

DEC VAX-11 Systems

MANAGEMENT SUMMARY

UPDATE: For years, Digital Equipment Corporation's flagship VAX-11 systems have been recognized both implicitly and explicitly as the standard against which other superminicomputers are judged. After eight-and-a-half years on the market, however, those machines seem to have reached the end of the line; they have been supplanted by their direct architectural descendants, the more powerful and expandable VAX 8000 systems, which debuted in October 1984 and have been augmented by six models since January 1986.

However, even though the erstwhile flagship is listing heavily to starboard, Digital has not yet finished scuttling it. The low-end VAX-11/725 and 11/730 and the dual-processor VAX-11/782 have been scrapped, but the company continues to market the VAX-11/750, 11/780, and 11/785—the three most popular models in the series. Just how great the demand for those older machines will be remains open to question; however, Digital generally is able to continue deriving a good deal of sales mileage from seemingly outmoded but not officially retired systems—witness the company's PDP-11 minicomputer.

The three VAX-11s are general-purpose systems, useful for tasks ranging from commercial data processing through office automation to computation-intensive engineering and scientific applications. ▶

Digital Equipment Corporation continues to market its VAX-11/750, 11/780, and 11/785 systems, even though they have been supplanted by comparable VAX 8000 models. The VAX-11 systems retain software and peripheral compatibility with the newer VAX 8000 line, as well as with the now-outmoded VAX-11/725, 11/730, and 11/782.

MODELS: VAX-11/750, VAX-11/780, and VAX-11/785.

MAIN MEMORY: 2MB to 64MB.

DISK CAPACITY: 205MB to 218.8GB.

WORKSTATIONS: Up to 384.

PRICE: \$54,000 to \$509,000 (base configuration prices).

CHARACTERISTICS

The VAX-11 systems share many architectural and functional characteristics with Digital Equipment's newer VAX 8000 systems. Where the information on a specific topic is the same for both groups of systems, the reader will be referred to the "DEC VAX 8000 Systems" report in this volume of DATAPRO REPORTS ON MINICOMPUTERS. ▶



The VAX-11/785 is the high-end system in Digital Equipment Corporation's VAX-11 Systems family. The VAX-11/785 supports over 300 terminals, and, like other VAX-11 and VAX 8000 systems, can be configured in multiprocessor VAXclusters for enhanced storage and computational power.

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CHART A. SYSTEM COMPARISON

MODEL	VAX-11/750	VAX-11/780	VAX-11/785
SYSTEM CHARACTERISTICS			
Date of introduction	October 1980	October 1977	April 1984
Date of first delivery	November 1980	January 1978	June 1984
Operating system	VAX/VMS, Ultrix-32	VAX/VMS, Ultrix-32	VAX/VMS, Ultrix-32
Upgradable from	Not applicable	Not applicable	VAX-11/780
Upgradable to	Not applicable	VAX-11/785	Not applicable
MIPS	0.72	1.06	1.5 (approx.)
Relative performance (based on a rating of the 11/780 at 1.0)	0.65	1.0	1.5-1.7
MEMORY			
Minimum capacity, bytes	2M	2M	8M
Maximum capacity, bytes	8M	64M	64M
Type	64K ECC MOS RAM	64K or 256K ECC MOS RAM	64K or 256K ECC MOS RAM
Cache memory	4KB	8KB	32KB
Cycle time, nanoseconds	400 (cache-enabled)	290 (cache-enabled)	166 (cache-enabled)
Bytes fetched per cycle	8	8	8
INPUT/OUTPUT CONTROL			
Number of channels	1-5	1-8	1-8
High-speed buses	Massbus (3 optional)	Massbus (4 optional)	Massbus (4 optional)
Low-speed buses	Unibus (1 std., 1 opt.)	Unibus (1 std., 3 opt.)	Unibus (1 std., 3 opt.)
MINIMUM DISK STORAGE			
MAXIMUM DISK STORAGE			
	19GB local; 218.8GB in VAXcluster	30GB local; 218.8GB in VAXcluster	30GB local; 218.8GB in VAXcluster
NUMBER OF WORKSTATIONS			
COMMUNICATIONS PROTOCOLS			
	128	384	384
	Bisync, DNA, Ethernet, SNA, 2780/3780, 3271, X.25, X.400, LU6.2, TCP/IP	Bisync, DNA, Ethernet, SNA, 2780/3780, 3271, X.25, X.400, LU6.2, TCP/IP	Bisync, DNA, Ethernet, SNA, 2780/3780, 3271, X.25, X.400, LU6.2, TCP/IP

Note: A dash (—) in a column indicates that the information is unavailable from the vendor.

► The midsize VAX-11/750 implements custom bipolar LSI Schottky logic. It features a 4KB cache memory and can support from 2MB to 8MB of main memory. The VAX-11/750 can also accommodate up to 128 workstations and 205MB to 19GB of local disk storage. One Unibus adapter (integral to the processor) and up to three Massbus adapters or one additional Unibus and two Massbus adapters may be used for connection to mass storage devices and other peripherals.

The VAX-11/780, Digital's initial VAX-11 product offering, features an 8KB cache memory and can support between 2MB and 64MB of local main memory. (It can also support an additional 4MB of shared memory, as can the VAX-11/785.) The VAX-11/780 can accommodate between 205MB and 30GB of local disk storage, as well as 384 workstations. Up to four Unibus and four Massbus adapters may be used for connection to mass storage devices and other peripherals. The VAX-11/780 can be upgraded to the VAX-11/785.

The VAX-11/785 incorporates high-speed Schottky circuitry that, according to Digital, permits performance 50 to 70 percent greater than that provided by the VAX-11/780. The VAX-11/785, like the VAX-11/780, features a local main memory capacity of 64MB and a two-way set associative cache memory; cache size on the VAX-11/785, however, is 32KB. The floating-point instruction set on the VAX-11/785 features G and H data types, which are optional on the VAX-11/780. An optional floating-point accelerator is available for the VAX-11/785. The 11/780 ►

► **MANUFACTURER:** Digital Equipment Corporation, 146 Main Street, Maynard, MA 01754-2571. Telephone (617) 897-5111.

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DATA FORMATS

BASIC UNIT: 32-bit word.

FIXED-POINT OPERANDS: Please refer to the "DEC VAX 8000 Systems" report in this volume.

FLOATING-POINT OPERANDS: The VAX instruction set supports floating-point data in longwords, quadwords, and octawords. Four types of floating-point data are available. Two types—D and G—are eight bytes long; the third type—F—is four bytes long; the last type—H—is 16 bytes long. Data type F is single-precision; type D is double-precision.

An optional high-performance Floating-Point Accelerator (FPA) can be added to the VAX-11 systems. The FPA is an independent processor that executes in parallel with the base CPU. The FPA takes advantage of the CPU's instruction buffer to prefetch instructions and memory cache to access main memory. Once the CPU has the required data, the FPA overrides the normal execution flow of the standard floating-point microcode and forces use of its own code. Then, while the FPA is executing, the CPU can be performing other operations in parallel.

INSTRUCTIONS: The VAX-11/785 features an instruction set that performs 304 basic operations; the VAX-11/780 and 11/750 instruction sets perform 248 basic ►