



Equity III Competes As a Low-Priced Clone

By John Lombardi
Review Board

After a disastrous flirtation with innovation in the QX line, Epson America learned its lesson with the Equity series of IBM-compatible personal computers. Where some manufacturers compete by adding features and capabilities, Epson America simply makes a faithful clone in an elegant box and sells it at a lower price.

This formula has been successful with the Equity I, a fully IBM PC-compatible machine appealing to those people who want both lower prices and a brand name with a reputation for quality.

Likewise, the Equity III imitates the IBM PC AT at a lower price. But while the Equity III is fully compatible with the AT and performs well in most respects, Epson America was less than completely faithful in one aspect of its imitation. The 20-megabyte hard disk drive is simply too slow to be competitive in the fast-paced PC AT market.

FEATURES: The Equity III uses an 80286 microprocessor running at 6 MHz. The main board for both configurations has a full 640K of memory, and Epson America says the system can accommodate up to 15.5 megabytes with expansion cards. A socket is provided for an 80287 math coprocessor.

Our machine had one 1.2-megabyte Matsushita-built half-height floppy disk drive and a Seiko/Epson brand 20-megabyte hard disk. The Western Digital hard disk controller card can handle two drives, and the floppy disk controller, built into the main board, can handle another two drives. The 200-watt power supply is capable of supporting it all.

The main board includes serial and parallel ports (with IBM AT-style connectors), two 8-bit IBM PC XT-compatible expansion slots, and six 16-bit IBM AT-compatible expansion slots. On our machine, the hard-disk controller took up one 16-bit slot, and the IBM-compatible color-graphics adapter took an 8-bit slot. There is a battery-backed memory for configuration information and the clock calendar.

This machine comes with MS-DOS, Version 3.1 and GW-Basic, along with a separate diagnostic program for the hardware. Also included are Xtree, a hard-disk organizing utility, and Archive, a backup and restore utility. The keyboard is standard-issue IBM AT compatible (old style, with 10 function keys); it has a soft touch. Epson America sells both red-green-blue and monochrome monitors for the system, but unfortunately the company sent us a machine equipped with a color graphics board and the monochrome monitor, which has the wrong kind of plug. We used an Amdtek 300 composite green screen for our tests.

The hardware features list for the Epson III could apply to any number of IBM AT clones. This is a remarkably unremarkable clone.

PERFORMANCE: In tests of microprocessor speed, the Equity III, with its 6-

MHz 80286, is equivalent to the 6-MHz version of the IBM PC AT, which means the Equity is about five times faster than the IBM PC.

In broader tests of overall system speed, the Equity performed less well. We measured effectiveness with a set of small programs written in Basic and compiled Basic that read and write files, display material to the screen, and mix microprocessor and disk tasks in a simulation of real work people do with microcomputers.

In these real-world tests, the Equity III runs quite a bit slower than the IBM AT. Most of the difference can be traced to the very slow fixed disk used in the Epson America computer. Whereas the AT-class hard drives have an average access time in the range of 40 milliseconds or less, the Epson America drive clocks at about 90 milliseconds. This is slower than the IBM XT 10-megabyte drive, which is rated at 85 milliseconds, and slower than most third-party add-on 20-megabyte drives for the IBM PC, which tend to rate about 75 milliseconds or better.

The Coretest disk test utility from Core International measures overall drive performance in terms of the flow of information from the hard disk through the controller board to the computer. A stock IBM PC XT has a rating of 1, an IBM AT comes in about 2, or twice as fast. The Equity III clocks in at 1.6, about half way between an XT and an AT. Evidently, the speed and power of the 80286 microprocessor compensate somewhat for the slowness of the Equity III drive itself.

This is a slow IBM AT clone. We would not recommend it for users who have disk-intensive applications such as the management of large databases and who are expecting the dramatic performance increases attributed to AT-level machines.

AT performance is a result of both processor and drive. With its slow drive, the Equity III cannot be rated satisfactory because it does not meet the minimum requirements for an AT-compatible performance computer. We are therefore compelled to rate the Equity III as poor in performance.

DOCUMENTATION: Equity III's documentation is a cut above standard fare for a computer system. The GW-Basic manual is a good reference manual for programmers who are interested in the finer points of the Basic language and in using special features of the Equity III from Basic.

With the MS-DOS manual, Epson America has chosen to offer more than just a repackaged Microsoft manual. They've added good illustrations and screen shots, organized it well, put in a good index, and used a clear typeface. The special features of the Epson version of MS-DOS are explained at the appropriate places in the manual, rather than leaving everything generic. Xtree and Archive both have their sections, along with the other added commands and special utilities.

The system also comes with a diagnostics booklet that helps the user interpret and use the diagnostics disk for checking disk drives, display hardware, memory, and other devices. The diagnostics are exten-

Epson's Equity III features a 16-bit 80286 microprocessor and is bundled with Version 3.1 of MS-DOS.

sive and effective, and the manual provides sufficient information to make use of the routines.

Although short on technical details about the hardware (a technical hardware manual is available separately), the documentation deserves praise for providing well-organized information on the software, including the bonus utilities and their specific application to this computer. We rate the Equity III's documentation as very good, especially when compared to the documentation available with most cost-conscious AT clones.

EASE OF USE: The Equity III keyboard and display hardware are practically identical to those available for the IBM AT standard, although the keyboard is a bit lighter to the touch.

Text characters differ slightly from the stock IBM display in that they are somewhat squarer in appearance than the IBM standard display characters. We found them easier to read, but others we asked didn't much like them.

The Epson America version of MS-DOS has its variations. Included among them are utility programs for setting the various operating characteristics such as screen type and printer ports.

In addition, the operating system includes the Xtree utility, which helps users manage complex hard disk directories and simplifies a number of file management tasks related to copying, naming, and organizing numerous files in many subdirectories. Xtree is powerful, and the instructions provided are excellent. Xtree materially improves the machine's ease of use. Xtree is also available as a commercial product; the version supplied here, though, only works with the Equity computers and will not run on other IBM compatibles.

In place of the much-criticized MS-DOS utilities Backup and Restore, Epson America supplies a nifty Archive utility that offers a full-screen, menu-driven facility for making and restoring backups of your hard disk files.

The program is well-done, with good instructions and many options. However, the files created in this fashion are incompatible with the PC-DOS Backup and Restore utilities. Epson America should have retained these two utilities for the sake of compatibility, so that those who have backups prepared on other systems can restore them to the Epson America computer. We even know of one software vendor who provides a database on Backup form and installs the data on your hard drive using the restore command.

The Epson America version of MS-DOS 3.1 has some interesting additional utilities. DU is a menu system for formatting and copying disks. Setmode sets up the video display. Two other utilities provide assistance in setting up printers and serial ports. Each of these consists primarily of a little menu that simplifies a

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CopyWrite

BACKS UP
IBM PC
SOFTWARE

CopyWrite is the only backup program for IBM PC software. It backs up all files in a directory, including subdirectories, and saves them on a 5.25-inch floppy disk. CopyWrite is easy to use and requires no special hardware. It's available for \$19.95 from InfoWorld.

CopyWrite is a DOS-based program that will backup your IBM PC software. It's easy to use and requires no special hardware. It's available for \$19.95 from InfoWorld.

CopyWrite will backup copies of your software. It's easy to use and requires no special hardware. It's available for \$19.95 from InfoWorld.

To order CopyWrite, send a check for \$19.95 to InfoWorld, 2015 K Street, N.W., Washington, D.C. 20006. Or call (212) 655-1100.

The 20-megabyte hard disk drive is simply too slow to be competitive in the fast-paced PC AT market.

function, then calls the normal DOS function to accomplish the task itself. They all work well.

Because of the extra utility programs, especially the Xtree and Archive utilities, which make use of the operating system easier, we rate the Equity III's ease of use as very good.

SETUP: Epson America's Equity III takes no great skill or knowledge to set up. You take it out of the box, plug in the keyboard, attach the power cord, plug in the monitor, and plug the system into the wall. It doesn't take more than just a few minutes. We did run into a problem because we had been given the wrong monitor, and its plug didn't fit the machine's socket. It took us some time to figure out why the monitor wouldn't work.

We followed the manual's instructions for setting up and formatting the hard disk. The instructions turned out to be comprehensive and intelligible, and the process of partitioning and formatting the disk proved easy to accomplish. Epson America includes menu-driven utility programs to help

speed this task, and they worked well.

The diagnostics disk has a routine for initial setting of the date and time for the built-in clock calendar and for identifying memory size and disk types for storage in the battery backed-up random-access memory.

Given the good instructions, simple procedures, and helpful utilities, this machine earns a very good rating on its setup.

SERVICEABILITY: The Equity III comes apart easily, the layout inside is clean and uncluttered. Disk drives and other components can easily be removed, replaced, or added. Fasteners are standard Phillips head screws. Memory on the main board is soldered, however, with two banks of 256K chips and two banks of 64K chips. Replacing a bad memory chip would not be a task for an amateur.

Eight expansion slots are arranged in standard IBM PC AT style and can accept standard expansion cards.

The Equity III chassis can accept two full-height, 5¼-inch devices, or up to four half-height devices. Power connectors are available for four devices and the controller cables can accommodate two floppy drives and two hard disks. Most competitors can handle only three devices. The 200-watt power supply is ample for the needs of four devices. Other components are easily accessible.

Epson America provides a list of regional service centers covering the entire country and recommends that users take or send defective equipment to one of those centers should a local dealer be unable to solve a problem. We called a local center to ask questions. The response was quick and well-informed, especially considering that the machine is still new on the market. We asked about the slowness of the disk drive (they recommended we buy a faster third-party disk), availability of add-on memory boards (any IBM PC AT-compatible boards will work), and compatibility with third-party hardware (everything should work). Our impression was that telephone support is helpful and unusually well-informed.

The warranty is for one year, rather than 90 days, and Epson's warranty specifically guarantees that the machine will live up to its specifications. However, the cost of returning a defective machine to an Epson America service center is the responsibility of the user.

This well-built machine should provide reliable service and be reasonably easy to repair, since it uses standard IBM-compatible components, although soldered memory chips are less desirable than socketed chips. Very good construction, warranty, and telephone support earn the Epson Equity III computer a very good in serviceability.

VALUE: Although its hard disk is relatively slow compared to an IBM PC AT, the processing power and other characteristics of the Epson America Equity III are virtually identical. Balancing its slow performance against a relatively low price when compared to a PC AT, and the availability of some useful utility programs with the operating system, we rate the Equity III as a satisfactory value. It cannot be rated higher when the Tandy 3000 offers the same features plus a fully AT-compatible hard drive and a faster 8-MHz processor, all at a lower price ("Tandy 3000: Solid Line of AT Clones," May 26, 1986).

If speed of disk access is not critical, the lower price and extra utilities make this a satisfactory AT clone. If disk speed is important to you, follow Epson's advice and buy a third-party drive.

John Lombardi is a professor of history and author of five books. He has been working with computers since 1967.

Alps P-2000 Is Rugged But at \$995 Expensive

By Tony Lima
Review Board

Does the world really need another 9-pin dot-matrix printer? Especially one priced at \$995?

You wouldn't think so, but after spending a few weeks working with the Alps P-2000, we think you could do worse than take a good look at this one. The P-2000 is very fast, has a lot of features, and is quiet — so quiet that we were bewildered by the "quiet" printing mode; we doubt if even a library would need to use it.

FEATURES: The Alps P-2000 comes ready to fill most of the printing needs of the heavy-duty printer user. Its features include a built-in tractor feed, four modes of operation, a reverse-roll mechanism for overstriking in high-density modes, ports for two plug-in font cartridges, labeled configuration switches, a standard Epson FX-100-like ribbon, and a serial-parallel port arrangement that actually works.

Let's look at these features one at a time. Having a built-in tractor feed is a bonus. We have had trouble installing some optional tractor feeds, and some of them don't do a good job of hooking the paper accurately. The tractor feed is also easier to load than some pin feeds we've seen.

The adjustable tractor feed is 136 columns wide and is capable of handling full-width computer paper. It operates in both pull and push modes, which makes possible the precise reverse-roll feature used for such things as superscripts and subscripts.

The P-2000 also uses the reverse-roll feature to produce near letter-quality output. Each line is printed twice, with a slight extra carriage roll between overstrikes. This gives superior print quality from a mere nine pins.

The P-2000 offers both standard Epson FX-80 graphics and the IBM extended ASCII graphics set at the flip of a DIP (dual in-line package) configuration switch. In IBM mode, graphics characters are printed cleanly, except for the double-line character, which the P-2000 prints as a single line. The FX-80 mode gives you access to user-defined character sets.

The P-2000 includes a separate interface cartridge. One interface cartridge lets you use the printer with an IBM PC, XT, AT, or compatible, while the other links the printer with the Apple Macintosh, Apple III, and Apple II family. (Alps has not yet tested this interface cartridge with the Mac Plus.) You can specify which cartridge you want when you buy your printer; buying an extra one costs \$175.

The IBM cartridge we tested included both a serial and parallel port. Each port had its own connector. The parallel port uses a standard Centronics-type interface, while the serial port has a standard 25-pin D connector. This means it is impossible to damage your printer by accidentally connecting a serial port to a parallel port. You select the serial or parallel option by setting DIP switches in the interface cartridge. Ready/Busy, ETX/ACK, and KON/XOFF protocols are supported.

You can choose several other options from the front panel, including print pitch (10, 12, or 17) and spacing (normal or proportional). You can also set print options so they cannot be overridden in software.

PERFORMANCE: If you're going to spend nearly \$1,000 on a dot-matrix

Infoworld

REPORT CARD

PERFORMANCE COMPUTERS
EQUITY III

	4.0 	Unacceptable	Poor	Satisfactory	Very Good	Excellent
Performance	4.0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Documentation	4.0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of Use	4.0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Setup	4.0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serviceability	4.0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Value	4.0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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