

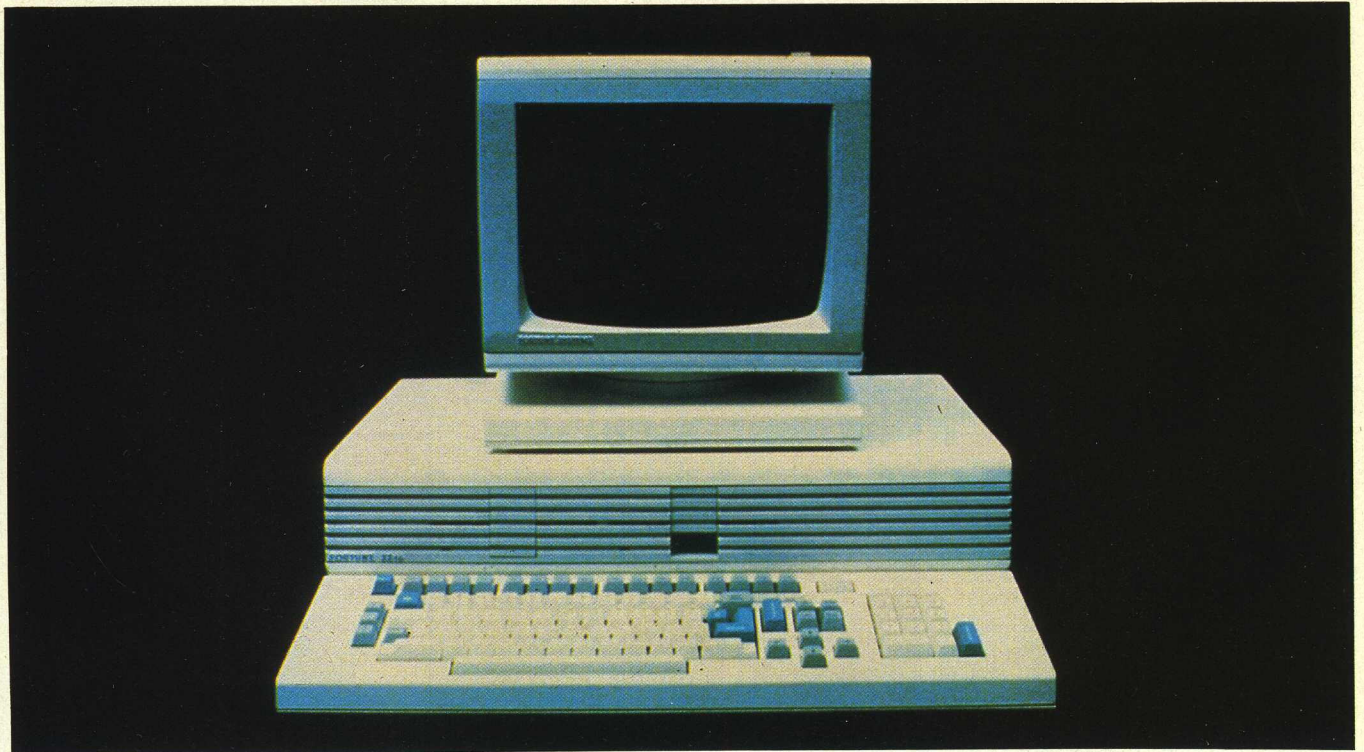
## Fortune 32:16

by Tom Fox

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Nothing at Fortune Systems Corporation (San Carlos, CA) happens by chance. Computer designs don't just spring up voluntarily—they are planned as carefully as the blood line of a champion race horse.

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*Deliberate* is the watchword: not a single feature finds its way into the new Fortune 32:16 computer without being carefully researched and justified by the long-range marketing planners. The company is not yet large—but the most revered position on the corporate staff is filled by an astute individual with the title of Vice President, Planning. In the fledgling microcomputer industry—born in garages and propelled by young engineers whose technical cleverness often outstripped their business acumen—this kind of an attitude is new, almost alien.

If Fortune's approach to microcomputers is fresh, it is firmly founded in principles that have spelled success for the more traditional computer companies during the past 30 years. The time-tested formula: find out what the customers need (or *will* need over the next few years), recruit the best available talent to execute the design, and take the product to market in a manner that leaves no areas uncovered.

This approach is rare, largely because it takes a lot of money to bring it to fruition. In Fortune's case, the company's unique attitude was able to attract

\$40 million in venture capital before the first computer made a memory fetch. This money has been used to build a company and a marketing organization, and to develop the first product: the Fortune 32:16.

This three-piece desktop micro is attractively surrounded by a metal and plastic enclosure taking just a little more table space than an ordinary display terminal. A 6-in. tall rectangular box, 22-½-in. wide by 14-in. deep, contains the bulk of this system's electronic and mechanical components. A compact display screen usually perches on top of the main box, with a generously-proportioned detachable keyboard placed in front.

The system's styling follows a crisp, deliberately futuristic scheme, which, to our eyes, suggests European origins. The simple bold horizontal grooves deeply etched into the front panel set this product apart from any other machine. Colors are off-white and a pastel grey-blue. The design is distinctive, yet intended to fit into a variety of office environments without calling attention to itself.

The display screen is contained within a tightly-wrapped plastic skin, and fits into a giant ball socket in a slim flat base. Aiming the screen to ward off ambient light reflections needs but the pressure of a fingertip. The screen itself displays 25 lines of 80 characters each in a green glow. Perhaps it's the type font selected, but we found the character definition to be just average, somewhat inferior to the best the competition has to offer.

A generous allocation of 256 separate characters is available on the display screen. This takes care of the needs of several foreign languages (including a little Greek), as well as special characters such as horizontal and vertical lines. The latter can be utilized to draw simple forms and present limited graphics pictures, such as bar charts. Thirteen special characters are reserved for the exclusive use of For:Word, this machine's word processing program. Each character position can be enhanced via the following attributes: reverse video, blinking, overstrike, highlight and underline, both single and double.

To a user, the keyboard soon becomes the most important part of a computer. This is the area where a well-done design can endear a system to the operator. It is also the component that, if poorly executed, can sentence the purchaser to years of frustration and under-the-breath mutterings. The Fortune makers supply one that combines the best of the currently available ideas on the subject.

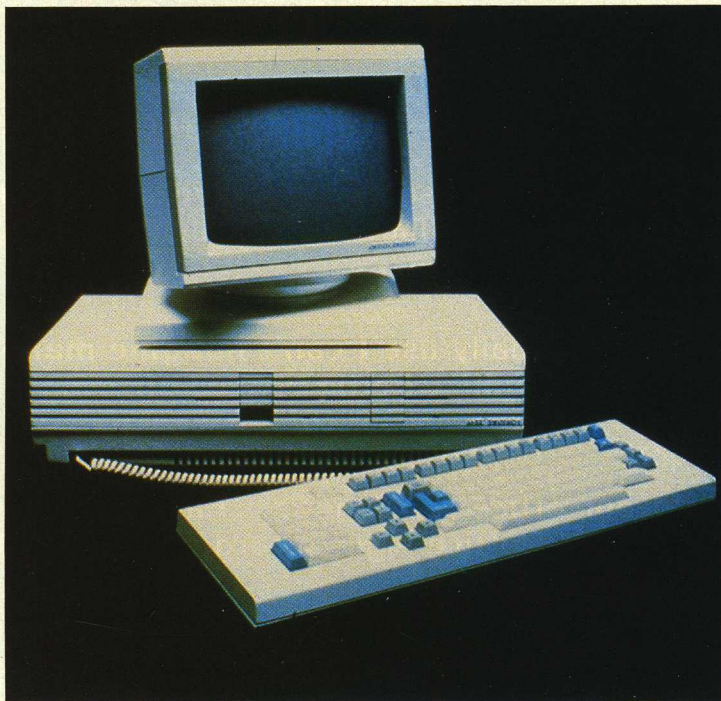
It's an ample keyboard, just as wide as the computer itself and 6-½-in. from front to back. This area is almost completely filled with keys—99 in all. The ones fingered most often are arrayed in the nearly standard dished pattern to minimize finger travel. The numeric keypad contains keys placed exactly as they are on most desktop calculators—a detail missed by some other terminal makers. Color coding is used to good effect. Most keys are white; special ones a light grey; "action" keys a contrasting blue.

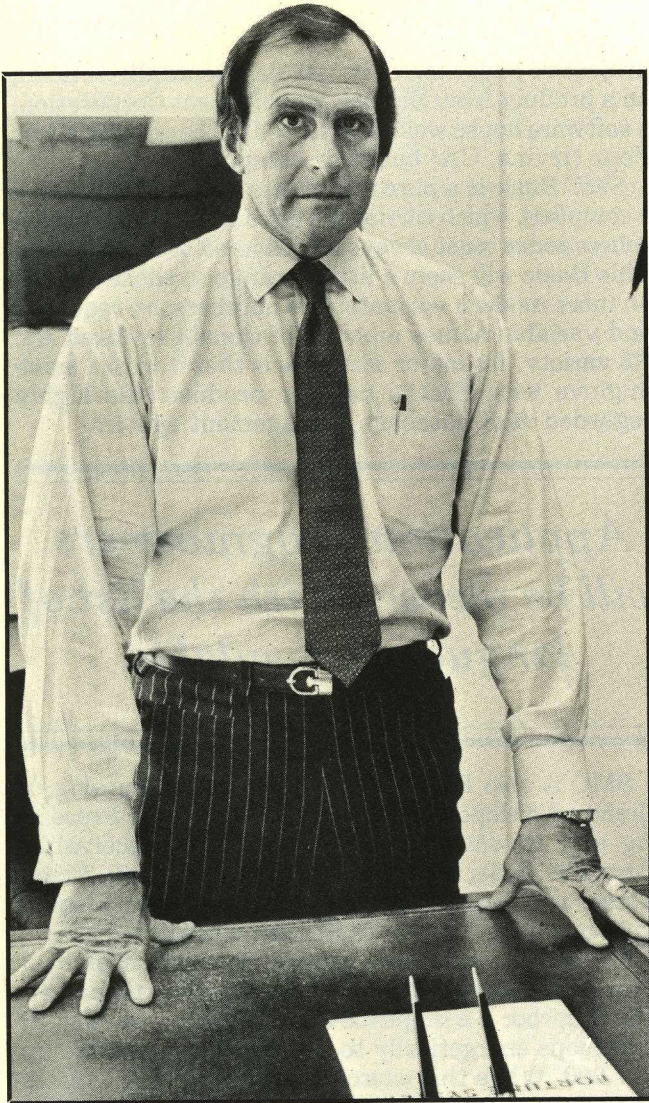
Several of the special keys have to do with the For:Word word processing program. They are functionally equivalent to similar keys on Wang word processors, and even positioned similarly in relation to neighboring keys. A row of 16 are assignable to special functions by a programmer.

A slim plastic strip can be fastened just in front of them to provide a customized legend for each program. It's the first modern keyboard we've seen that omits a HOME key.

Two of the largest keys—EXECUTE and CANCEL—have special meanings in several of the Fortune-provided programs. Pressing EXECUTE moves the user forward through a program (e.g. to the text logical menu). Depressing CANCEL does just the opposite: it sounds a retreat through the path of previously-entered EXECUTEs. It's a logical and easily-learned means of moving around within and between applications programs.

The 32:16's processor is contained within a 30-pound box that also harbors the system's disk storage. Both floppy and hard disks are available; all fit the standardized 5-¼-in. package. There is room for two disk drives, and the mix is usually one of each: a Winchester hard disk for the main working storage





*Gary Friedman, President and Chief Executive Officer of Fortune Systems Corporation*

and a single minifloppy to back up the data from the Winchester. One of the most commendable of Fortune's design decisions allows a purchaser to expand even the tiniest of 32:16 configurations into the largest possible computer system by simply adding parts. This upward compatibility works just as well in the software area as it does for hardware components.

The floppy diskette is double-sided and double-density. It can hold up to 800K bytes (0.8M bytes) of data. The much-advertised "under \$5,000" basic computer includes only one of these drives as its sole mass storage device. Such a system would be limited by the capabilities of its disk drive. The power of its processor and sophistication of its software would be severely hobbled.

Hard disks are available in three sizes: five, 10 and 20M bytes. Figuring 2,000 bytes (characters) per average double-spaced typewritten page, the largest disk would have enough room for ten thousand pages

of text. Desktop computers have indeed come a long way in recent times.

However, the sword cuts two ways. A disk full of data must be backed up by the user, lest an equipment problem or human error cause its inadvertent erasure. Such disasters are rare, but most computer data is just too valuable to take even a small chance with its survival. Given the 32:16's design, the user is faced with the task of creating up to 25 floppy diskettes to protect all the data on the largest available disk drive. This is a lengthy, tedious chore too easily put off. There is talk of introducing a streamer magnetic tape cartridge to provide a handier means of data backup, but we haven't seen Fortune's release of this product as yet.

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The engine in the 32:16 is Motorola's MC68000 microprocessor. A giant chip physically, the 68000 actually contains two internal processors: one to execute instructions, the other to pre-fetch subsequent instructions in the program stream. This is called "pipelining," a form of parallel processing much utilized in the largest of supercomputers. To the devices connected to it (such as system memory), the 68000 appears to be a full 16-bit computer. Internally, however, this device does much of its work in 32-bit "longwords." The "32:16" designation on the computer's nameplate comes from this unique capability.

The basic cycle time for the microprocessor is 5.5 MHz—5-½ million cycles per second. This is faster than the 4.0 MHz seen in most of today's 8-bit microcomputers, but slower than the 8.0 MHz native capability of the 68000 itself.

When they sat down to design the 32:16, the engineers had the distinct advantage of beginning with a clean sheet of paper. They crafted a new, proprietary dual bus design clearly planned for future expansion. Memory management in this machine is unique and extensive. All data transfers to main system memory and the Winchester disk can be subjected to dynamic error detection and correction algorithm, taking this worry out of the minds of the computer user.

Most of the system's electronic components are contained on a single large circuit board. Memory boards, as well as disk controllers and input/output (I/O) cards plug into an array of sockets on this main board, much as they are in an Apple or IBM Personal Computer. Four slots are available for memory; five

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for the I/O devices. Standard memory size is a generous 256K bytes, with expansion to four times that amount possible.

If CP/M is today's standard microcomputer operating system (and it very nearly is), what will be tomorrow's? Since CP/M was written for 8-bit computers, many think it inappropriate for the next generation of 16-bit machines. When shoptalk drifts to the "best" operating system for computers in the class of the Fortune 32:16, the name Unix is mentioned often. Unix is a complex piece of software originally developed for minicomputer-class processors by the Bell Laboratories arm of AT&T. It is lauded by many as being a powerful, flexible vehicle for developing new software; by others, as being too complicated for day-to-day business computing.

The Fortune programmers recognize the power of Unix, and are uniformly happy with it as their working environment. They particularly like the language called C: it's primitive enough to exercise every part of a processor very efficiently, yet sufficiently high in level so that the code is easily understandable and maintainable. Fortune's Unix includes a thick book of system utilities—over 300 in all. It's a worker's operating system, and working programmers love it.

On the other hand, Fortune's architects recognize that not all of their customers are programmers, so they wrote a "shell" program that presents the typical user with a friendly, mistake-proof facade. When you switch on a 32:16, the screen lights up with a large master menu containing 36 selections, arranged in six logical areas. You can use the four arrow keys to move a highlighted cursor over any of the selections (or simply enter a number) and push the EXECUTE key to invoke that activity.

Menu selections are there for each of the major business applications programs, for the word processor, and for a clutch of utilities and demonstration programs. There's always a way back to the master menu by successive banging on the CANCEL key. Those who want to exit directly to Unix can do so by a simple keystroke sequence.

### Standardized menu is offered

Menus are the same for all 32:16s, no matter what the software configuration. Even if your machine wasn't purchased with a particular program, the master menu invites you to activate it. When you try to do so, the screen politely displays the name and phone number of the nearest Fortune dealer where you can purchase the particular software module. No dummy, this machine!

Applications programmers will be pleased at the list of languages available on the 32:16: Basic, C, Cobol, Fortran and Pascal. As with most other business microcomputers, the heaviest reliance is on Basic. Instead of selecting a familiar variant of Microsoft or CBasic, Fortune characteristically opened a study

project to pick the "best" Basic, eventually settling on a product from Science Management Corporation, a software house well experienced in the popular Basic Four (Irvine, CA) business computer.

SMC Basic is a pure interpreter (as contrasted with a compiler), which carries the advantage that program source codes must always be delivered to the end-user. This Basic will seem a little strange to those trained on more modern variants: line numbers are required, and variable names must be of the abbreviated A\$, B\$ variety. Its major attribute is that it works hand-in-glove with SMC's premier product: the highly regarded Idol database management system.

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SMC is also Fortune's source for a fat catalog of already-developed business programs: Order Processing and Inventory Control, Accounts Receivable, Purchase Orders, Accounts Payable, Payroll, Fixed Assets and General Ledger. These have been adapted to fit into Unix via the master menu described above.

For reasons we cannot explain, the 32:16 stumbled when confronted with our Prime Number Cruncher. The Cruncher is a simplistic Basic program (IA Aug 81) that loops energetically to list all prime numbers up to 1,000. While this exercise tests but a few aspects of a computer's performance, we were surprised that the Fortune's micro was actually slower than an Apple II Plus. At 1010 seconds, the 32:16 is less than 1/8th the speed of the best of the 68000-based computers we have tested.

All current Fortune computers carry the 32:16 designation. The System One version, listing at \$4,995, features 256K bytes of memory, a single 800K-byte floppy disk drive, a 12-in. green display screen and keyboard and a copy of the single-user Unix operating system. A single RS-232C asynchronous serial I/O port is also included. The System Two adds a second floppy drive, and adds \$995 to the price.

The System Five is the smallest hard disk system. It contains a 5M-byte Winchester disk drive, as well as a single floppy drive for backup and program interchange. This costs \$8,990. Hard disk capacities of 10 and 20M bytes are offered in the System Ten and System Twenty. These list for \$9,990 and \$10,990, respectively.

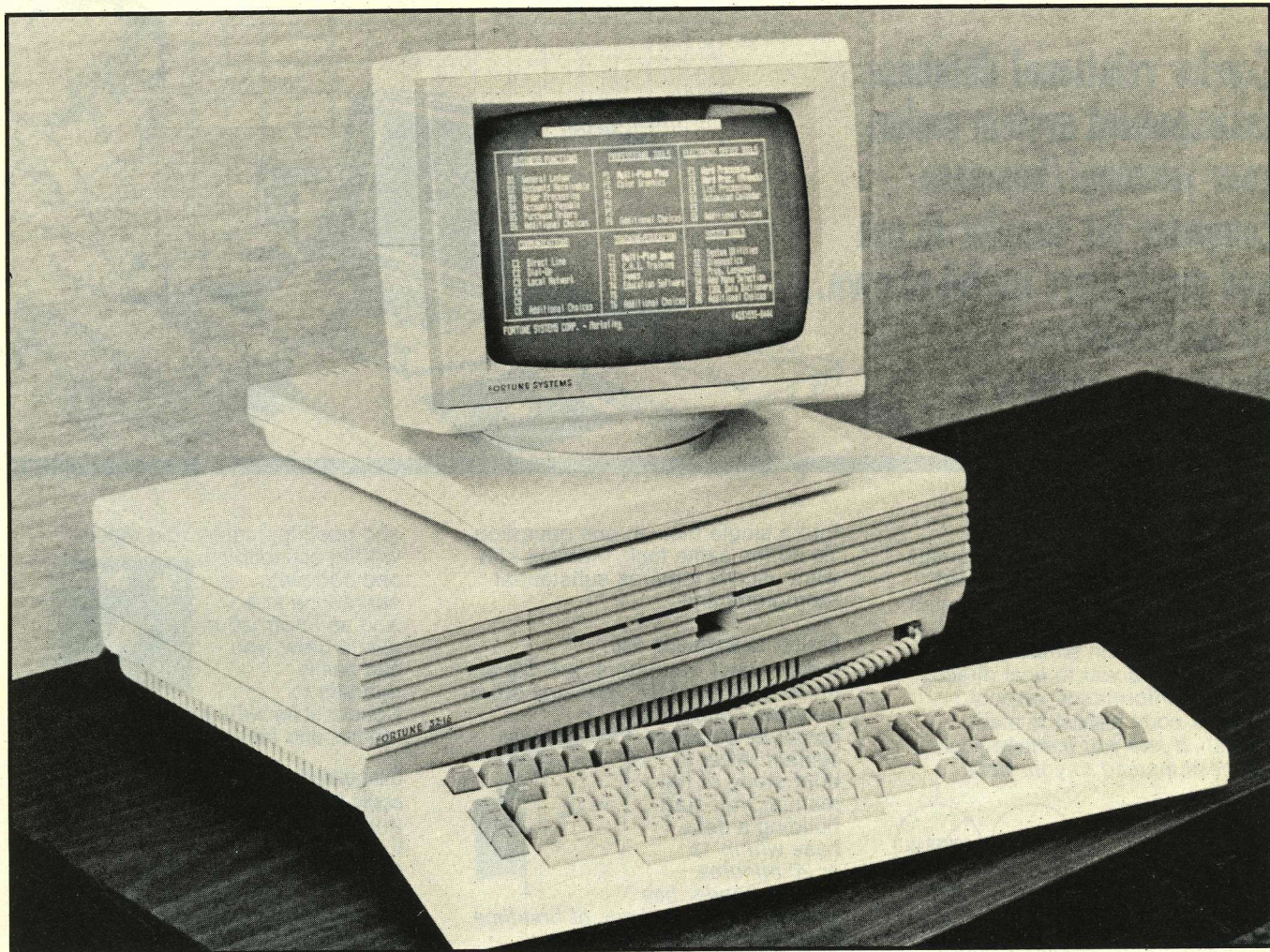
Extra memory costs \$750 for a 128K-byte board; almost double that for a 256K-byte unit. Serial and parallel I/O boards are available to handle from one to four ports per plug-in unit. These range in price

from \$295 to \$495. Intelligent communications controllers for special interfacing needs are available at prices starting at \$795 for a two-port unit.

Even though the internal storage capacities of the 32:16 are generous, Fortune offers a selection of expansion cabinets for future growth. Beginning at

only); Fortran, Pascal and C each list for \$495. A wide selection of communications software is cataloged at prices from \$195 to \$695 per package.

The Idol database manager will cost \$595; the For:Word word processor, \$495. The Multiplan spreadsheet planner is shown at \$295. Seven different busi-



*The distinctive design of the Fortune hardware sets it apart from the average-looking desktop computer.*

a price of \$750, these can be utilized to add floppy or hard disk drives as well as cartridge tape units.

Fortune's own terminal lists for a very competitive \$1,095. It's a full ASCII intelligent display terminal and keyboard that could be easily connected to many brands of computers. Dot-matrix printers are available from \$845 to \$1,395, depending upon speed required. Similarly, a range of letter-quality printers can be purchased from \$1,895 to \$3,195.

Other than the single-user Unix operating system, all software on the 32:16 is priced separately. A multi-user upgrade runs \$495; the Basic interpreter another \$295. Cobol costs \$795 (\$495 for the runtime version

business applications programs are available at a price of either \$395 or \$595 per module. All of these are written in Basic; most utilize Idol. □

*Technical Editor Tom Fox has authored over 50 articles and editorials for IA since May, 1979. He has spent his entire 21-year career in the field of electronics; with the last 14 years devoted to computer systems and their application to business and industry. He is President of FoxWare Systems Corp. (Irvine, CA), a firm specializing in the integration of microcomputers and applications software for small business users.*