

DEC PDP-11 Family

Product Enhancement

Digital Equipment Corporation has recently added products for both the high and low ends of its PDP-11 minicomputer product line. At the high end, the company has made the PDP-11/84 available to end users by introducing an enhanced version of that top-of-the-line 16-bit system. The new PDP-11/84 reportedly delivers performance 20 to 40 times that provided by the original model, announced in December 1984 and available until now only to OEMs. According to DEC, the new system also delivers twice the power of the PDP-11/44, the previous high-end member of the family. At the low end, DEC has introduced two protocol emulators that provide links between the Micro/R SX operating system, which runs on the MicroPDP-11 computers, and IBM systems.

PDP-11/84

The PDP-11/84 CPU employs an 18MHz implementation of Digital's J-11 chipset (debuted on the MicroPDP-11/73), and represents the first use of that chipset in a Unibus product. The J-11 incorporates the full PDP-11/70 instruction set, including floating-point instructions and the extended instruction set found on other high-end PDP-11s. In addition to the J-11 chipset, the PDP-11/84 CPU module comprises a hot floating-point accelerator, a 22-bit memory management facility, an 8KB direct-mapped cache, a programmable line frequency clock, a 32KB bootstrap and diagnostic ROM facility, a switch-selectable console serial line unit, and 2KB electrically erasable programmable ROMs (EEPROMs). The memory management facility features a dual register set, separate instruction and data address spaces, and three system modes: kernel, supervisor, and user.

Other principal components of the PDP-11/84 system include a memory module and a Unibus Adapter module. The CPU, memory, and Unibus Adapter modules communicate with one another and with Unibus peripherals over the Private Memory Interconnect (PMI), which employs a protocol allowing high-speed data transfers, including doubleword reads. The memory module contains 1MB or 2MB of 256K error correcting DRAM; memory can be expanded to 4MB in 1MB or 2MB increments. The Unibus Adapter module interfaces to the PMI bus and the Unibus, coordinating all address and data communications among the CPU, memory, and peripherals. The Unibus Adapter module features a 32-word DMA cache designed to free the CPU from DMA transfer activities.

According to DEC, the PDP-11/84 is fully hardware-compatible with all other Unibus-based PDP-11s. Maximum disk capacity is 3.6GB. Among disk devices supported are the 121MB RA80 and 456MB RA81 fixed disk drives, the 52MB RC25 fixed/removable drive, the 205MB RA60 removable drive, the top-loading 10.4MB RL02 cartridge drive, and the 800KB RX50 dual diskette drive. The new computer also supports the 125-ips TU77 and the 25/100-ips TU80 and TSU05 magnetic tape subsystems. The PDP-11/84 is also software-compatible with the full PDP-11 line. The number of workstations that can be configured depends upon the operating system and the application for which the computer is used; DEC officials have stated, however, that the PDP-11/84 supports between 24 and 48 concurrently active users.

The PDP-11/84 is available either in a boxed, rackmount CPU package or in cabinet-mounted system kernel configurations; both types of packages are based on a standard 12-slot backplane that provides 8 expansion slots, along with power for added system options. The rackmount version of the system is housed in an enclosure 10.5 inches high, 19 inches wide, and 27 inches deep. It is designed for users who want to configure systems in standard industrial 19-inch RETMA racks or custom enclosures. The system kernel configurations are housed in a 42-inch-high floorstanding cabinet that incorporates the same functional elements as the rackmount package, but also includes additional backplane mounting space and an additional power supply for system expansion. The cabinet features an open card cage that offers 12 to 21 slots, with a maximum of 17 slots for added system options. It also includes space for a 10.5-inch rackmount option, such as a disk or tape subsystem.

A rackmount PDP-11/84 package with 1MB of main memory and system box is priced at \$18,000; a similar configuration with 2MB of memory costs \$20,500. The system kernel configuration with 1MB of memory is priced at \$22,500; the price of a 2MB version is \$25,000.

Several System Building Block configurations of the PDP-11/84 are available. The basic configuration includes 2MB of main memory, a system cabinet, a 16-line asynchronous DHU11 multiplexer, and an operating system general license; the price is \$31,500. An SBB containing the aforementioned components and dual RC25 52MB fixed/removable disk drives is priced at \$52,500. An SBB that substitutes a TU80 tape drive and a 456MB RA81 fixed disk drive for the dual RC25s is priced at \$67,000.

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DEC is also making available two kits to upgrade the initial (OEM) version of the PDP-11/84. The kits comprise two replacement circuit boards—a CPU board and 1MB or 2MB of memory. The upgrade kits are priced from \$4,500. DEC officials claim that the PDP-11/24 and PDP-11/44 can be field upgraded to the PDP-11/84 through a box swap and the transfer of certain components from the old to the new system.

According to DEC, the PDP-11/84 is currently available for shipment.

The introduction of the PDP-11/84 is yet another indication that Digital has abandoned neither the PDP-11 family—a longtime competitor in the minicomputer market—nor the family's extensive user base. However, the company has shifted its development and marketing efforts to the Q-Bus-based MicroPDP-11 grouping within the product line, so whether more powerful Unibus PDP-11s are forthcoming is open to question. Still, the 11/84 demonstrates DEC's willingness to employ newer technologies, like the J-11 chipset, to provide a more extensive migration path for Unibus PDP-11 users. Competition for the PDP-11/84 will be furnished by traditional rivals among 8- and 16-bit general-purpose minicomputers, such as IBM's System/38 and Hewlett-Packard's HP 3000 series.

DEC has also reduced the price of the VT220 terminal, which is compatible with both PDP-11 and VAX systems. The price of the VT220 monitor is now \$880 (down from \$1,180); a VT220 with both monitor and country kit/keyboard costs \$1,095.

Micro/RSX Software

The 2780/3780 and 3271 protocol emulators are layered software products that allow MicroPDP-11 systems running under Micro/RSX to communicate in batch mode or interactively with IBM systems using bisync protocols.

The 2780/3780 protocol emulator allows Micro/RSX-based MicroPDP-11 systems to emulate IBM 2780 and 3780 batch terminals and to transfer data to and from IBM systems supporting the IBM 2780 or 3780 protocol. The 3271 emulator, with a 3270 terminal emulator utility, allows users of DEC VT100- and VT200-series terminals on Micro/RSX systems to access an IBM host system. Both products are currently available. The 2780/3780 package is priced at \$1,200 and the 3271 package costs \$900. □