

Franklin Ace 1000/1200

by Mike Heck

If you're about to bite into a delicious Apple, be advised: there's a nearly-identical 'fruit' out there that tastes just as sweet.

Only a year ago, very few people had heard of Franklin Computer (Pensauken, NJ), a small company manufacturing Apple II look-alike computers and peripherals. Today, that has changed. In fact, *Philadelphia Magazine* singled out Franklin as one of 19 companies to watch in 1983.

Why the growing acceptance of Franklin systems? (To date about 30,000 Ace 1000s have been delivered compared to 750,000 Apple IIs). First, though it may be hard to improve on an accepted and proven design, Franklin has enhanced some standard Apple features and added some of its own design. Second, Ace 1000 sells for several hundred dollars below a standard Apple II or IIE. And if you take into account standard Franklin features that cost extra on the Apple, the price difference is more than \$400 in favor of the Franklin.

Naturally, there are some trade-offs—in the areas of documentation and support, and in the few Apple features that were not implemented.

Basic hardware

The Franklin Ace 1000 is designed to be functionally identical to an Apple II. The Ace 1000 contains 64 KB of RAM (user memory) and uses any Apple-compatible peripherals (e.g., disk drives, printer cards, etc.). The Ace 1200 is an upgraded Ace 1000 that includes several add-on cards you would need to make an Apple or Ace 1000 operational in a professional environment (e.g., printer cards, disks, and memory expansion).

On the surface, both the Ace 100 and 1200 are similar, but the 1200 has a special top cover enclosing one or two built-in disk drives. Wider and longer than the Apple, both machines put the extra space to good use.

The first improvement is the addition

of a 12-key numeric keypad to the right of the normal keyboard. This keypad contains keys used extensively with programs like VisiCalc (from VisiCorp; San Jose, CA), such as the greater-than sign (>). In addition, the keyboard can be turned into an editing helper, complete with insert and delete functions, by typing: CTRL-Pause. The Ace 1200 also has the function names placed on the keys (e.g., next word, previous word, etc.).

But even without those mind-joggers, programs like WordStar are much more tolerable when using the keypad to move the cursor within text and to format documents. Programs that use standard ASCII codes for cursor movement (or similar operations) will be able to take advantage of the editing features without modification. My Apple version of WordStar worked with these editing keys without requiring a single program change. On the Apple II, WordStar requires the user to type either an Escape or a Control sequence to edit text. However, the keyboard on the latter does contain two added cursor control keys (vertical movement), a delete key, and two control keys.

To the left of the Franklin keyboard, you will find Control, Escape, Break, and Pause keys. The Pause is especially nice when you need to quickly halt program execution. The RESET key is conveniently recessed under the keyboard to avoid accidental bumping.

Franklin's keyboard has a good, positive feel that is easy on the fingers, even after hours of typing. All keys repeat if held down for more than a second. On the version I've been using, the keyboard circuit card has switches available for eight function keys across the top of the keyboard. These will probably be functional in the next release of the product. The only fault I could find with the keyboard



is the smooth surface of the keycaps, which causes fingers to slip occasionally.

One disappointment with the Apple II was a lack of lower case display. The only ways around this were either to add a 40-column lower case adapter or use an expensive 80-column card. The Franklin and Apple IIe both display upper and lower case in the normal 40-column mode. A nice feature of the Franklin is an illuminated indicator on the cap-lock key that shows when the keyboard is locked in the upper case mode. The computer also automatically shifts the keyboard to the upper case mode when the system is switched on.

Power is another critical area Franklin addresses. While the Apple switching power supply may be efficient, it is notorious for failing under the load of peripherals cards in all expansion slots. It also generates a lot of heat, as evidenced by the number of external fans available.

Franklin solved these problems by incorporating a 50w power supply with a built-in fan that can handle the heaviest load while keeping everything running cool. A heavy-duty switch on the power supply is used to switch the system on and off. The Apple's on/off switch is prone to break, and repair involves replacement of the entire power supply.

Internal components

Inside, both the Ace 1000 and 1200 are again similar to the original Apple II; but the Franklin main circuit board is about 1/4 larger. The board is well-constructed with a heavy epoxy base. The design is very clean and is without any last minute "fixes" that sometimes show up as external jumper wires or cut traces. All IC chips are socketed for easy replacement. This also makes attachment of external peripheral cards, some of which require connections to the main board, very simple.

The extra board size allowed Franklin to space the eight peripheral slots further apart, thus eliminating the crowding that is characteristic of a fully-loaded populated Apple. Unfortunately, the connectors of the Franklin allow some cards to move from side-to-side slightly; however, I never found this to interfere with the actual operation of any cards.

Compared to the Apple IIe with a low chip count (about 30), the Franklin still uses the older design that depends on more than 100 circuits (though functionally both systems operate the same). The Apple IIe and Franklin place all 64 KB of RAM memory on the main board; the Franklin uses 16 KB chips and the Apple IIe uses newer 64 KB circuits. An Apple

II requires a 16 KB memory expansion card in expansion slot 0 (zero) to create a 64 KB system.

Because the market for these 16 KB cards has been virtually eliminated in favor of new designs, many vendors started marketing larger memory cards. These larger cards were originally thought to be universally adaptable to all Apple products and could be placed in expansion slot #0. (Some also attach to the main circuit board.)

There is no compatibility problem with the Franklin, but the Apple IIe doesn't have a slot #0 or the standard circuits on the motherboard, therefore it's possible that the card will not work. Apple gets around this problem on the IIe with its Super 80-column card that offers not only the expanded display but 64 KB of additional RAM.

The Franklin provides a simple jumper on the main board that can be switched to disable the upper 16 KB bank of on-board memory. This allows you to use large capacity memory cards without conflict—up to 512 KB if desired!

The one obvious shortcoming of the original Franklin design was a lack of color display. All low- and high-resolution graphics capabilities are identical to the Apple, but without the color.

For those with a little ambition, there are several easy ways to add standard Apple-compatible color to the Franklin (16 low-resolution and eight high-resolution colors). The first option is to install a simple color adapter, something that can be done in a few minutes. These are available from several sources and typically require removing a chip, installing the piggy-back adapter in the empty socket, replacing the chip, and attaching two wires. Total cost is about \$50. I was impressed with the color display produced by this method and judged it equal to or better than that of the Apple.

Franklin is now offering a color option for both models that can either be ordered with the machine or installed by the user later on. It consists of a separate color circuit board that is placed inside the computer under the keyboard. This board is almost as wide as the keyboard and requires some external wiring to make it operational. It's best to order the option installed if you're squeamish about working inside the computer. This option, besides giving you compatibility with the standard colors mentioned before, provides you with 48 colors and 256 hues.

Although existing programs can't take advantage of this expanded range of colors, any programs that you design or any that are specifically written for the color Franklin will be able to use this new

palette. To get the optimum results with this board, it's best to use a good quality color monitor; you'll want to get the most from the brilliant colors available.

The only other deficiency of the Franklin hardware is a lack of cassette interface; but because of inexpensive disk drives, most people in a business environment don't use cassette recorders for storing data or programs. If cassette capability is a must for your application, the necessary circuitry exists on the mother board; for a few dollars in parts and a half-hour's time, it can be made functional.

The package deal

Up to now, we've covered features common to both the Ace 1000 and 1200. The Ace 1200 goes one step farther by including practical items that most people would need in configuring a functional system including: built-in disk drive and controller, 80-column card, serial/parallel interface, total memory of 128 KB, and a high-speed Z80 card for running CP/M programs. About the only thing that would need to be added is a monitor and printer. At \$2,495, the Ace 1200 saves you about \$800 over buying all those cards separately.

The disk is Apple DOS 3.2/3.3-compatible and holds 160,000 characters of information. A second drive can be added and attaches directly to the single disk controller card.

A Centronics-compatible printer interface and serial communications interface are implemented on another card. These follow accepted standards and should work with all existing software. The serial interface is programmable for a variety of baud rates and data protocols (e.g., data bits, parity). It can be used to drive either a printer or a modem.

The 64KB of extra RAM may be used, for example, as additional program memory or as a large print buffer. Features found on most 80-column display cards (e.g., inverse display) are also implemented on the Franklin design.

The high speed Z80 is the most exciting of all the cards. It operates at three times the speed (6 Mhz) of other Z80 cards for the Apple. The result is significant time savings when running most CP/M applications. Programs like WordStar, dBase II, and CP+ running with this card under CP/M version 2.20B did appear to execute much faster. I didn't have a chance to do a formal benchmark, but rough timings with WordStar indicated at least a two-fold increase in disk access and screen refresh time with the Franklin hardware versus the Microsoft (Bellevue,

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WA) Softcard. One potential problem with this card is possible incompatibility with some Microsoft CP/M programs. I was not able to isolate any specific examples, but it's best to try to verify compatibility before you invest in a specific program.

Operating environment

Both Franklin systems contain the equivalent of Applesoft Basic and monitor routines. This assures compability with existing Apple software. As part of the Apple IIe redesign, Apple added 4 KB to its operating system, part of which is a keyboard-activated self-test. These features are not included with the Franklin. The DOS (Disk Operating System) included with Franklin disk drives is also compatible with Apple DOS and includes several helpful utility routines for disk backup and similar functions.

I tried nearly all the popular programs

designed for the Apple—from spreadsheets to data bases to games—and found that all behaved normal. The only problem involved the lower case 40-column mode. Some programs like Apple Writer II, Executive Secretary, and The Last One require a lower case adapter and don't properly recognize the lower case characters from the Franklin display chip. The solution is to use lower-case adapter designed for, and sometimes supplied with, these programs.

There is more software available for the Apple than just about any micro, and this is certainly an incentive to design a machine to take advantage of that tremendous base. I've owned an Apple from almost day-one and respect the support Apple has provided. However, the company has been slow to enhance its six-year-old design; even the Apple IIe doesn't include some important features—a numeric keypad, good editing features, and better power supply with fan—that are standard with the Franklin. In

fact, the IIe has forced software designers to re-work many programs to make them compatible with the new machine.

But Franklin can't touch Apple in the areas of support and documentation. Your best bet is to stock up on Apple manuals and related material.

Franklin has taken the middle ground. While not incorporating some of the latest technology, such as 64 KB memory circuits, the Ace 1000 and 1200 remain compatible with all existing Apple software and hardware. Both systems offer good value and show forward-thinking in the enhancements provided.

What it really comes down to is this: There's always a risk in going against the leader—in this case, Apple. You may work a bit harder at first while figuring out all the nuances of the Franklin design (the editing features of the keypad are never explained in the documentation); but once over the small hurdles, the Franklin lives up to, and surpasses, expectations. □