

BYTE LINES

News and Speculation About Personal Computing

Conducted by Sol Libes

IEEE S-100 Standard Is On The Way: The IEEE-696 Standard for the S-100 microcomputer bus has been completed by the working group and submitted to the IEEE (Institute of Electrical and Electronics Engineers) Computer Standards Committee for adoption. Formal acceptance is expected by early 1982.

The S-100 bus has been changed radically from its original implementation in 1975 by MITS, who employed the bus in the Altair 8080 microcomputer. New features include 8- or 16-bit-wide data path (to accommodate the new 16-bit microprocessors), direct-memory addressing of up to 16 megabytes (previously 64 K bytes), direct I/O (input/output) addressing for as many as 65,536 ports (previously 256 ports), a new protocol that can handle 16 masters on one bus, timing specifications for 6 MHz clock operation (some manufacturers envision operating at over 10 MHz), and an expanded interrupt system of up to 11 lines (previously 7).

The standard will dispense with pin assignment and timing conflicts that plagued S-100 users because of variations between manufacturers. It also allows for future expansion of the bus to support changes in the state of the art (e.g., 32-bit microprocessors).

The importance of the standard is that there are almost 40 manufacturers of S-100 systems and about 50 others making hundreds of S-100-compatible products. There is no doubt the IEEE 696/S-100 is presently the

most powerful microcomputer bus in wide use.

If you would like a copy of the proposed IEEE-696 Standard, write to Sol Libes, IEEE-696 Committee Secretary, POB 1192, Mountainside NJ 07092. Please note that each copy costs \$6 in the US and \$8 elsewhere (US funds only).

Japanese Find Moving Into US Computer Market Hard: The Japanese are starting to move into the US small-business-computer market in force, but they're finding it more difficult than expected. The Japanese appear prepared for a long-term commitment: most are setting up dealer organizations and developing software packages for their hardware. However, it is becoming evident to the Japanese that their hardware is suited to the American market but their software is not. Because of this, it is likely that their penetration will take two to three years to become significant.

Although NEC (Nippon Electric Corporation) has been selling systems in Japan for more than two years, it has met resistance from American dealers because of a lack of software applicable to the US market. NEC is recruiting software suppliers to overcome this problem.

Mitsubishi introduced its small-business computer in the US in 1979 and boasted that within three years it would have 10% of the market. Now Mitsubishi realizes that the US market is hard to crack. It, too, has met with considerable resistance from

dealers and is attempting to have several software packages developed.

Toshiba has taken another tack by opening two computer stores in the Los Angeles area. The stores carry Toshiba's entire line of office products, including its desk-top computer.

Sony appears to be having problems delivering its Series 35 word processor, which was introduced at the beginning of the year. Also, it only just started shipping samples of the new 3½-inch disk drive to OEMs (original-equipment manufacturers). Rumors abound about a Sony personal computer, but none has yet surfaced either in the US or Japan.

Canon has decided to play the role of an OEM, thus passing its CX1 desk-top system's software problems on to distributors. (The CX1 is based on Motorola's 6809 microprocessor.) Canon has disclosed an agreement with a software supplier for seven accounting packages.

Sharp has introduced the YX-3200 small-business system to the US market. It had been sold previously in Japan. For the US version, Sharp has decided to go with Digital Research's CP/M operating system and the software packages currently available to operate under it. Sharp plans to sell the YX-3200 through systems houses, office-machine dealers, and office-supply houses.

Half-Size 5-Inch Floppy Drives Coming: At least three floppy-disk makers will soon introduce 5-inch floppy-disk drives that are only 2½ inches tall

(half the height of a standard floppy disk). It will be possible to fit two drives in the space previously occupied by one.

The first "slimline" drive is expected to be introduced by Alps Electric Inc (a Japanese concern). It's actually less than half-size, being only 1½ inches high. It will be available in 125 K- and 250 K-byte versions. Remex, Irvine, California, is expected to have its 2½-inch-tall drive out by year's end. The Oyx division of Exxon is making a half-size drive that's already being used in a smart typewriter.

Microprocessor Makers To Add Floating Point: Intel, Motorola, and Zilog will soon be adding floating-point functions (FPFs) to their 16-bit microprocessors. All three will use separate integrated circuits functioning as coprocessors. Intel is already providing samples of its iAPX 86-20, which contains both the 16-bit 8086 microprocessor and the 8087 numeric processor; production is expected to begin early next year.

Motorola plans a coprocessor for its 16-bit 68000 microprocessor but, in the meantime, will supply an FPF firmware package that allows 32-bit multiplication and division. Both Intel and Motorola will conform to the proposed IEEE (Institute of Electrical and Electronics Engineers) FPF Standard. Zilog is rumored working on an FPF device for the Z8000. It should be announced by year's end.

Japanese Robotics Industry On The Upswing:

The Japanese government is subsidizing its nation's robot makers in the same way that the computer industry was backed ten years ago. In April 1980, the Japan Robot Leasing Company was launched. After one year of operation, it is already renting \$5.5 million worth of robots and expects to raise this to \$12.5 million by the end of next year.

Japanese robot production last year totaled \$375 million and is projected to rise to \$1 billion by 1985. Last year, only 3% of robotic production was exported. One problem with these figures, however, is that they include human-operator manipulative and pick-and-place machines.

About 40% of the robots are used in the automobile industry, about 20% in electrical machinery manufacturing, and about 10% in plastics molding. There are an estimated 130 robot manufacturers in Japan.

Local Networks ... What's Up?

Xerox is staking a big pile of money on the "office of the future" concept using its Ethernet local networking system. The system is intended for lawyers, engineers, analysts, and other professionals wishing to zip documents, data files, graphics, and so forth between offices. Xerox has introduced several pieces of Ethernet equipment of which the latest is the Star workstation. The Star can be used as a stand-alone system or as a communications device between other Stars, file servers, and even non-Xerox equipment via an Ethernet system.

The Star is very impressive. Xerox has invested a

great deal of energy in developing a workstation with a highly intelligent user interface. In fact, a user can know next to nothing about computers and still use it proficiently because a four-hour machine-guided set of lessons is provided.

Star's most striking feature is its high-resolution video display that shows you two pages, side by side, exactly as they will appear in hard copy. You can vary character fonts, size detailed graphics, change gray tones, justify columns, move text on the screen, look into separate areas of different documents, and more. Using a standard keyboard, it has a free-roaming cursor controlled by a "mouse" and uses small graphic symbols to signify functions. No particular language is needed to tell the system what to do.

There is no doubt that the Star is ahead of the times—perhaps too far ahead! Despite support from several other vendors (Intel, Digital Equipment Corporation, and Hewlett-Packard), there is still no standard for exchanging information via Ethernet. At this time, the IEEE Local Networking Standard Committee appears hopelessly deadlocked. So there is no guarantee that a file created on an HP (Hewlett-Packard) computer, for example, will be compatible with Star's file-handling capabilities.

Even bigger problems are looming: each week there seems to be another new local-network system announced. Also, some of the personal-computer makers have indicated that they will introduce their own network systems, which, undoubtedly, will be non-Ethernet-compatible. Thus, we appear headed for chaos, where there will be neither hardware nor software compatibility among vendors.

On top of all of this, local networks are expensive: the Star workstation costs \$17,000. The Ethernet coaxial cable costs an estimated \$2 per foot, plus installation, and an Ethernet file server is more expensive than the Star. Hence, a Xerox Ethernet system appears to be prohibitively expensive for a small business. It is interesting to note that Xerox's new 820 system, with an under-\$3000 price tag, does not include any Ethernet interfacing (of course, it could be introduced as an option).

Everyone is watching to see how well Xerox will do with Ethernet. You can be sure that several manufacturers have networking systems in advanced stages and, if they feel it is worthwhile, will quickly jump into the marketplace. This includes IBM, DEC, several personal-computer makers, and the Japanese.

Data-Processing Lawsuits and Awards Increasing:

An estimated 600 computer-related lawsuits are before the courts. This is expected to surge up to 5000 by 1985, placing them second only to personal-injury cases.

A typical computer lawsuit costs a company \$500,000 and takes seven years to complete. Most cases are the result of an adverse relationship between users and vendors. Users appear to be ignorant of what they are buying and expect the vendor to furnish a system to meet all their requirements, but vendors only offer standard systems. So there is a wide gulf between user expectations and vendor capabilities.

Other causes are poor machine reliability and poor system performance. Many suits involve undercapitalized small systems, soft-

ware, and consulting firms that would rather sell the wrong machine or software package than to lose a sale. But vendors counter that purchasers are infatuated with the best and fastest hardware rather than concerning themselves with the problems to be solved. Also, many vendor contracts contain phrases that may waive warranties.

In a recent court case, NCR (National Cash Register) was ordered to pay the Glovatorium (a wholesale suede and leather cleaner) \$2.3 million. The jury found NCR guilty of willfully selling the Glovatorium a mini-computer package it knew would not work. NCR claimed that it was protected from some of the award by a nonconsequential damages clause in the user contract. The judge overruled the clause, which held that NCR was not liable for any loss of business, profits, or consequential damages suffered by the user.

Newspaper Guild Wants Video-Display Terminals Probed:

The president of the Newspaper Guild, Charles A. Perlik Jr, has urged a congressional subcommittee to back testing of possible long-term effects on operators of video-display terminals. Perlik conceded that tests performed by the National Institute for Occupational Health and Safety have found the radiation to be minimal; however, he claimed that the incidence of cataracts among video-terminal users at newspapers was unusually high. He asserted that the test included only a small number of terminals in use. The Guild has arranged for the Mount Sinai School of Medicine to conduct a "wide-ranging study."

Computer Crime On The Rise:

Two recently reported crimes involved computers. In the first, a student at San Jose State University was arrested and charged with unauthorized access to systems throughout the state and possibly other countries. The student illegally bypassed the school's security system and used the time to play games with other students, some as far away as Sweden and Taiwan. In the process, he accumulated more than \$7000 in long-distance telephone bills. He was also accused of erasing programs belonging to other students.

In the other case, a former programmer in Louisiana was arrested after admitting that he stole more than \$100,000 in money orders from a system he had programmed. The programmer had been retained by a software house to remove bugs from a software package being prepared for a customer. In the process of "fixing" the program, he altered the software so that he could write checks that were ignored by the system; consequently, the losses were not revealed.

Computer Science Graduates Command High Starting Salaries:

According to a survey conducted by the College Placement Council, this year's computer science college graduates commanded an average starting salary of \$20,000. Only engineers—particularly petroleum specialists—earned more (averaging \$26,000).

UNIX Vs CP/M: There is no doubt that CP/M is the de facto standard for 8-bit microcomputers. It has been implemented on virtually all 8-bit machines, including the

TRS-80, Apple, Heath, Xerox, Wang, Hewlett-Packard, and many of the new Japanese desk-top microcomputers. However, as we move into the 16-bit machine and multiuser/multiprocessing era, CP/M's supremacy is being challenged by UNIX-like operating systems. The battle as to which will be dominant on 16-bit systems is just beginning to develop, and I estimate that it will take another year or two (or possibly three) to determine the victor, if indeed there is one. The battle of words is already raging within the Department of the Army's Readiness Command (DARCOM), in magazines, and on several bulletin-board systems.

The arguments: CP/M currently exists in only one unique version (2.2), compared to at least five versions of UNIX, with more to come when "UNIX-like" systems actually hit the market. UNIX is a multiuser system, while CP/M is a single-user system. File size on UNIX is limited to 1000 megabytes, for CP/M it's 8 megabytes, but both support random-access files. Currently, UNIX runs only on PDP-11-based machines, while CP/M runs on 8080-, 8085-, 8088-, 8086-, and Z80-based machines. UNIX employs a tree-directory structure with an infinite number of levels and path names, whereas CP/M has a dual-level directory structure with a limited path. Both systems allow linking files. There is complete device transparency and redirectability with UNIX, but this is limited in CP/M. UNIX's user interface is contained in a "shell" that is easily replaced. CP/M, however, uses a command control processor that is not easily replaced. UNIX has a complicated command language in comparison to CP/M. UNIX's commands

have redirectable I/O (input/output). Only terminal I/O is redirectable in CP/M. UNIX has more extensive wild cards in addition to interprocessor information transfer (pipes) and coroutines, both of which are lacking in CP/M. UNIX has type-ahead, while CP/M may not. UNIX allows parallel processes but CP/M does not. CP/M is limited to 20 arguments, yet UNIX allows indirect command files with no limit to arguments. Conditional and construct execution of files are permitted only in UNIX. Also, UNIX allows shell variables and command substitution that CP/M does not provide.

Both have proven reliability, but UNIX provides better security. UNIX is written in the C language, and CP/M is written in PL/M and assembler. CP/M appears to have much more public-domain and commercial software available for it than does UNIX.

IBM Market Share Eroding:

In 1956 when 100% of the computer industry was geared toward big mainframes, IBM shipped 55% of all the data-processing equipment and had a handful of competitors. With the introduction of the minicomputer in 1972, the number of competitors increased to over 600. Last year, because of the microcomputer, the number of computer manufacturers rose to 3000. Although IBM has introduced mini- and microcomputers, its share of units shipped has dropped to 25%.

Random News Bits:

Digital Equipment Corporation claims to have more than 100,000 LSI-11 microcomputers in operation. . . . Advanced Micro Devices

and Mostek are developing integrated circuits that should reduce the cost of an Ethernet interface from the current \$1000 to under \$100 by 1983. . . . Seagate Technology, Scotts Valley, California, has introduced a 12.76-megabyte version of a 5-inch Winchester-disk drive. . . . For the second year in a row, Fujitsu reported greater computer sales in Japan than IBM (\$2.8 billion compared to \$1.6 billion). But IBM reported greater net income (\$174 million to \$88 million). . . . A recent letter in the *New England Journal of Medicine* reported on a new malady termed "Space Invaders wrist." The symptoms were a reported stiffness and pain in the right wrist. The cause was traced to "a large number of rapid, repetitive arm movements" required to play the Space Invaders game. The optimal treatment is rest. . . . Japanese integrated-circuit makers expect to produce 2 million 64 K-bit dynamic memories per month by year's end. . . . The largest disk drive yet is being developed by Ibis Systems, Duarte, California: 5 gigabytes. . . . A four-color miniature printer that uses 2¼-inch-wide paper will be offered by Alps Electric, Rockville Center, New York. It will cost only \$300. . . .

Random Rumors:

Digital Reserach of Texas' Big Board single-board microcomputer is rumored to be the heart of the Xerox 820. . . . Xerox is reportedly considering the introduction of an under-\$1000 personal computer. It has already built a prototype containing a Z80, 16 K bytes of programmable memory (expandable to 256 K bytes), 64 K bytes of read-only memory, an 80-character by 25-line color display with

System Log

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graphics capabilities, radio-frequency modulator, and liquid-crystal display. . . . The Apple IV could be released within the next few months. . . . IBM is said to be negotiating to implement BASIC and a VisiCalc-like package on its Displaywriter word-processing system, thereby acknowledging that it is really a general-purpose computer. . . . Expect about ten Japanese suppliers to enter the 5-inch hard-disk market by the end of next year, which should cause a softening of prices. . . . Rumor has it that a subset of Xerox's Smalltalk has been observed "chatting" at Apple Computer. . . .

MAIL: I receive a large number of letters each month as a result of this column. If you write to me and wish a response, please include a self-addressed, stamped envelope.

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BYTE's Bits

Logo License Applications Available

The Massachusetts Institute of Technology has announced that it is accepting applications from software distributors for the licensing of the Apple Logo Educational Software System. A review of the prototype of the system is available in the June 1981 BYTE (see page 36). Companies interested in further licensing information should contact: Patent, Copyright & Licensing Office, MIT, 77 Massachusetts Ave, Rm E19-722, Cambridge MA 02139. ■