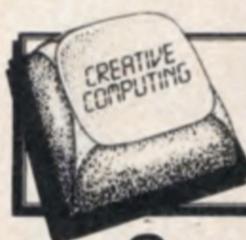


**An Apple work alike
at an attractive price.**

HAVAC

from Microsci



**HARDWARE
EVALUATION**

Owen Linzmayer

Let's start right off by setting things straight. Havac is a synonym for destruction. HAVAC is an acronym for Home/Academic Very Affordable Computer. This, my friends, is a review of the 64K Apple-compatible Havac computer from Microsci. Now that we have dealt with the formalities, on with the review.

History

The Havac is a new computer with an interesting background. Back in the days of yesteryear, when software publishers were thriving on entertainment program sales, a small hardware firm decided that there was a market for a game machine that would run only Apple entertainment packages.

Since it would only play games, all that was needed was a joystick port and a disk drive to load the programs, reasoned the hardware developers. Unfortunately, more and more new games were being introduced that required keyboard input to work correctly. By the time the need for the keyboard became evident, it dawned upon the designer that he essentially had

HARDWARE PROFILE

Product: Havac
Type: Desktop
CPU: 6502
RAM: 64K/64K
ROM: 8K
Type of Keyboard: 63-key detachable full-stroke
Text Resolution: 40 x 24
Graphics Resolution: 280 x 192
Number of Colors: 16
Sound Capability: Yes
Ports: Parallel, serial, disk drive, hand controller
Dimensions: 5.5" x 10.75" x 14.5"
Documentation: Fair
Summary: An alternative Apple worth investigating.



Microsci Engineering Manager Alan Silver, the proud designer of the Havac.

Manufacturer:
 Microsci Corp.
 2158 S. Hathaway St.
 Santa Ana, CA 92705
 (714) 241-5600

an Apple-compatible computer. Why not expand the machine a bit and sell it as a full-blown computer system. That, dear readers, is the story of the Microsci Havac.

Reality

The Havac of today is an unexpandable Apple-compatible computer based on the 6502 microprocessor. The main unit sports somewhat cumbersome 10.75" x 14.5" x 5.5" dimensions which encase a single-sided, single-density disk drive along with the computer motherboard. The heavily populated motherboard contains the 64K of RAM and 8K of ROM, as well as joystick, serial, and parallel interfaces. The detachable keyboard is a full-stroke 63-key model with the same layout as an Apple IIe. At \$799 retail, the Havac lives up to its billing as a "very affordable computer."

The detachable keyboard of the Havac has 63 full-stroke keys arranged in the same fashion as those on the Apple IIe keyboard. The cable to the main unit is hardwired to the keyboard and has a male 15-pin D-type connector on the other end that plugs into the lefthand side of the Havac. The keyboard unit itself is made of plastic and does not feel very solid.

However, I was pleasantly surprised to find that the response from the keys is excellent. I also like the fact that the caps lock key has a small red LED that lights up to signal when the key is active. In the upper lefthand corner of the keyboard is a Microsci emblem that acts as the power indicator for the computer. My only complaint about the keyboard is that the Tab, Delete, Shift, and Return keys are too small.

Built into the front of the Havac is the

of the screen are nine DOS commands, each with its own number. By typing a command number followed by a file number, you can perform operations with a minimum of keyboard input. This is excellent for beginning computer users, the main audience for the Havac.

Compatibility

For any Apple-compatible machine, the most important consideration is just how compatible it really is. After testing quite a few commercial software packages, I estimate that the Havac is about 80% compatible with available Apple II software. The Havac will not run software packages written specifically for the IIe, those that use CP/M, nor programs that need ProDOS and Applesoft Basic at the same time.

There are several different boot procedures that must be tried before you can determine whether or not a package will work on the Havac. These take into consideration different memory and language requirements, as well as if the program



The layout of the Havac keyboard is identical to that of the Apple IIe with the exception of a small LED on the Caps Lock Key.

The design philosophy of the Havac is similar to that of the new Apple IIc (see review elsewhere in this issue). Both computers are compatible with the Apple II line of software, neither has expansion slots, and both provide the user with printer and communications ports built-in at no extra cost. The Havac is intended to "meet the needs of the first-time computer user."

While the design philosophy may be the same for both computers, the physical designs are much different. Whereas the IIc is a sleek, low-profile computer, the Havac is a box-like system that resembles an old fashioned breadbox. Although the Havac will never be exhibited in the Museum of Modern Art, the substantial price difference between it and the IIc makes it an attractive alternative.

disk drive. The unit is a typical Apple-compatible single-sided, single-density drive that is accessed as if it were in slot six of an Apple. The \$199 optional external second drive is referenced as drive two, slot six. The disk drive closes with a small black lever. When a disk is inserted into the drive, the lever must be turned clockwise to 12 o'clock to engage the drive properly.

A disk containing the Havac disk operating system (DOS) is supplied with the computer. I like the format and features of this DOS, but it is not as useful as Apple's new ProDOS. A Havac DOS disk can hold a maximum of 104 files and display eight at a time in the main menu. Each of the eight files currently displayed by DOS is given a number. At the bottom

The Havac runs most (but not all) of the software for the Apple.

can utilize lowercase. If the program needs Basic, you must own a copy of Apple DOS with Applesoft and Integer Basic. The Havac material suggests buying this disk from your local Apple dealer to clear up most compatibility problems that you may encounter.

Interfaces

The Havac has several ports for interfacing a variety of peripherals. On the back of the main unit are the printer, communications, video, and second drive connectors. On the far left of the rear of the computer is the parallel printer interface. The printer port is a male 15-pin D-type connector. To interface a parallel printer, you must have the appropriate 15-pin to Centronics cable available from Microsci for \$40. You can also hook up a serial printer, but this is not as desirable since DIP switches on the bottom of the computer must be changed, and a special interface cable must be acquired.

To the right of the printer port is an RCA phono jack for video output to any standard NTSC composite monitor. If you want to use your television set as a display, you must get an optional RF modulator that plugs into the RCA phono jack.

Adjacent to the video output jack is the serial port. This female DB-25 connector is designed to be compatible with

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the RS-232C standard serial interface. Since almost all telecommunications is done in serial, this is where you connect a modem. Of course, many other serial devices are available for the Apple II line of computers, but few use the standard DB-25 connector. If you wish to try to interface these third-party devices, you will have to build your own custom cables.

All the way over on the righthand side of the rear of the Havac is a female DB-25 connector for the second disk drive. *Creative Computing* was supplied with an external disk drive for this review, yet the cable coming out of the drive was too short for the unit to be placed to the right of the computer, the recommended position. I expect that this minor problem will be corrected by the time the Havac goes into full production.

Toward the front of the computer on the righthand side is a 9-pin D-type game socket. This connector is identical to those on the IIe and IIc computers. Any device that plugs into the hand controller socket of the IIe should work with the Havac, but since the IIc controller port leads to special mouse firmware, it is doubtful that all IIc peripherals can be used with the Havac.

Support

The software and documentation included with the Havac are woefully inadequate. The word processor and communications package provided on the Havac DOS disk are bare bones programs with very few features. They serve well to introduce the first-time user to these applications, but must be replaced with more powerful packages if you ever wish to do any real work in those areas.

The same holds true for the documentation. The Havac manual is an introduction to the computer, not an in-depth look at how it works. For those interested in the advanced aspects of the Havac, a technical reference manual is available.

Ads for the Havac tout it as "the very personal computer." As far as ease of set-up and interfacing go, the Havac lives up to this claim. Even more important is the price. Several thousand dollars does not a personal computer make, regardless of what IBM might try to tell you. The basic Havac, priced at \$799 complete, is a very good buy if you are in the market for an Apple compatible computer.

Like the IIc, Havac lacks expansion slots for exciting peripherals such as digitizers, sound boards, and voice generators. The IIc has the advantage of carrying the Apple logo, which almost guarantees that third-party manufacturers will design dozens of IIc-specific devices. Hopefully adaptors and interfaces will be available so that Havac owners can use the new IIc devices.

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