empirical evidence to support this contention," Chris recalls, "because at the time nobody had ever attempted to write truly easy-to-use integrated software. Nonetheless, that was the prevailing view at the time. The Rising Star motto, 'only the impossible is worth doing,' came into existence very early on."

One of the key concepts in the early development of HASCIVALDOCS was the choice of processors didn't really matter. The Z80 was chosen primarily because none of the other processors available had the stable, mature tools necessary for development work.

"Comparing the relative merits of various processor chips is like comparing the merits of four, six, and eight cylinder engines," Chris contends. "There are four cylinder engines which are refined to the point of being faster and more powerful than eight cylinder engines. We felt that no one had ever really exploited the full potentials in the Z80. In fact, VALDOCS 2 will be the first software to ever come close."

SIMPLIFY AND AMPLIFY

With Roger busy developing the basics of the operating system code (working off nothing more than spec sheets and design drawings from Japan), and with Gale busy setting up the administrative side of the company, Chris retired to a cabin in the woods near Carmel, CA, and spent a month with Richard Mossip hacking out a first level of the VALDOCS software design.

"Right from the beginning," Chris says, "the guiding design principles were to *simplify* and *amplify*. I had had a chance to study the principles using the Xerox Star, the precursor of Apple's Lisa, and I found the concepts interesting but still far too complex.

"The desktop metaphor of multiple documents on the screen at the same time, while it might have a place in VALDOCS' future, was far too complex to be a fundamental requirement.

"And the use of icons, if carried to its logical conclusion, ends up at the 16,000 character kanji set which is the written Japanese language. Even Apple only uses icons on the first level of choices. Beyond that, the complexity introduced by the ambiguity inherent in icons, forces them to use word labels."

THE PROTOTYPE ARRIVES

Early in that month at the cabin, Chris arrived at what he felt was the central, key concept of the HASCI interface: *The end user should be able to point to the function he or she wants the computer to perform, push a button, and have the computer perform that function.*

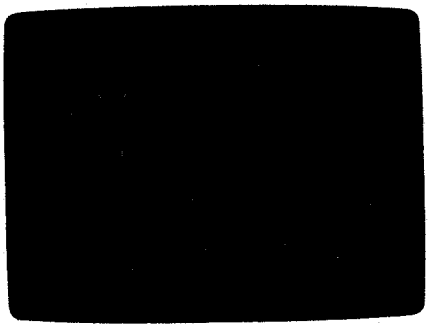
"I emerged from that month with reams of notes, and sketches of interface designs which turned out to be pretty close to the final design," Chris remembers. "Now those notes had to be fleshed out."

He spent March and April on two tasks: looking for the special people he knew he would need to get the software done, and fleshing out the notes for VALDOCS.

Out of this work, Chris distilled two articles on the HASCIVALDOCS concepts later published in the October and November issues of *Byte* magazine.

Roger, meanwhile, had been making considerable progress on the systems level software, still without having seen any actual hardware. In early May the first hardware "prototype" arrived, a wire wrapped board in a metal box, and Roger could finally start testing his code.

"The first actual QX-10 didn't arrive in this country until June, four days before the National Computer Conference," Chris remembers. "Our development efforts had been so tight with the Japanese, that in four days Roger was able to get the operating system up and running, and Richard Mossip had the first cut at the interface working with a little editor and a couple of other things in it.



"We had a private showing for the editors of major computer press magazines during the show, and that's where the press reports started."

HARSHEST CRITICS SILENCED

By fall of 1982, Rising Star Industries had grown to 15 employees. Fall Comdex that year marked the first public showing of VALDOCS software.

"We had managed to get an early version together for the show which sort of worked," Chris recalls. "There was a scheduler, and indexer, a crude editor, and rudimentary mail program. But it was enough. After the show we got the go ahead from Mr. Tsubota and Epson to start development on Version 2."

Even before VALDOCS Version 1 had been finished and introduced into the marketplace, Chris began design work on VALDOCS 2.

He notes, "The point of Version 1 of VALDOCS was to prove it could be done; to prove that, in spite of conventional wisdom to the contrary, it was possible to write integrated and easy to use software."

That proof came rapidly after the introduction of the QX-10 and VALDOCS into the marketplace in March of 1983.

> "It seems like I've always been on the leading edge of things. My ideas today are not better than they were then."

"Even our harshest critics — and there were a few things about 1.14 which merited criticism — but even our harshest critics admitted that VALDOCS was incredibly easy to use, and that it was truly integrated software," Chis says.

Further proof appeared over the next months as integrated software became a buzz word in the marketplace with more and more products showing up with some degree of integration between modules.

THE BEST YET TO COME

"In a little over 14 months," Chris says, "we had accomplished the impossible. That there were bugs in the first release was not only not surprising, but to anyone familiar with software development, it was inevitable.

"Within three months, by June, we had released VALDOCS Version 1.16, which handled many of those bugs. And by September we had released 1.18 which not only handled most of the remaining bugs but enhanced the overall program with the addition of numerous new features.

"I am very, very proud of the development work done by, and the accomplishments of, the Rising Star team. I honestly know of no other group anywhere who could have pulled it off.

"Now we have VALDOCS 2. . . . What VALDOCS 2 actually does is establish the minimum acceptability level for personal computer software at any price. . . . VALDOCS Version 2 will become the minimum standard which people will demand and expect in the computer as mind amplifier. . . ."

"Meanwhile, we will continue to refine and add features to VALDOCS, and to work on Version 3. Version 3 will incorporate some of the theory of HASCI which has never been published. It dates back to a formal document I wrote in 1980 defining a particular capability which will be necessary for the personal computer to attain anything close to its full potential, a capability which does not exist today on any system.

"When Version 3 is done, my original design goal for VALDOCS will have been achieved: VALDOCS will be the only software 90 percent of personal computer users will ever need." ●