/xenix: 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. While 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 below. It is, however, a real workhorse.

If you haven't yet 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 a basic Model 3000HD.

Tandy 3000HD vs. 6000 Hardware Comparison
Figure 1.

Feature:	Model 6000			Model 3000HD		
	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	1Meg	1Meg	512K	12Meg	2.6Meg
Users	3	9	6	2	10	2
Floppy Disk	1-1.25Meg 8"	2-1.25Meg 8"	2-1.25Meg 8"	1-1.2Meg 5¼"	2-1.2Meg 5¼"	1-1.2Meg 5¼"
Hard Disk	1-15Meg	4-70Meg	1-70Meg/1-35Meg	1-20Meg	1-40Meg/3-70Meg	1-40Meg
Monitor	included	included	included	not included	$529.95	$529.95
Video adapter	included	included	included	not included	$399.95	$399.95
Hardware Price	$3,499	over $17,000	$10,371	$3,599	over $22,000	$6,748.55
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

First Impressions:
Having owned a Tandy XENIX® machine based upon the Motorola MC68000 MPU for as long as I have, I was really quite reluctant to even consider running XENIX® on a AT compatible. I must say, however, that I've been quite pleasantly surprised with the performance of the 3000HD and Tandy's port of XENIX® System V/286.

While 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 in comparison to the original Model 16 installation instructions which were quite limited, but even better than the current Model 6000 instructions (I also prefer the PC sized, 5¼" by 8½", manuals that come with XENIX® for the 3000HD rather than the full sized, 8½" by 11", manuals that come with the 6000). The 3000HD installation procedures allow the user

to configure his 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 that I discussed in last month's column) I ran my favorite quick benchmark:

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

While no benchmark test can ever tell all things, this simple test includes the time to load the 'grep' program, sequentially read a long file, do the regular expression comparison and then display the output on the console device. Ten iterations of the test on the 3000HD averaged:

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

while on the same ten iterations on my 6000 averaged:

```
real       15.50
user       11.95
sys         2.79
```

Needless to say I was impressed!

More speed comparisons:
I also ran the same test three and five times simultaneously to simulate a multiuser environment. The results were (Figure 2):

Tandy 3000HD vs. 6000 "grep" Comparison
Figure 2.

# simultaneous runs	Model 6000			Model 3000HD		
	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	2.1	2.6	1.59	0.9	0.9

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 followings confirming results (Figure 3):

Tandy 3000HD vs. 6000 "sieve" Comparison
Figure 3.

	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

Other differences:

Most noticeable is the physical size difference between the two machines. The Tandy 6000 with two external hard disk occupies about 4.25 cubic feet. The Tandy 3000HD, on the other hand, only occupies about 2.75 cubic feet, over half of which is the oversized 14" CM-1 color monitor. Also quickly apparent is the difference in the noise level 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 3000 HD 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 key strokes with 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, keyboard feel, a very individual preference, was nicer on the 3000HD than my Model 16A keyboard. (For the record I do prefer the 16A keyboard feel to the feel of the actual 6000 keyboard.)

The only complaint that I have with 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 accidently hit the backslash key in error, then try to correct the error by hitting the backspace key twice (once to erase the backslash an then once 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 TRSDOS, 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 TRSDOS 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 (Cincinatti, Ohio). The 3000 comes without any operating system (XENIX® and MS-DOS® are extra cost options), but if you buy both (MS-DOS® for $99.95 and XENIX® System V/286 for $595.00) they can co-reside on a single hard disk.

Living in a somewhat rural area, power fluctuations and short power outages are somewhat common. Accordingly, I often find that my Tandy 6000 has reset because of these power outages. When this occurs, my 6000 will only reboot with operator assistance required 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 automatically reload the kernel and go into multiuser mode. This is a very desirable feature included in many UNIX® systems sold today. Of course programs executing during the crash may still create a problem with lost data, 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 configuration 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 the fact that the 3000HD does not need to be shutdown to format floppy diskettes. Unlike the 6000 that uses a Z80 based program to format floppies (that can only be run when XENIX®/68000 is not running on the system) 3000HD users can format floppy disks while other XENIX® System V/286 programs are executing.

I did find one significant limitation with this formatting program--I was not able to format diskettes in any format other than double sided high density (1.2Meg format). I did read 360K formats without a problem (which is absolutely essential since a lot of AT XENIX® software is distributed in 360K format), but could not create the format. As a matter of preference, I would like to have the option to create

360K floppies on the 3000HD too.

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

Software availability:
The following application software packages are available directly from Tandy: RealWorld (Chichester, New Hampshire) 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, New York) database management system.

Additionally, 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, California) which seem to work flawlessly, true to the binary code compatibility promise of Microsoft, Inc. (Bellevue, Washington). As I mentioned in last month's "/xenix" column, to me the most valuable package I've tried thus far is AT&T's Korn shell ("ksh") from Aspen Technologies, Inc. (Parsipanny, New Jersey). If the binary code compatiblitity between XENIX® versions is 100%, then there is no reason why products like SCO-Professional(tm) (1-2-3® workalike), Lyrix(tm) word processing, and FoxBASE(tm) (dBase(tm) workalike), all from Santa Cruz Operation, Inc. (Santa Cruz, California), should not work also on the Tandy 3000HD.

Finally, if Tandy can get their MS-DOS® networking product, ViaNet, to the market place 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 were to buy a XENIX® 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(tm)" service and support.

Rich Bilancia is the owner and founder of Computer Guidance & Support, Littleton, Colorado, 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
```