DS350 series: PDP-11 - based commercial data processing

The DECDATASYSTEM 350 (DS 350) series is Digital's upward-compatible PDP-11-based range of computers designed for commercial applications. As such, the series represents the extension of capabilities also found in the DS 310 system.

The DS 350 line consists of three basic models — the DS 352 (with dual floppy-disk drives), the DS 354 (with two 2.4 Mb removable cartridge disk drives) and the DS 356 (with up to eight 20 Mb disk pack drives).

The operating system supplied with the DS 350 series is known as Commercial Operating System 350 (COS 350). Application programs are implemented in an easy-to-learn high-level language known as DIBOL-11.

Features of DS 350 systems include:
- operation in a time-sharing mode, allowing four or five terminals to access the computer simultaneously;
- support of either visual-display or hard-copy terminals;
- core-residence of all active programs;
- execution of tasks (programs) in detached mode, allowing creation of background tasks not requiring interaction with a terminal;
- direct communication between tasks, via core memory;
- both access and update of files, simultaneously and by multiple users; the record-locking facility avoids contention problems;
- support of multi-volume files, allowing files to be distributed across a number of disk drives;
- dynamic allocation of memory amongst users, avoiding the need for fixed partitions;
- spooling of line-printer output, with a consequent increase in system productivity;
- provision of a wide range of utilities to ease program development;
- option for computer-to-computer communication through a 2780 emulator package.

Typical system costs for the range (including sales tax) are: DS 352, $23,000; DS 354, $35,000; DS 356, $57,000.

DECsystem 1088: top of the -10s

DECsystem-1088 is the most powerful member of Digital's large-scale computer line. The new dual-processor configuration offers high availability and delivers performance per dollar as much as twice that of comparable competitive systems. The new configuration has typical system performance improvements over the single-processor DECsystem-1080 ranging between 1.4 and 1.7.

The basic DECsystem-1088 configuration consists of two KL10 central processors, 256K words of 36-bit memory, a disk system with two 88 megabyte drives, a magnetic tape system with 320 KHz tape drives, a 32-line communications system, a 1,200 line per minute printer, and a 1,000 card per minute reader.

By duplicating the communications, mass storage and unit record subsystems, the system can be expanded into a dual DECsystem-1080 configuration with redundancy for key operations offering both maximum system availability and throughput.

The new configuration is fully software compatible with other members of the DECsystem-10 family.

Standard DECsystem-1080s, the previous top-of-the-line large computer configuration, can be field-upgraded to DECsystem-1088s by the addition of a second KL10 central processing unit.

The DECsystem-1088 needs only the environment required for conventional computer rooms, so that environmental support costs will be significantly lower than for other equivalent systems, adding to overall operating savings.

Markets for the DECsystem-1088 are anticipated to include Government departments, educational institutions, business, medicine, science, and engineering. Typical applications include accounting and administration, order entry and inventory, general purpose timesharing, and complex scientific or engineering calculations.

Concurrent with announcement of the DECsystem-1088, new software packages, Galaxy Batch and ITPS-10, were introduced.

The new Batch package, which can run on DECsystem-1060 and -1080 systems as well as the -1088, provides a 50 percent reduction in both real-time and central processor times over the previously available batch processing software package, MPB-1.

Galaxy Batch, which is designed to be particularly efficient in a virtual memory environment, also provides a 75 to 90 percent reduction in disk access over the former package. The new Batch package complements the system's strengths in timesharing, as it can be used in interactive as well as production batch requirements.

ITPS-10, the other new software package, is a text preparation package that permits DECsystem-10 users to prepare office-quality documents or camera-ready copy for photo-composition, typesetting, and word processing.

Text editing can be performed on video terminals to save paper and enable rapid turnaround time.

Output can be in the form of photocomposition tapes or office-quality printing.

Justification and hyphenation and formatting are performed automatically by the system, which can accommodate output devices ranging from inexpensive line printers and teletypewriters to high-quality photocomposition machines.

DECsystem-1088 configurations are priced from $1,225,540. First deliveries are scheduled for December 1976.

11T55: standard fast-Fortran

The 11T55 is a new disk-based standard PDP-11 system designed specifically to provide fast performance for Fortran IV applications.

The 11T55 system includes a PDP-11/55 processor, a new floating point processor, and 32K words of high-speed (300 nanoseconds) bi-polar memory.

Operating under RSX-11M operating system in a dual disk-pack configuration, the 11T55's Fortran IV Plus compiler produces highly optimised Fortran programs

The system is expected to be used extensively for education and engineering computation, statistical and scientific analysis, and industrial control.

Prices for the 11T55 begin at $61,000. Deliveries will begin from July 1976.

DZ11: flexible multiplexor

The DZ11 is an asynchronous multiplexor which has been designed to reduce the cost of interfacing multiple terminals to PDP-11 systems where terminal I/O throughput is moderate.

The DZ11 can connect both local and dial-up terminals and can also connect multiple systems using asynchronous DECnet links. The basic 8-line unit can be expanded at low cost to 16 lines.

The device is a single-board design using LSI circuitry. It will be supported by all Digital's major multi-terminal operating systems.

Features of the DZ11 include programmable line-speeds and formats on a per-line basis; availability of all common character formats; range of 15 line-speeds from 50 to 9600 baud.

Deliveries will begin in November, 1976.

Cartridge disks give DS310 13.5 Mb database capability

The RKO5 cartridge disk storage option for Digital's low-cost Datasystem 310 business computer allows an additional 3.2 Mb of on-line storage.

Cartridge disk drive, disk controller and cabinet cost $8,800. Up to three additional drives can be added at a price of $5,100 each, for a total of 12.8 Mb of additional storage, or approximately 13.5 Mb total.

The augmented system is intended for applications requiring larger data bases than the original DS 310 could accommodate.

The basic DS 310 is housed in a desk-sized, desk-shaped cabinet, incorporates a PDP-8A computer, floppy-disk mass storage drives and a video terminal. Price starts at $12,000 for single units.

The data storage capacity of the basic DS 310 is expandable up to 1.2 Mb using floppy disks only.

Application programming for the system in all its configurations can be performed in DIBOL (Digital Business Oriented Language) operating under the COS 310 (Commercial Operating System) executive.

The DS 310 can be used as a stand-alone computer system, or can be employed as a satellite to a central computer while retaining great independent power.

New 11/04, 11/34 will enhance strength of the PDP-11 family

The PDP-11/04 and PDP-11/34 are new computers in Digital's widely-used PDP-11 family, and offer substantial price/performance advantages over longer-established PDP-11 machines such as the 11/05-10 and 11/35.

The two new computers are companion products, sharing many components and gaining much of their price advantage from the resulting manufacturing cost savings. Different processor modules are used on each machine, the hardware multiply-divide feature which is standard on the 11/34 is an option on the 11/04, and while the memory of the 11/04 is limited to 28K the 11/34 is expandable to as high as 124K words. Memory on both machines may be core, MOS, or a combination of each.

The 11/04 duplicates the instruction set of the current 11/05, while the 11/34's instruction set is identical with that of the current 11/40. RT-11, RSX-11M and RSX-11S operating systems will run on both machines. In addition, RSTS/E will run on the 11/34.

Both the 11/04 and the 11/34 offer self-test diagnostic features and automatic bootstrapping.

First deliveries of the new machines will be October, 1976. Single-unit price for a 16K word 11/34 processor starts at $9,290; single unit price for an 8K 11/04 starts at $3,795.

Quantity discounts are also available.

DMS500: file-handling systems software for business PDP-11s

DMS-500 is a newly-announced systems software package within the CTS/E-500 operating system used by Digital's top-end PDP-11-based commercial systems. The package is also available to existing users of CTS/E-500.

DMS-500 can be used with application programs written in Basic-Plus to organise and process data structured in indexed-random (IAM), indexed-sequential (ISAM) and relative-access (RAM) files.

Interactive utility routines are provided to define, allocate and organise data in DMS-500 file structures.

Control is provided to avoid contention problems where multiple concurrently-operating user programs are retrieving or updating records within the same data file structures.

An extended SORT utility is provided to sequence data maintained in either IAM and ISAM/RAM files, or in normal record I/O files in blocked-record formats. This SORT has multi-volume capabilities.

IAM under DMS-500

IAM provides random access to a data file via a randomly organised key file. The key may be of up to 63 bytes in length while each data record may consist of up to 511 bytes.

IAM supports only single volume files.

ISAM/RAM under DMS-500

ISAM/RAM provides access to a data file either via a key file organised sequentially or via the specification of a relative record number.

Using ISAM, the key may be of up to 64 bytes and each record can consist of up to 508 bytes. The key used may be the actual key, an approximate key or a generic key.

The ISAM implementation allows the user to specify distributed free space, file expansion areas and the segregation of data and index structures.

Data file attributes and load factor ratios can be specified to consider the frequency of update activity and the amount of new data to be added to data structures.

The user specifies the number of index levels desired.

While IAM only supports a single volume file, ISAM/RAM allows a file to consist of up to seven volumes which may reside on the same or separate devices. Using this technique a file may consist of up to 448,000 blocks, each block containing 512 bytes.

ISAM file organisation is particularly appropriate for data that is to be accessed in some mix of both random-by-key-value and sequential modes. RAM is best suited to application programs requiring the most efficient random access to stored data file. File structures can be created using a combination of both ISAM and RAM.

Extended SORT utility

The extended SORT utility provides the capability of sorting disk-resident files containing logical data records up to 512 bytes in length.

A multi-volume file capacity enables eight separate, but logically contiguous data volumes on disk to be either input or output to the extended sort.

At the user's options, either a re-ordered data file or key file may be output.

Up to 15 key fields, each with either ascending or descending key order, may be specified.

Benefits of DMS-500

- operates with the current CTS/E and Basic-Plus software;
- simplifies input/output data handling in user programmes;
- provides file structures familiar to EDP users;
- allows users to select the appropriate access method;
- provides on-line access-oriented data protection mechanisms;
- allows generation of more extensive file management techniques using DMS-500 as the base.