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PROGRAMMING

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WHO NEEDS NETWORKS?

Do It Cheaper
With a BBS

CLONE REPORT:
ITT, Tandon, Kaypro

THE PCJR

Add-Ons for
The Afterlife

The Thrill
Of Soldering

PLUS

Programs, Columns,
Reviews, and More!

A CWC/I Publication
May 1987



May 1987

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For small companies, bulletin-board systems could be the first step toward faster and more efficient interoffice communication. Learn what it takes to set up a BBS, and then load our bulletin-board software for free..... 38

Cover photo by Edward Judice

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Bringing Up Junior

If you own a PCjr, you may be struggling with the question of whether to upgrade your system. The decision is easier if you keep in mind that with a second disk drive and extra memory, the PCjr runs a wider range of PC software than many IBM clones. In addition, prices of PCjr add-ons have been dropping steadily, and the variety of products is better than ever.

Adding to a PCjr is easy. I'll review a number of commercial add-on products that you can install in fewer than 10 minutes with only a screw driver. Installation instructions accompany all of the products. If necessary, most vendors are willing to give additional guidance over the phone.

Some hardware items I'll mention, such as second disk drives and modems, require a small modification to your operating system software. When this is necessary, the vendors supply the necessary software with the hardware product.

As you'll see, upgrading the PCjr is a good, economical way to put the equivalent of an IBM PC or PC/XT in your home or small business.

Expansion Sidecars

IBM introduced sidecars as the authorized means of expanding the PCjr. Sidecars are essentially boards encased in plastic boxes that snap onto the side of the PCjr chassis and to each other.

IBM manufactures three types of sidecars: one for installing a parallel port (letting you use a parallel printer); one for increasing memory (in 128K increments up to 640K); and one for expanding the computer's power supply. Supporting more than two sidecars in a row can strain the PCjr's power supply, making the last type of sidecar necessary.

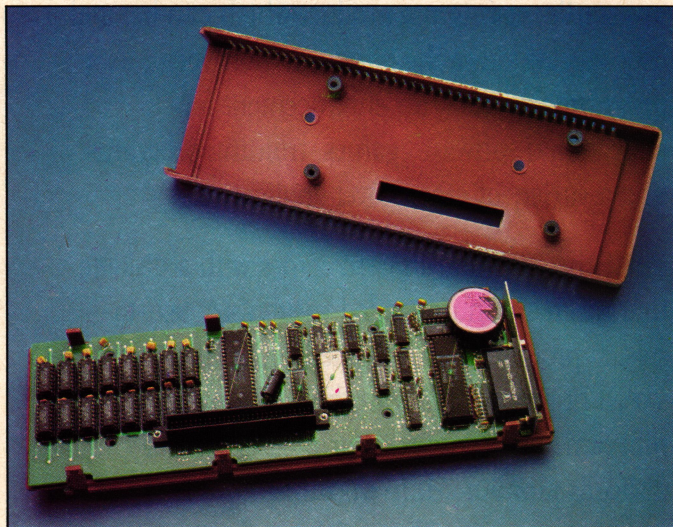
Currently, PC Enterprises is the only vendor still actively marketing sidecars for the PCjr. (See Photo 1.) Its sidecars come in memory increments of either 256K or 512K and do not require a power-attachment sidecar. It also offers the option of including a parallel port and a clock/calendar.

If you already own one of IBM's 128K memory sidecars, you can mail it to PC Enterprises, and the company will replace its 64K chips with 256K chips, increasing your sidecar's memory to 512K. Prices for this service range from \$109 to \$169, depending on the sidecar you own.

Photo 1. PC Enterprises' sidecars come in memory increments of 256K or 512K.

With one of the many PCjr
add-on products available, you can
raise IBM's orphan
to new performance heights.

by David Rottenberg



ES Quality Products makes a unique memory add-on product called The Hotshot. It is not a sidecar, but rather a memory/accelerator board that plugs into the PCjr's Intel Corp. 8088 microprocessor socket. The 8088 microprocessor then plugs into The Hotshot. Once installed, The Hotshot can dramatically increase processing speeds. For an extra \$13, the vendor installs a NEC V20 chip in the board, increasing processing speed by 20 percent.

The Hotshot comes with 256K or 512K of memory; a clock/calendar is optional. ES Quality Products offers a 60-day money-back guarantee and a two-year warranty.

Two Drives Are Better Than One

You can install a second disk drive—either internal or external—in the PCjr. Internal drives come in a chassis that looks like the PCjr chassis and fits directly on top of the existing drive. Internal disk drives usually provide expansion slots for memory boards and other add-ons. To install an internal disk drive, you remove the cover on the PCjr's chassis, make some simple connections, and snap the new chassis in place.

Racore Computer Products Inc., Legacy Technologies Ltd., and PC Enterprises all sell internal second disk drives for the PCjr, each with slightly different features. The Racore drive connects to the floppy-disk controller and comes with a parallel port, clock/calendar, and its own power supply. (See Photo 2.) The parallel port attaches to the side of the PCjr chassis, just like any sidecar. If you own a parallel port or memory sidecar, you can snap it onto the Racore parallel port to create two parallel ports or extra memory.

The Racore drive also comes with an internal memory-expansion slot. This slot accepts only Racore memory boards and—this is where things become tricky—Racore memory boards are not compatible with external memory sidecars. (See Photo 3.) In other words, if your PCjr already has a 128K memory sidecar and you want to increase to 512K, you cannot use a Racore memory board. You have to increase to 512K by buying additional sidecars or by selling the sidecar and starting over with Racore memory boards.

Starting over with Racore memory boards is not as bad as it sounds because, besides the memory boards, Racore has a product called Direct Memory Access (DMA). DMA, which works only with Racore memory boards, lets you enter data from the keyboard while the disk drives are turning. The IBM PC has this feature, but the PCjr does not. With DMA, you can work on large spreadsheets more quickly and efficiently. DMA also increases PC compatibility.

Racore has an established reputation as a supplier of PCjr accessories. Its disk drive comes with a one-year warranty, and the company provides good technical support.

Legacy Technologies' internal second disk drive connects to the PCjr's floppy-disk controller. Though it comes with its own power supply, it does not come with a parallel port or a clock/calendar. The chassis, however, has four expansion slots, and the company makes a parallel port, clock/calendar, and memory boards for the expansion slots. The

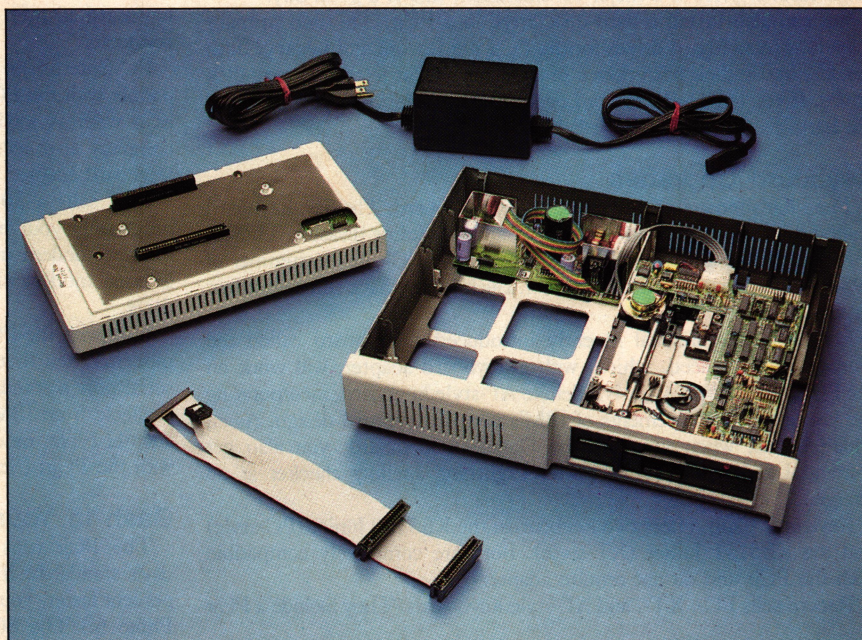
Legacy parallel port and clock/calendar, called The CPS, comes with software that lets you partition up to 64K of memory to use as a print spooler, enabling you to use your computer while the printer is working.

Legacy's disk drives come with a 90-day warranty, and the company also provides good technical support.

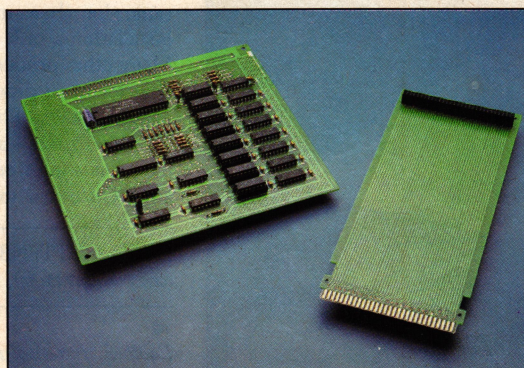
PC Enterprises sells what might be considered a stripped-down internal disk drive. It connects to the internal modem slot and is basically just a second disk drive in a chassis that fits on top of the PCjr. It does not have any expansion slots and uses the PCjr's existing power supply. If you already own many add-ons, power could be a problem. In this situation, I recommend consulting a technician either at PC Enterprises or at IBM before purchasing this drive.

PC Enterprises' drive is compatible with all manufacturers' sidecars and comes with a one-year warranty.

PCjr external disk drives come in small cases that connect to the computer through a cable in the back. External drives provide their own power supply. They can rest directly on top of the chassis or stand vertically to the side. Though they make for a less attractive appearance than internal drives and lack expansion slots, they offer one important



▲ Photo 2. The Racore drive connects to the floppy-disk controller.



◀ Photo 3. Racore memory boards are not compatible with external sidecars.



Photo 4. Datadesk's Turbo-101 Enhanced AT-style keyboard comes with a free copy of Borland International's Turbo Lightning spelling checker.

advantage: they're cheaper.

PC Enterprises makes a variety of external drives, each of which connects to the internal modem slot. The basic difference between the models is the size and sturdiness of the case.

True Data Corp. makes an inexpensive but reliable external disk drive that plugs into the modem slot and is vertically mounted in a beige case. If price is a major consideration, this is a good buy.

You can also install a hard-disk drive in a PCjr. The two primary manufacturers of hard drives for the PCjr are Racore and Legacy. Both vendors house their hard drives in a chassis similar to their floppy-disk drives. If you have a Racore or Legacy floppy-disk drive, you can stack the hard disk on top as a third drive.

Keyboard Upgrades

The PCjr's most glaring weakness is its keyboard. The first keyboard (called the Chiclet) was an engineering and marketing disaster. Though IBM introduced an enhanced keyboard for the PCjr in the summer of 1984, it doesn't win any awards, either. Luckily, you have some excellent alternatives.

Datadesk International recently introduced a keyboard called the Turbo-101 Enhanced, which, with a keyboard adapter, will work on the PCjr. (See Photo 4.) It is a deluxe AT-style keyboard, incorporating the layout and enhancements of IBM's newest keyboard design. As an added bonus, when you buy the Datadesk keyboard, you also get Borland International Inc.'s Turbo Lightning spelling checker at no charge.

Keytronic Corp. offers two keyboards: the KB5150 Junior (PC-style) and the KB5151 Junior (XT-style). Both are completely compatible with the PCjr and do not require adapters.

Racore sells PC-, XT-, and AT-style keyboards. They include a PCjr



keyboard adapter, which plugs into the PCjr's keyboard and light-pen connector.

PC Enterprises sells an XT-style keyboard that is completely compatible with the PCjr and, like the PCjr regular keyboard, can be used as a wireless keyboard or with the IBM PCjr keyboard cord. The company also sells PC-, AT- and XT-style keyboards that require a keyboard adapter similar to Racore's.

IBM sells a 300-baud internal modem for the PCjr, but it is not necessarily your best buy. For one thing, 300 baud is slow, and the internal modem uses a lot of power. The product also occupies the internal modem slot, which might be better used by a second disk drive.

However, the PCjr has a built-in serial port, so you can use external modems. You first must buy a serial adapter cable to make the PCjr serial port a standard RS-232 connection. This serial adapter cable is available from IBM, PC Enterprises, and Legacy. Once you install an adapter cable, modems from a wide variety of manufacturers will work with the PCjr. (See Photo 5.)

Cash In Your Chips

The PCjr runs on an 8088 microprocessor, a slow chip by today's standards. If you would like your PCjr to run approximately 20-percent faster, you can replace that chip with the NEC V20 chip. (See Photo 6.) The 8088 microprocessor is located underneath the PCjr disk drive and is easily removed. The NEC V20 chip plugs into the same slot. (In a small number of PCjrs, the 8088 is soldered in, making installation a task that should be performed by a qualified technician.) Many other products are available for the PCjr, including an Intel 8087 chip for math processing, a mouse, joysticks, books, dust covers, and adapter cables. The three largest PCjr suppliers—Racore, Legacy, and PC Enterprises—also promise more products in the future. Each company has a toll-free number and will send a free catalog. I would advise any PCjr owner to give them a call. □

DAVID ROTTENBERG is a novelist and freelance magazine writer. Address correspondence to Apt. 5B, 2130 Massachusetts Ave., Cambridge, MA 02140.

Photo 5. External modems, like this 300/1,200-baud model from PC Enterprises, require a serial adapter cable.

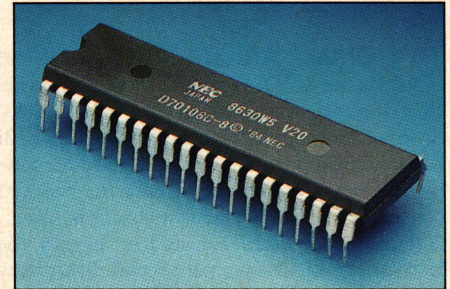


Photo 6. The NEC V20 chip increases processing speeds by 20 percent.

PRODUCT INDEX

Disk Drives

Legacy Technologies Ltd.

4817 N. 56th St.
Lincoln, NE 68504
800-228-7257
Floppy drive (internal): \$349.
Hard drive: with 20MB, \$1,095.

PC Enterprises

P.O. Box 292
Belmar, NJ 07119
800-922-7257
Floppy drive (internal): \$245.
Deluxe floppy drive (external): \$295.
Standard floppy drive (external): \$229.

Racore Computer Products Inc.

170 Knowles Drive
Los Gatos, CA 95030
800-325-1833
Floppy drive (internal): with parallel-printer port and clock/calendar, \$299; with DMA, \$349.
Hard drive: with 10MB, \$795; with 20MB, \$895.

True Data Corp.

P.O. Box 347
Uxbridge, MA 01569
800-635-0300
Floppy drive (external): \$199.95.

Expansion Boards

ES Quality Products

5311 Mango Blossom
San Jose, CA 95123
408-224-5574
The Hotshot memory board: with 256K, \$149; with 256K and clock/calendar, \$188; with 512K, \$189; with 512K and clock/calendar, \$228.

Legacy Technologies Ltd.

4817 N. 56th St.
Lincoln, NE 68504
800-228-7257
CPS parallel-port and clock/calendar card: \$99.
Memory boards: with 128K, \$119; with 256K, \$159.

Racore Computer Products Inc.

170 Knowles Drive
Los Gatos, CA 95030
800-325-1833
Memory board: with 256K, \$119; with 512K, \$149.

Keyboards

Datadesk International

7650 Haskell Ave.
Van Nuys, CA 91406
800-826-5398
Turbo-101 Enhanced: including keyboard adapter and Borland International's Turbo Lightning, \$169.

Keytronic Corp.

P.O. Box 14687
Spokane, WA 99216
800-262-6006
PC-style keyboard: \$219.
XT-style keyboard: \$255.

PC Enterprises

P.O. Box 292
Belmar, NJ 07119
800-922-7257
XT-style wireless keyboard: \$99.
PC-style (with adapter): \$94.
XT-style (with adapter): \$114.
AT-style (with adapter): \$104.
Enhanced AT-style (with adapter): \$124.

Racore Computer Products Inc.

170 Knowles Drive
Los Gatos, CA 95030
800-325-1833
PC-style (with adapter): \$99.
XT-style (with adapter): \$139.
AT-style (with adapter): \$119.

Miscellaneous

IBM Corp.

P.O. Box 2009
Racine, WI 53404
800-426-7282
Serial adapter cable: \$10.

Legacy Technologies Ltd.

4817 N. 56th St.
Lincoln, NE 68504
800-228-7257
Serial adapter cable: \$15.

NEC Electronics Inc.

P.O. Box 7241
Mountain View, CA 94039
415-965-6000
V20 chip: \$15-\$20, depending on distributor.

PC Enterprises

P.O. Box 292
Belmar, NJ 07119
800-922-7257
Serial adapter cable: \$19.95.

Modems

Legacy Technologies Ltd.

4817 N. 56th St.
Lincoln, NE 68504
800-228-7257
300/1,200 baud (Hayes-compatible): including adapter cable, \$220.

Magnetic Media of New England Inc.

234 Cabot St.
Beverly, MA 01915
800-992-0123
300/1,200 baud (Hayes-compatible): \$125.

PC Enterprises

P.O. Box 292
Belmar, NJ 07119
800-922-7257
300/1,200 baud (Hayes-compatible): including adapter cable, \$169.95.

Sidecars

IBM Corp.

P.O. Box 2009
Racine, WI 53404
800-426-7282
Parallel-port sidecar: \$50.
Memory sidecar: with 128K, \$125.
Power attachment: \$65.

PC Enterprises

P.O. Box 292
Belmar, NJ 07119
800-922-7257
Memory sidecar: with 256K, \$220; with 256K, clock/calendar, and parallel port, \$270; with 512K, \$245; with 512K, clock/calendar, and parallel port, \$295.