Typesetting on Personal Computers

The Sperry IT: An IBM AT Compatible

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The high speed of the Sperry IT makes TEXing and previewing comfortable — far more comfortable than on a PC-class machine. A complete system, using the Sperry system unit (with its fast 40 megabyte hard disk, and 1 Mb of RAM), in conjunction with non-Sperry keyboard, monitor, and Hercules-compatible video card, costs about $3,400.

The System unit: Because TEX is a computation-intensive program, the processing speed of your system is important. Processing speed is determined by two factors: the clock frequency, and the number of wait states required by the system.

The higher the frequency of the system clock, the faster the system. The clock in the original IBM AT ran at 6 MHz; the version released in April 1986 runs at 8 MHz. The Sperry's clock can be switched to 6, 7.16, or 8 MHz.

The second consideration is the number of wait states used: in some machines, the computer's memory can't cough up the information requested by the processor fast enough, forcing the processor to wait. To indicate the delay to the processor, the system introduces one or more wait states. Each wait state degrades the system's performance by 25%.

Both versions of the IBM AT use one wait state. The Sperry uses one wait state in the 6 and 8 MHz settings, but runs with no wait states at the 7.16 MHz speed. This means that the 7.16 MHz speed is the fastest of the Sperry's three speeds, and at this setting, it will out-perform the 8 MHz IBM AT.

For comparison, a 6 MHz AT is two to three times faster than a 4.77 MHz PC; an 8 MHz AT is 33% faster than a 6 MHz AT, while the Sperry, at 7.16 MHz, is 45% faster than a 6 MHz AT.

When using the Textset Preview program, the bottle-neck is disk access. Fortunately, the Sperry is equipped with a fast hard disk (30 ms access time). With this disk, the performance of the preview program becomes acceptable — on slower systems, I

find that the performance of the preview program (version 2.1) is uncomfortably slow.

The system unit also includes: two serial ports, one printer port, a 1.2 Mb floppy-disk drive, MS-DOS 3.1, GW-Basic, diagnostic diskette, six available slots (after installing the video card): one 8-bit only slot, and five 8- or 16-bit slots, reset switch, one-year warranty, and manuals (including a setup guide). Technical reference manuals are available.

Important: Sperry currently ships the IT with either a 44 Mb drive made by Miniscribe, or a 40 Mb drive made by CDC. Because I've heard of reliability problems with the Miniscribe 44 Mb drive, specify that the drive in your system not be from Miniscribe. Also specify that the serial number be greater than 414001, ensuring that you receive the latest version of the system: unlike the older version, you can now defeat the serial ports and printer port (necessary if you can't defeat the ports that may be present on other cards you install in the system). The BIOS in the current systems is version 1.48, and corrects problems relating to access of the floppy-disk drives (you can ascertain the BIOS version by running the `romver` program). Also in the current system, the optional math co-processor can run at 8 MHz. (The serial number and drive manufacturer are marked on the outside of the box. A leading digit of '4' in the serial number indicates that the hard drive was installed by Sperry.)

Configuring the System: A limitation in DOS is its inability to access more than 32 Mb on a hard disk. To circumvent this, Sperry allows you to treat the 40 Mb drive as if it were two (or more) drives, each with a separate drive letter. These pseudo-drives will total 40 Mb, and you can specify a size of up to 32 Mb for a pseudo-drive.

The 1 Mb of RAM on the motherboard can be configured in two ways: it can be split into two 512 K segments, with one segment for running programs under MS-DOS, the other segment for use as a ram-disk; or, 640 K can be used for program memory, but then the remaining memory becomes unavailable, and is wasted.

The 512 K/512 K split is handy for users of Personal TEX's Cordata (formally Corona) laser printer driver, as the driver requires a 512 K ram-disk. Squeezing TEX into the other 512 K segment may require some care: you may need to forgo use of RAM-resident software, reduce the number of buffers specified in the `config.sys` file (I normally use 64 buffers on the Sperry), and eliminate device drivers from the `config.sys` file.

Eliminating device drivers has its drawbacks: a device driver is needed by the Sperry to access the part of the hard disk beyond the 32 K DOS limit; also, the ansi.sys driver is needed by the Textset Preview program — without it, the screen goes blank when you exit the program, until you type the cls command.

To avoid these difficulties, you'll want to increase the system's memory — this requires the installation of a RAM card. AMI manufactures RAM cards that do work properly in the Sperry, and cost about $300 — be sure to request the PAL chip for using the card in a Sperry. These cards do not insert wait states. When ordering RAM to populate the card, specify an access time of 150 ns. (The Mitsuba RAM card, designed for the IBM AT, was rejected by the Sperry's power-on diagnostics. I've also heard that the AST RAM card will not work.)

Compatibility: No problems with TEX-related software or editors. Many games will not run. Jet, a flight simulator, works in Hercules mode. Symphony requires a math co-processor. The current Hayes internal modems will work, but the older versions will not.

Support: The Sperry support center, 800-328-1015, is staffed by knowledgeable, helpful representatives.

My dealings with one service center showed that location's staff to be eager to correct a problem in one unit; unfortunately, they released the unit before resolving the problem.

Sperry's corporate personnel proved to be conscientious and responsive.

Peripherals

The following recommendations on peripherals apply to other AT- and PC-class computers, including the ACS computer I discussed in volume 6, number 3.

Display: The most comfortable display I've used to date is the Panasonic TR-122MYP. It uses a long-persistence, lime-colored (QD) phosphor, which I find more restful than the IBM green display, or any of the amber displays I've used. (The current versions of the Taxan 122 display discussed in vol. 6, no. 3 no longer seems to have the long-persistence I originally admired.)

Display Adapter: Low-cost Hercules-compatible video cards use slow chips, and may have trouble working in fast machines. However, I did test one such card, made by Fortron, which did work in the Sperry. On special request, you can purchase a version of this card with a defeatable printer port — a necessity if you have a card in your system with a printer port that can't be disabled.

(In my system, I have a video card with a custom PAL chip that produces a non-blinking, inverse-video cursor. I find blinking cursors distracting — they make me feel that the "meter's running" as I plod along. I've seen ads for a program that claims to produce a non-blinking cursor.)

Keyboard: The good news is I've found a keyboard with an excellent, solid feel, in the AT layout, with a separate cursor pad as an option. (This keyboard can also be used on an IBM PC or compatibles.) Most keyboards (including those made by Key Tronic, and those sold by Sperry and Compaq) have a mushy feel — as though you're typing on a sponge (this isn't far from the truth: the capacitive keys used in most keyboards have a foam pad beneath each key). IBM's clacky keyboard is the opposite extreme: it feels as if you're breaking through egg shells as you type. One die-hard fan of IBM's keyboard expressed his preference for this new keyboard after a short period of use.

The bad news is that this keyboard isn't available through normal mail-order channels. But you can seek out other brands with the same touch: the keys use a hard-contact switching technology.

While the legends on some cheap keyboards consist of surface markings, which will rub off with use, the keycaps on this keyboard are made by two-shot molding: this means that the plastic that makes up the legend goes through the entire thickness of the top of the keycap. You can spot this type of keycap by gently removing a keycap and looking at its underside; if you can see an inner layer of plastic of the same color as the legend, then the keycap was made by two-shot molding.

Anti-Glare Screen: A new model of the Super-Screen (vol. 6, no. 3) incorporating a grounding mesh is now available. One potential advantage is that by discharging the static build-up, less dust should be drawn to the screen — dust that would gradually degrade the sharpness of the image, unless the mesh is frequently cleaned.

Surge Suppressors: See the results of comparative testing in *PC Magazine*, vol. 5, no. 10, pages 107–146, May 27, 1986.

Diskettes: Elek-Tek, 800-621-1269, sells a box of ten 1.2 Mb Dysan diskettes (a top-rated brand) for $33.