

Rainbow Clock Boards

These New RDS 087CLK-01 and
768CLK-01 Multifunction Modules
Give Rainbow Users a Personal
Time/Date Stamp

By Robert B. Trelease, Ph.D

It's an old routine by now. Every time you boot up MS-DOS on your DEC Rainbow, you enter the date and time. On rare occasions, when you are in a hurry or aren't worried about date/time-stamping one of your files, you may skip data entry with a couple of RETURNS. Of course, you know the penalty for using the default date and time: You lose track of when files were created and modified.

For many PC users, entering the date and time has become a necessary habit, but one that easily becomes tedious. If you have been watching the microcomputer market as a whole, though, you may have noticed that hardware developers have

been at work remedying these slow-downs by designing real-time digital clocks for personal systems. More recently developed machines, like the Macintosh, come with internal, battery-backed clocks as standard equipment. For users of other "three-letter PCs" and clones, several manufacturers are producing clock option boards, some of which also include memory expansion. Until recently, DEC Rainbow users have had to go without.

Now, however, Rainbow Data Systems (RDS) is producing two different battery-backed real-time clock expansion boards for the DEC PC-100 series. This article reviews the RDS 087CLK-01 and RDS 768CLK-01

multifunction modules and describes their use in upgrading Rainbow system functions.

THE RDS 087CLK-01 8087/CLOCK/RAM ADAPTER BOARD

Rainbow hardware developers have employed a few clever tricks for getting around the designed-in limits of the PC-100 series' three expansion slots. For example, the DEC PC-1XX-EA 8087 Adapter Board fits into the RAM expansion connectors and, with a piggy-back connector, accepts a RAM expansion board (See "The 8087" in *THE DEC* PROFESSIONAL — PLUS PERSONAL*, December 1985). Such a multifunc-

tion-card approach allows each expansion connector set to be used for more than one purpose.

The Rainbow Data Systems RDS 087CLK-01 Board also fits into the RAM expansion slot and provides a piggy-back connector for memory boards. But it surpasses the DEC PC-1XX-EA by providing, in addition to 8087 function, the desired battery-backed real-time clock. Like the DEC 8087 original, the RDS Clock Board

For testing 8087 and RAM function, the RDS 087CLK-01 is compatible with the PC-1XX-EA and its diagnostics. As an alternative, RDS has developed its own diagnostic and utility programs, which should be available by the time this review reaches press.

Installation is easy, like that for the PC-1XX-EA. The Rainbow motherboard is removed after "lifting the lid" of the system enclosure and

jumper plug is aligned and inserted into the CPU socket. The other expansion boards then are reinserted, connections are checked, and the motherboard assembly is reinstalled.

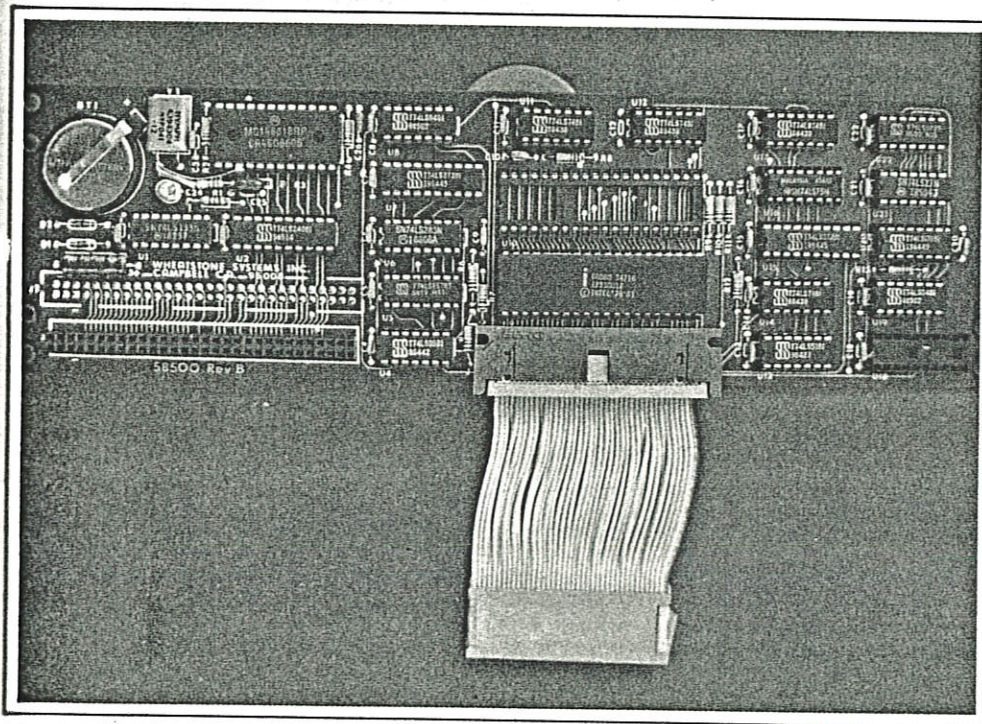
Clock board installation is completed by creating an AUTOEXEC file to read date and time when the Rainbow is bootstrapped. Hereafter, whenever MS-DOS is started, the system prompt (e.g., A>) appears without the usual prior request for date and time.

The RDS 087CLK-01 also can operate without the 8087 installed, as a simple clock/memory adaptor board. However, for Rainbow users who do not need the 8087 capabilities, another board is available.

THE RDS 768CLK-01 CLOCK/RAM EXPANSION BOARD

Like its companion, the RDS 768CLK-01 board provides a battery-backed real-time clock for the Rainbow. Instead of an 8087 and a piggy-back connector, the 768CLK-01 provides 768 Kb of on-board random access memory. This configuration is ideal for obtaining maximum RAM capacity in PC-100 systems that have not made use of the memory expansion "slot." The RDS 768CLK-01 board also uses the Motorola MC146818 CMOS microcomputer clock chip with a lithium cell for about two years of continuous time-keeping.

Documentation provided includes installation and user's guides. Installation of the RDS 768CLK-01 is similar to that described above for the other 8087 boards. However, since there is no piggyback connector, only the RDS board can make use of the RAM expansion "slot." Multi-segment memory diagnostics are used to test the new, full-capacity RAM function (832 Kb for the PC-100A and 896 Kb for the PC-100B/+). As with the other RDS Clock Board, installation is com-



The Rainbow Data Systems RDS 087CLK-01 Board.

allows RAM to be expanded to 832 Kb in the PC-100A and to 896 Kb in the PC-100B/+.

The RDS 087CLK-01 uses the Motorola MC146818 CMOS microcomputer clock chip with a BR2325 lithium cell to provide about two years of continuous time-keeping before "battery" replacement. The clock chip includes 50 bytes of on-board RAM with programmable alarm, true calendar, 12/24 hour, binary/BCD, auto leap-year and daylight-saving time functions. Documentation provided with the board includes comprehensive "Read Me First" installation and user's guides.

disconnecting power supply and disk drive cables. Any installed RAM board is removed from the memory expansion connectors on the motherboard. In order to expose the CPU, any DEC Hard Disk Controller or Extended Communication Option board comes out as well. The 8088 then is removed from its socket with the aid of a chip removal tool. If memory is to be reinstalled, the appropriate RAM board is mated to the RDS 087CLK-01 "piggy-back" connector, and four standoffs snap in to bind the boards together. The RDS board then is aligned and pushed down on the motherboard RAM connector and expansion board standoffs. The 40-pin

Hardware

pleted by creating an AUTOEXEC file to read the date and time at start-up.

FINAL NOTES

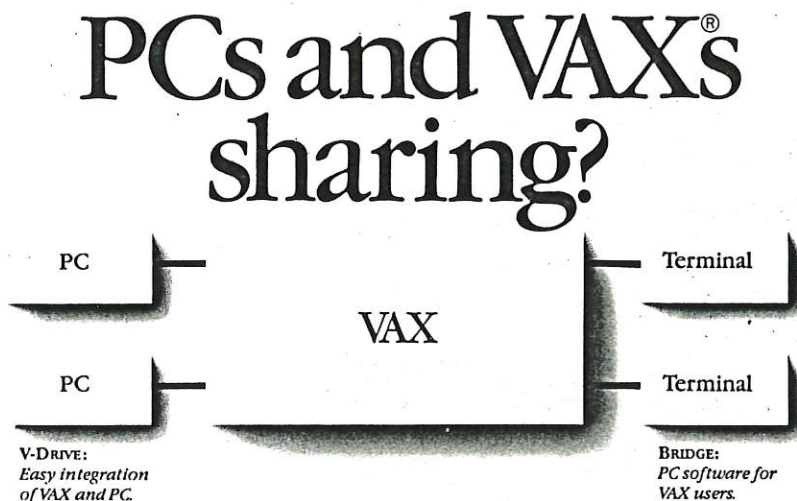
The RDS 087CLK-01 can be purchased with or without the 8087

chip. In order to save buyers money, the board itself is priced separately with the cost of the 8087 chip depending on current (falling) industry pricing.

The RDS clock boards free you

from the trivial task of entering the current date and time every time the Rainbow is bootstrapped with MS-DOS. On-board lithium battery power assures that the clock retains the time/date settings when the Rainbow AC power is turned off. Advanced clock and alarm functions are accessible for use by skilled programmers. In addition, the clock boards provide other functions so that the RAM expansion "slot" is employed for more than one task. With the RDS 087CLK-01, you can take advantage of the 8087 for accelerating floating-point calculations using versions of *dBASE III*, *LOTUS 1-2-3*, *AUTOCAD*, *C*, *FORTH*, and other properly equipped software packages. For certain applications, calculation speed may be increased 10 to 20 times. Memory also can be expanded to system limits using the RDS 768CLK-01 alone or using the RDS-087CLK-01 with a fully populated DEC RAM expansion board.

The Rainbow Data Systems clock boards provide DEC Rainbow users with some of the most sought-after expansion functions while maintaining compatibility with other standard hardware. The quality of these boards is comparable with that of other DEC Rainbow options. While it has taken some time for non-DEC hardware developers to come to market, Rainbow Data Systems has shown it was worth waiting for good peripherals. Given the quality and the thought apparent in these clock board designs, we eagerly may await additional versatile hardware options from RDS in the future.



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Price: RDS 087CLK-01 —
\$250 without 8087
RDS 768CLK-01 —
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