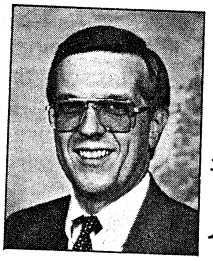
Richard Bilancia



THE TANDY XENIX MACHINES

Having owned a Radio Shack Model 16 since May 1982 and having run XENIX 68000 on it since January 1983 (I was a Beta test site for the original Version 01.00.00 release), I was anxious to see how Tandy's Model 3000HD running their release of XENIX System V/286 would compare. If you'd like to know what I found out after spending about a month with a Tandy 3000HD, please read on.

BACKGROUND

There is a fond place in my heart for the Tandy XENIX/68000 machines and operating system. The Tandy 6000 that I currently own, and used for this comparison, is really a Model 16A that has been upgraded to a 6000. Although it has been one of the most reliable computers that I've owned (in spite of a direct lightning strike on my office that put it out of commission for 7 weeks in the fall of 1984), I sadly acknowledge it has deficiencies that I'll detail here. It is, however, a real workhorse.

If you haven't read Bruce Mackinlay's "You Want Me to Review What?," a complete and accurate review of the Tandy 6000 published in the June 1986 issue of UNIX/WORLD, be sure to track down a copy.

Because each Tandy XENIX machine can be configured quite differently, Figure 1 shows the systems used for comparison in this article, as well as their entry-level and fully-loaded configurations. You should carefully note that my Model 16 (upgraded to a Model 6000) is nearly fully configured, and the Model 3000HD used in this evaluation has quite a bit more room for expansion, but is not basic Model 3000HD.

FIRST IMPRESSIONS

Having owned a Tandy XENIX machine based on the Motorola (Cupertino, CA) MC8000 CPU for as long as I have, I was really quite reluctant to even consider running XENIX on an AT-compatible computer. I must say, however, that I've been quite pleasantly surprised by the performance of the 3000HD and Tandy's port of XENIX System V/286.

Although the system I received already had XENIX installed on the hard disk, I chose to reload the software from the distribution floppies just to see how complete the documentation and installation programs are. They are very complete—not only are they more detailed than the original Model 16 installation instructions, which were quite limited, but they are even better than the current Model 6000 instructions (I also prefer the PC-sized, 5½ x 8½-inch manuals that come with XENIX for the 3000HD rather than the full-sized, 8½ x 11-inch manuals that come with the 6000). The 3000HD installation procedures allow the user to configure his or her primary hard disk into multiple partitions (not allowable on the 6000), to allow a portion of the primary hard disk to contain MS-DOS programs and data, and to modify the amount of disk swap space.

After installing all the software I received (including Tandy's bundled DeskMate interface, which I discussed in last month's column), I ran my favorite quick benchmark (see Figure 2A).

While no benchmark test can ever tell all things, this simple test includes the time to load the `grep` program, sequentially read a long

FIGURE 1: Tandy 3000HD vs. 6000 Hardware Comparison

TANDY 3000HD vs. 6000 HARDWARE COMPARISON

	MODEL 6000			MODEL 3000HD		
FEATURE:	**BASE MODEL**	**FULLY CONFIGURED**	**AS TESTED**	**BASE MODEL**	**FULLY CONFIGURED**	**AS TESTED**
MICROPROCESSOR	MC68000/Z80	MC68000/Z80	MC68000/Z80	80286	80286/80287	80286/80287
RAM	512K	1Mbyte	1Mbyte	512K	12Mbyte	2.6Mbyte
USERS	3	9	6	2	10[1]	2
FLOPPY DISK	1-1.25Mbyte 8"	4-1.25Mbyte 8"	2-1.25Mbyte 5¼"	1-1.2Mbyte 5¼"	2-1.2Mbyte 5¼"	1-1.2Mbyte 5¼"
HARD DISK	1-15Mbyte	4-70Mbyte	1-70Mbyte/1-35Mbyte	1-20Mbyte	1-40Mbyte/3-70Mbyte	1-40Mbyte
MONITOR	included	included	included	not included	$529.95	$529.95
VIDEO ADAPTER	included	included	included	not included	$399.95	$399.95
HARDWARE PRICE	$3499	$17,000+	$10,371	$3599	$16,000+	$6748.55
XENIX OS	included	included	included	not included	$595	$595
XENIX DEV.SYS.	not included	$750	$750	not included	$595	$595
XENIX TEXT PROC.	not included	w/Dev. Sys.	w/Dev. Sys.	not included	$175	$175

1. Up to 10 users can be configured (depending upon the applications running), but is not recommended by Tandy.

FIGURE 2A: The Quick Benchmark Test.

```
$ cd /usr/dict
$ time grep fast words
```

FIGURE 2B: Tandy 3000HD Benchmark Times

```
real    9.12
user    7.06
sys     1.59
```

FIGURE 2C: Tandy 6000 Benchmark Times

```
real    15.50
user     1.95
sys      2.79
```

file, do the regular expression comparison, and then display the output on the console device. Ten iterations of the test on the 3000HD averaged, (see Figure 2B); while on the same iterations on my 6000 averaged as shown in Figure 2C.

Needless to say, I was impressed!

MORE SPEED COMPARISON

I also ran the same test three and five times simultaneously to simulate a multiuser environment. The results are shown in Figure 3. As you can see, the "real" times increased proportionately (almost linearly), but in about the same proportions on each machine. The conclusion that I draw is that neither machine is more of a multiuser computer than the other. Also, I ran the traditional "sieve" benchmark program and got the confirming results shown in Figure 4.

OTHER DIFFERENCES

Most noticeable is the physical size difference between the two machines. The Tandy 6000 with two external hard disks occupies about 4.25 cubic feet. The Tandy 3000HD, on the other hand, occupies only about 2.75 cubic feet, over half of which is taken up by the oversized 14-inch CM-1 color monitor. Also quickly apparent is the difference in the level of noise generated by the two machines. In comparison to the noisy Model 6000 (caused by three fans: one in the CPU and one in each external hard-drive enclosure), the 3000HD is extremely quiet.

Then there are the keyboards. The Tandy 6000 was not originally designed to be a XENIX machine and the keyboard reflects this fact. Many UNIX shell characters require two keystrokes on the 6000 keyboard: the tilde, ~, is a control-6; the pipe character, |, is a Control-1 or Control-0; and the backslash, \, is a Control-/. Also, I thought that keyboard feel—a personal preference—was nicer on the 3000HD than on my Model 16A keyboard. (For the record, I do prefer the feel of the 16A keyboard to that of the actual 6000 keyboard.)

The only complaint that I have about the 3000HD keyboard is the positioning of the backslash, \ key right next to the backspace key. This often caused me problems with reading—and correcting—a shell input line because, as you probably know, the backslash protects the next character. When I would accidentally hit the backslash key in error, then try to correct the error by hitting the backspace key twice (once to erase the backslash and then again for the character I originally wanted to erase), the screen would show what I wanted but the original erroneous character would still be (invisibly) in the command line.

Both machines run more than one operating system, but not more than one at a time. The Model 6000 comes with XENIX 68000 and TRS-DOS, Tandy's proprietary single-user operating system that runs on the Z80 processor of the 6000. It can also run the CP/M single-user operating system, but I'm sure very few people run either TRS-DOS or CP/M on a Tandy 6000. Tandy does not provide a way of booting either of their two operating systems for the 6000 from a single hard disk; however, such a product is available from Snapp-Ware (Cincinnati, OH). The 3000 comes without any operating system (XENIX and MS-DOS are options that cost extra), but, if you buy both (MS-DOS for $99.95 and XENIX System V/286 for $595), they can co-reside on a single hard disk.

I live in a somewhat rural area, where power fluctuations and short power outages are fairly common. Thus, my Tandy 6000 often resets and will reboot only when given operator assistance for three specific actions: (1) an <enter> to reload the kernel; (2) a control-D to go into multiuser mode; and (3) a positive response to set the system date and time. The Tandy 3000 does not have this problem. The 3000 comes with a battery-operated user-resettable internal clock and a boot-track-controlled timeout to reload the kernel automatically and go into multiuser mode. This very desirable feature is included in many UNIX systems sold today. Of course, programs executing during the

FIGURE 3: Tandy 3000HD vs. 6000 `grep` Comparison

	MODEL 6000			MODEL 3000HD		
# SIMULTANEOUS RUNS	1	3	5	1	3	5
real	15.50	40.4	68.7	9.12	24.6	42.5
user	11.95	11.5	12.1	7.06	7.2	7.2
sys	2.79	21	2.6	1.59	0.9	0.9

FIGURE 4: Tandy 3000HD vs. 6000 `sieve` Comparison

	MODEL 6000		MODEL 3000HD	
	COMPILATION	EXECUTION	COMPILATION	EXECUTION
real	22.8	7.7	13.2	4.5
user	6.1	7.2	4.0	4.3
sys	7.6	0.3	4.0	0.1

crash may still create a problem with lost or corrupted data requiring the execution of `fsck`, and for that reason I still recommend a battery-power backup system.

Users can reconfigure the kernels of both machines with a configuration kit provided by Tandy. The kit comes with the XENIX System V/286 Development System for the 3000HD, but must be ordered as a "no charge" upgrade (catalog #700-3033) for XENIX/68000 on the 6000.

Tandy 6000 owners will also be jealous of 3000HD owners, who do not need to shut down their machines to format floppy diskettes. Unlike the 6000, which uses a Z80-based program to format floppies (which can be run only when XENIX/68000 is not running on the system), the 3000HD can format floppy disks while other XENIX System V/286 programs are executing.

I did find one significant limitation in this formatting program—I was not able to format diskettes in any format other than double-sided high density (1.2-Mbyte format). I did read 360-Kbyte formats without a problem (which is absolutely essential because many AT XENIX software packages are distributed in this format), but could not create the format. As a matter of preference, I would like to have the option of creating 360-Kbyte floppies on the 3000HD.

The Tandy 3000HD better addresses another problem that 6000 users have. As noted in Bruce Mackinlay's article, the Tandy 6000 has "very poor backup facilities." The 3000HD solves the problem with the optional Tandy TCS-100 Tape Cartridge System, which can hold 48 Mbyte of data or programs on a single cartridge. I have Radio Ranch's (Polo, IL) fine and very reliable X-Drive installed on my 6000, but the X-Drive is not as fast as, and has only one-half the capacity of, the TCS-100.

SOFTWARE AVAILABILITY

The following application software packages are available directly from Tandy: RealWorld (Chichester, NH) General Ledger, Payroll, Accounts Receivable, Accounts Payable, Order Entry, and Sales Analysis; Tandy's in-house developed SCRIPSIT word processing; and Profile, Tandy's version of the Small Computer Company's (New York, NY) database-management system.

In addition, I have tried several software packages developed for the official IBM PC/AT XENIX port and for XENIX from the Santa Cruz

Operation (Santa Cruz, CA), which seem to work flawlessly, true to the binary-code-compatibility promise of Microsoft Inc. (Bellevue, WA). As I mentioned in last month's "/XENIX" column, the most valuable package I've tried thus far is AT&T's Korn shell (`ksh`) from Aspen Technologies Inc. (Parsippany, NJ). If the binary-code compatibility between XENIX versions is 100 percent, then there is no reason why products such as SCO-Professional (1-2-3 work-a-like), Lyrix word processing, and Fox-BASE (dBase work-a-like), all from the Santa Cruz Operation, should not also work on the Tandy 3000HD.

Finally, if Tandy can quickly come to market with 3-COM's transparent MS-DOS and UNIX current and announced networking products for the XENIX operating system on the 3000HD, they will have a full range of hardware and software options for the IBM PC/AT-compatible marketplace.

CONCLUSION

If I wanted to buy a XENIX system from Tandy today, I'd have a tough choice. The lowest-initial-cost alternative is clearly the Tandy 6000. However, you get several more features and a lot more opportunities for expansion with the 3000HD. Certainly, neither decision is a bad one when you consider Tandy's "Clearly Superior" Service and Support. □

Rich Bilancia is the owner and founder of Computer Guidance & Support (Littleton, CO), a consulting firm that specializes in UNIX-based computerized accounting and database applications. He can be sent e-mail at:

`seismo!hao!{udenva!isis}`
`!bilanc!rab`
or
`ihnp4!onecom!nbires!isis`
`!bilanc!rab`

Please express your interest in this article by circling the appropriate number on the reader inquiry card.
High 707 Med. 708 Low 709