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Life in Modula-2

Conway's Population Simulator

Also:

Using JANUS/Ada

Ada Benchmarks on the Apple II®

Pascal Authoring System

Using the Sage II

And more!

Using the SAGE II

The Journal Staff Report on this Impressive 68000-based System

PRODUCT: Sage II
68000-based
Microcomputer
Two 640K floppy-disk
drives
128K directly-
addressed RAM
384K RAMDISK (virtual
disk)

MANUFACTURER:
Sage Computer
Technology,
4905 Energy Way
Reno, NV 89502

PRICE: \$5150.00
(system as listed)
\$3600.00 (one disk
drive; no RAMDISK)
(Other configurations
possible)

For the past three months, we have been using a Sage II computer in our office. The Sage comes with UCSD Pascal®, FORTRAN, a BASIC compiler, and a 68000 assembler. Of these, we have used the Pascal compiler exclusively. (Volition Systems' Modula and CP/M 68K are optionally available instead of the p-System®). We have also used the UCSD Pascal® editor for extensive word processing and have bothered the Sage staff at the Reno office with a lot of questions.

The Hardware

The small, dignified-looking Sage II is a powerful computer. It fits in a compact case: about four inches high, twelve across, and fourteen deep. The front of the

machine has only the two drives and a single LED that is usually red but turns green when the data bus is active. The back panel has RS-232 serial, parallel printer, and monitor ports. There is also an IEEE 488 port which is supported by a Pascal Unit for use in local network and device driving applications.

The performance of the Sage is wonderful. Sage graciously provided us the top of the line configuration (with two double-sided, double-density disk drives and half a megabyte of RAM). 128 K of the memory is directly addressed by the CPU, the remainder is configured as a virtual disk (RAMDISK). We have found this combination an efficient one.

The p-System® on the Sage

It is possible to set up the Sage's boot sequence so that the system files are all automatically loaded into the RAMDISK. This means that there is almost no delay between calling up any of the system tools, such as the filer or editor, from the main command line, and the appearance of the prompt for the system tool. It is gratifying to call up the filer and be able to use it immediately, rather than waiting for it to be read from a floppy disk and loaded into main memory.

I have had occasion to use an Apple® again after using only the Sage for several months. While I did not exactly become impatient waiting for the system to load the tools, I found myself able to check my notes or find a page in a manual while waiting for the tool promptline—I've been spoiled by the Sage.

While the access speed of the Sage's RAMDISK is amazing, the Sage's floppy drives have fast, efficient access as well. Even when the operating system files are read from a floppy rather than the RAMDISK, the system still steps quickly from one tool to another.

The Sage is of course equipped with the latest version of UCSD

Pascal® which has real-time and low-level access features. With a little help from Sage to find the right page in the documentation, we were able to write some fairly sophisticated programs to drive our modem. The operating speed of the Sage is fast enough that we can check to see if the modem is still detecting a carrier between each character sent to the modem. We suspect that this modem system will prove more reliable than the old system on the Apple® because of the frequent testing for error conditions.

Software Support

The Sage II comes with the p-System® Pascal, FORTRAN, BASIC, and assembly languages. It is also provided with a unique set of tools from Sage. These include utilities that may help you transfer files from another machine to the Sage, a configuring and formatting utility that sets all kinds of things you might expect to be able to do with DIP switches—or not at all, and a demo program that is fun to watch when you first pull the Sage out of the box and set it up.

Although we did not manage to transfer any code files from our old Apple to the Sage, we did use Sage's tools to transfer our text files and simply recompiled the programs we needed. Without the tools provided with the Sage, this would have been a real chore.

The menu-driven configuring and formatting utility is marvelous. This package, called "SAGEUTIL," does much more than format diskettes. SAGEUTIL can set the parallel port to run on interrupts or poll the port for a busy signal at intervals you set from the keyboard—no opening the case and fiddling with switches. SAGEUTIL can also set the disk drives to read disks other than the standard 80-track Sage format. We tried to read Apple® disks but that proved to be too much of a stretch for our drives. Depending upon the individual drive, you may or may not be able

to do it. 40-track, and IBM formats are supported and readable with better chances of success. SAGEUTIL also sets the parameters of the serial port.

Speed

It is marvelous to watch the Pascal compiler zip through a program. With both source and object files in the RAMDISK (and not writing a listing file), the Sage compiled the 786-line Formatter, published in vol. 1, no. 1 of the *Journal*, in 35 seconds—more than 1300 lines per minute. Even with both source and object files on a floppy, the compiler finished in 40 seconds—still almost 1200 lines per minute. (Another indication of the Sage's extraordinarily fast floppy access.) With both source and object files in the RAMDISK and a list file on one of the floppies, the Sage still managed 850 lines per minute. After agonizing over compilation on a slow machine, the Sage is most refreshing. It is not nearly so annoying to find a syntax error in the next-to-the-last procedure of a program when you know it will only take a minute to recompile the whole file.

Once we had our faithful Apple Pascal® programs transferred by modem to the Sage, they ran without modification. (We actually had to transfer the text files and recompile them because we had no way to transfer code.) Our programs for maintaining our mailing lists ran five times as fast on the Sage without changing anything. When we made some modifications to the programs to take advantage of the high access speed of the Sage II's RAMDISK, our sorting program ran ten times as fast on the Sage as it used to on the Apple II®. This is partly because of the lightening-fast response of the RAMDISK, partly the larger heap space available on the Sage, and partly the speed of the Motorola 68000 CPU.

Documentation

The documentation for the Sage comes in four looseleaf volumes (this includes SofTech's documentation for the p-System). As is often the case, it always seems easier to find something you

already know about than something you need to know to solve a sticky problem. We called Sage about things that we could have found if we had consulted the index. We like to think this might not have happened quite so many times if the index had its own little tab so that you remembered that there was one.

However, Sage's documentation is well-written and warns of potential problems with more candor than is often seen in hardware documentation. An example of this is the following line from the section on Computer System Intercommunication: "setting up a communication link over an RS232 channel ... is usually easier said than done. The number of details which must be coordinated usually require an experienced user." (The remainder of the section is devoted to explaining how to use the tools Sage provides to make system intercommunication as easy as possible.)

The portions of the documentation actually done by Sage (large parts are from SofTech) include some helpful cross-references—an important part of technical writing that is too often ignored in documentation. As usual, I think there could be more; but it is a pleasure to find a number of good cross-references—rather than the usual none.

Service Staff

Between some problems we had with our printer not receiving text correctly from the Sage and a few other things we might have answered ourselves if we had checked the manuals more carefully, we spent a lot of time on the phone with members of the Sage staff. You might say that they brought the simple questions on themselves by being so helpful with more difficult matters. With help from the Reno staff, we solved problems with an unstable CRT display, the printer interface, and a modem cable which did not have the right wiring (never trust an RS 232 cable—open it up and look at it at the first sign of trouble!).

We were pleased to receive considerate treatment from Sage's service staff. Nothing is more annoying than having a nice piece of

hardware that you cannot use effectively because the service staff is nonexistent or unfriendly. Sage provided professional, polite, and helpful service.

Potential Users

We have used the Sage II for everything from word processing to program development and it faithfully broods over the Journal Program Hotline each night without getting hot. The Sage is a versatile piece of hardware that could work in almost any application that did not call for multiple users (other Sage models support several users). The only objection to using the Sage in the home is its cost (and there may not be enough games available for it to keep the kids happy). It would certainly be appropriate for software development or business uses. The Sage II's speed, and ability to interface with a large number of external devices makes it ideal for research purposes as well.

John M. Craig
Journal of Pascal and Ada

NOTE: Watch for a review of Modula-2 on the Sage in an upcoming issue. Ed.