

## News And Speculation About Personal Computing

Conducted by Sol Libes

### **UNIX Standard Called For:**

"/usr/group" is a newly formed group for users of UNIX and UNIX-like operating systems. At a recent group meeting, a Western Electric representative disclosed that his company has granted approximately 156 commercial licenses at about 244 commercial sites. Many present at the meeting complained about Western Electric's excessive charges for unsupported software. The company typically charges \$12,000 for a single processor license and as much as \$40,000 for users of the DEC (Digital Equipment Corporation) VAX machines.

UNIX users, now faced with many different implementations of UNIX, are beginning to be concerned with standards. To help cope with the problem the group plans to issue a *UNIX Users Guide*.

Also at the meeting, Microsoft announced plans for implementations of its Xenix package on the Texas Instruments TI9900, IBM Series/1, and Point 4 Data Corporation systems.

For more information write, /usr/group, POB 8570, Stanford CA 94305.

### **UCSD Pascal 4.0 To Be Released:**

A new version of UCSD Pascal will soon be released by Softech Microsystems. The good news is that Pascal 4.0 will have many new features, such as multitasking and better screen handling. In other words, it will be more flexible, do more jobs, and be generally more powerful.

The bad news is that it will generate code that includes four new p-code instructions. Hence, the Pascal MicroEngine, presently the fastest available Pascal

system, will not be compatible with the new 4.0 version. Of course, WD (Western Digital) can recode the MicroEngine microcode ROMs (read-only memories) to include the new instructions, but I don't know. Considering that it took WD nearly a year to come out with the present ROM set, I do not foresee the possibility of MicroEngine Pascal 4.0 for some time yet.

### **Voice Entry System For The Apple:**

Scott Instruments, Denton, Texas, will introduce an Apple version of its voice entry system. To be called "AppleVet," this system will be able to recognize as many as 680 words or utterances. An \$895 price tag for the system will include a plug-in board, a noise-canceling microphone, and demonstration disk.

### **Voice-Operated Telephone Dialer Tested:**

Bell Labs, Murray Hill, New Jersey, has disclosed that it is testing a telephone dialer that is voice operated. The caller can ask for a 4-digit telephone extension or a name in the directory of the system, and the system will then dial the number. The dialer has already demonstrated a high reliability. If in doubt as to what it is told, it asks the caller to repeat the entry.

The system uses a high-speed array processor attached to a minicomputer to detect the presence of speech and identify voice features to be used by a word recognizer. The word recognizer compares the features of the utterance to a subset of stored features

and generates a word-candidate list, which is ordered according to the probability of the word's occurrence. The system uses a feature template of the caller's voice, learned during a training period, to recognize the caller's voice input and dial the number. The system recognizes only isolated word inputs, and the user must speak slowly and haltingly.

### **Where Are The 64 K-Bit Memory ICs?**

At one time, memory size quadrupled every two years. But four years have now elapsed between the introduction of the 16 K-bit and the 64 K-bit memory ICs. Skyrocketing development costs and difficulties in working with such dense devices have caused most of the delay. It is likely that the next quadrupling will take even longer.

Over two dozen suppliers are now delivering samples of 64 K-bit programmable memories to computer manufacturers; some of the samples are already in limited production. You can expect to see the first products using 64 K-bit integrated circuits in the third or fourth quarter of this year. However, do not look for their widespread use until sometime in late 1982 or 1983, when prices should drop to under \$10 each.

American memory manufacturers are extremely concerned about Japanese competition in this area, however. The first company to supply 64 K-bit circuits was Fujitsu Ltd, and eight other Japanese manufacturers are jumping in too. Some manufacturers fear that the Japanese may snare 60% to 70% of the

64 K-bit memory market. If this occurs, the entire American computer industry may find itself in trouble.

### **Apple Stock Goes On Sale:**

Shares in Apple Computer Inc, one of the most eagerly awaited public stock offerings, went on sale early in December 1980. Apple offered 8% of the company's 52.4 million shares (ie: 4.6 million shares) at a price of \$22 per share.

Apple, incorporated in 1977, reported profits of \$11.7 million on sales of \$117 million for the fiscal year ending September 26, 1980. 1979's earnings were \$5 million on \$48 million sales, and, in 1978, sales were \$7.8 million with profits of \$793,497.

Steve Jobs, 25 years old, and Steve Wozniak, 30 years old, the creators of the Apple computer, each hold 8.3 million shares. That means that they own well over \$100 million worth of stock. A C Markkula, 32 years old, who took Apple from a garage operation to its current enviable position, also holds 8.3 million shares. Venrock Associates, a venture capital firm, holds 3.8 million shares. Significant blocks are held by several other venture capital concerns. Xerox holds 80,000 shares.

### **Status Report On The IAPX-432:**

Late last spring, Intel announced its iPAX-432 32-bit microprocessor with great fanfare. At that time, only very general specifications were released and subsequently reported on in this column. (See "Intel Releases Data On 32-Bit Microproces-

sor," August 1980 BYTE, page 94.) During the fall, however, Intel made large-scale presentations to several major systems-level houses. Rumor has it that Intel will deliver a paper at the International Solid State Circuit Conference (ISSCC) this month, in which it will divulge full details on the architectural design of the iAPX-32. Intel should start delivering samples within another month or two.

The iAPX-32 is a 3-chip set that uses more than 100,000 transistors per IC (all 64-pin packages). The design of the instruction set is aimed at supporting high-level compiled programs written in Pascal, Ada, and FORTRAN.

Intel had also let it be known that it planned to supply microcoded firmware in the processor device that would directly execute the Ada high-level language. However, rumor currently has it that Intel is retreating from this concept.

## **S**tatus Report On 16-Bit Microcomputers:

The 16-bit scene matured during 1980. Intel sold about 200,000 of its 8086 devices (at well over \$100 apiece, Intel appears already to be profiting from this unit). By midyear, Zilog had managed to remove the bugs from the Z8000 and, by year's end, was in full production. Motorola must be given credit for designing the most powerful 16-bit microprocessor (imagine having seventeen 32-bit-wide registers and 23-bit addressing to reach 16 megabytes of memory directly). It must be considered a landmark achievement that Motorola was actually shipping limited production quantities of fully functional 68000 devices by the end of 1980 that met specifications. This is particularly impressive when you consider the number of elements in the device (about 70,000) and the large size of the silicon chip (246 by 280 mils).

In production now for two years, the 8086 is just beginning to develop a respectable software base. For example, Digital Research is starting to supply an 8086 version of CP/M. The software bases for the Z8000 and 68000 are still extremely limited and are probably more than a year behind the 8086 software base.

National Semiconductor expects to start shipping samples of its new 16032 16-bit chip set, which promises features similar to the DEC (Digital Equipment Corporation) 32-bit VAX machines. The silicon area on this device (250 by 300 mils) is even larger than Motorola's 68000. Industry observers concede that this set of devices is significantly more powerful than the 68000, the Z8000, or the 8086. However, many observers doubt whether National will be able to compete with Intel, Zilog, and Motorola, because of its late start and the great expense of such a project.

## **S**ovlets Develop 8080A-Like Microprocessor:

According to a technical report released by CDC (Control Data Corporation), the Soviet Union is manufacturing a microprocessor that is very similar to Intel's 8080A design. Control Data obtained samples of the integrated circuit from the Hungarian government, and promptly dissected it. They discovered that the device, called the K801K80.77, uses the same circuit blocks as the 8080A, except that it is adapted for the NMOS (n-channel metal-oxide semiconductor) process.

In the manufacturing process, Soviet technicians relaxed line widths and geometry separations and used a larger chip size (214 by 192 mils, compared to 193 by 171 mils for Intel, which Intel later reduced to 165 by 161 mils). The Soviet design is thus more conser-

vative and more expensive to produce. CDC identified several "workmanship flaws" in the devices (eg: questionable die attachments and scraping of bond wires). CDC felt that the Soviet technology was equal to American technology, vintage 1977. The device uses a 48-pin package with eight unused pins.

## **H**ome-Banking / Information System Inaugurated:

Radio Shack, CompuServe, and United American Service Corporation have joined forces to inaugurate a nationwide home-banking and information system. (See "You Can Bank on It," January 1981 BYTE, page 10.) Using the new TRS-80 Color Computer, a television receiver, and a modem, a subscriber will be able to pay bills, obtain a bank statement, do bookkeeping, apply for a loan, send and receive electronic mail, and access the CompuServe data base. The service will cost between \$15 and \$25 a month. United American expects to have forty banks and 20,000 subscribers in the system by the end of the year.

## **D**igital Research To Introduce Record-Retrieval System:

Digital Research (DR) will soon introduce a record-keeping software package called BT-80. Basically, it is the kernel for a data-base management system. DR has also indicated that it is "taking a hard look at possibly implementing CP/M, MP/M, and PL/I on 68000 and Z8000 systems." Further, they have purchased a Digital Equipment Corporation VAX machine. Although this machine is primarily intended to keep track of their internal operations, it will be using the UNIX operating system. Does this mean that DR might be taking a close look

at UNIX? After all, several DR staffers have strong UNIX backgrounds.

Digital Research has also disclosed that it is considering the possibility of developing a software interface between CP/NET and the EtherNet systems.

## **T**he Microprocessor

**Catch-22:** Intel is currently the only supplier of the 8088 microprocessor (which is actually a 16-bit 8086 with 8-bit input and output). Most designers tend to avoid a part that is not "second-sourced." In other words, they want to be able to get the part from another source if their primary source has delivery problems. Mostek has said that it is interested in second-sourcing the 8088 if demand warrants. My question is, how is the demand to materialize while waiting for a second-source to enter the marketplace?

## **R**andom Bits And Random Rumors:

The EtherNet's specifications have been finalized and published. If you would like a copy, contact the EtherNet Literature department at either Xerox, Intel, or Digital Equipment Corporation.... NEC is about to introduce a low-cost version of its Spinwriter word-processing printer. This new machine will sell for \$1400 (in lots of 100) and it will also be used with a new NEC microcomputer system rumored for introduction later this year.... It is being whispered that Epson America Inc, Torrance, California, will soon unveil a low-cost daisy-wheel printer.... Ontrax Corporation, Sunnyvale, California, plans to introduce a 116-megabyte 8-inch Winchester disk drive soon.... Before long, General Instrument will place on the market a speech-synthesis chip set in the \$5 price range for large volumes. The set will include the controller, 32 K bytes or 128 K bytes of ROM and speech modules....



Hewlett-Packard is about to set forth a single-board microprocessor version of its 1000-L computer to compete with the Digital Equipment Corporation LSI-11.... Control Data plans to introduce a self-contained PLATO system. The PLATO system is currently a mainframe-based system that includes remote terminals with high-resolution graphics and an extensive library of interactive educational software.... Shugart Associates, the current leader in floppy-disk drives, is rumored to be developing an optical disk-storage system. The basic technology for this system was developed by Shugart's parent organization, Xerox, and Thompson-CSF....

**F**irst **Xenix/Z8001 System Announced:** Tri-Data Systems, City of Industry, California, is the first company to announce a microcomputer system using the Zilog Z8001 and Microsoft's Xenix operating system. The Z8001 employs segmented rather than direct addressing. This desk-top system, called the SST, contains a Z8010 memory-management integrated circuit that dynamically relocates

code and protects memory areas. The SST utilizes a ten-slot motherboard for memory expansion in 128 K-byte modules.

## Will Microcomputers Leapfrog Over Minicomputers and Mainframes?

The newer 16- and 32-bit microprocessors, soon to be sampled by integrated-circuit manufacturers, will contain some new and sophisticated features. For example, the forthcoming NS16000 16-bit microprocessor from National Semiconductor and the iAPX-432 microcomputer from Intel will both have true virtual memory capability that will allow very large memory systems. Sixteen-bit microcomputers like the 8086, Z8000, and 68000 do not lend themselves to virtual memory systems. Intel, however, says that it expects to have an 8086 with virtual memory later this year.

Virtual memory requires the microprocessor to stop in the middle of an instruction if it determines that the address called is not in memory, back up execution of the instruction, and restart the instruction after the contents of that virtual address have been brought in from a

mass-storage device (eg: a hard disk).

Returning to the original question, experts concede that, simply because microcomputers now have features once found only in larger machines, it does not follow that they will overtake minicomputers and maxicomputers. Each year the minicomputers and maxicomputers add performance features that keep their power far ahead of microcomputers. In fact, the new more powerful microcomputers now have features that were found in larger systems five or more years ago.

## Robot Kit Announced:

In the December 1979 BYTE News, I predicted that a robot kit would be introduced in 1980. It now seems as if that prediction will come true in 1982. Heath Company recently demonstrated a 3-foot-high robot prototype to Heath retailers that it plans to introduce in 1982. The robot kit will use the Motorola 6802 microprocessor with 4 K bytes of programmable memory and 32 K bytes of ROM (read-only memory). It will have a detachable

joystick, voice synthesis, and one multipurpose arm. At this time, it is projected that the kit will cost less than \$1000.

## Change Of Name:

Seagate Technology is the new name for Shugart Technology. Seagate Technology is the Scotts Valley, California, firm that manufactures Winchester-technology 5¼-inch hard-disk drives. The decision to change its name was made by Seagate Technology to help distinguish it from the famous maker of floppy-disk drives, Shugart Associates. Both companies were founded by David Shugart. However, Mr Shugart is no longer affiliated with Shugart Associates.

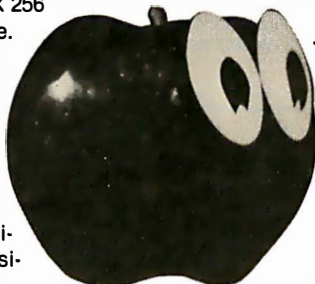
**MAIL:** I receive a large number of letters each month as a result of this column. If you wish a response, please include a stamped, self-addressed envelope.

Sol Libes  
POB 1992  
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