



digital PDP-10
DIGITAL EQUIPMENT CORPORATION

36 - Bit Word

365 Instructions Including:

- All Boolean Operations
- Immediate Operands
- Programmed Operators
- Memory Increment, Decrement and/or Test
- To-memory Operations
- Floating Point*
- Flexible Byte Manipulation*

Multi-Level Indirect Addressing

16 General Purpose Registers Used For:

- 16 Accumulators
- 15 Index Registers
- High Speed Program Loops

Nested Priority Interrupt System

Flexible Operator's Console

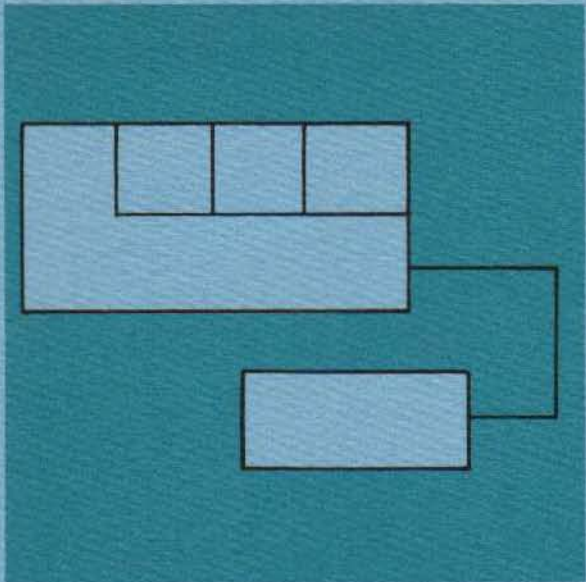
1.0 μ sec Memory Cycle

Input/Output Bus for easy connection of peripherals

Memory Bus allows easy expansion interleaving of memory modules.

*Optional





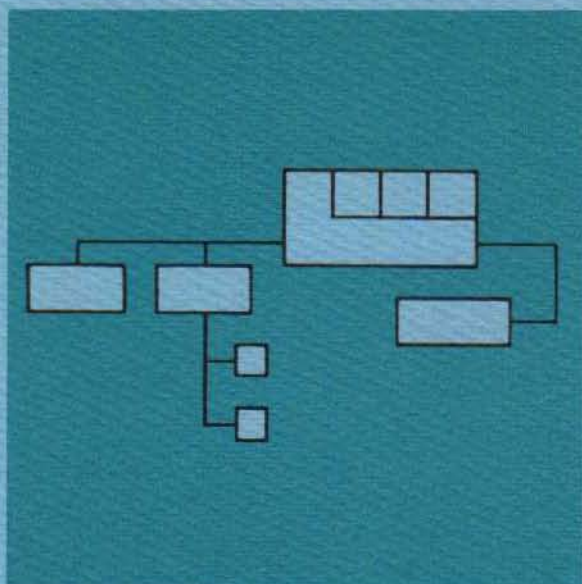
PDP-10/10

The smallest of the PDP-10 family, 10/10, offers the user a very powerful, general purpose stored program computer system. Designed for single application scientific computing, real time control and on-line data processing, the 10/10 offers a hard to beat combination of technically advanced hardware and proven software.

In the race for computing economy DEC did not overlook expandability, compatibility nor future growth. PDP-10/10 software is designed to provide upward compatibility with the software systems provided for the larger members of the PDP-10 family. All language translators, FORTRAN object programs, editors and utility programs call on the resident I/O control package in a consistent way throughout the PDP-10 Line. The hardware is designed for field expansion with minimum down-time. Processor options not present in the PDP-10/10 are software simulated to insure total system compatibility and to provide consistent usage of PDP-10's powerful instruction repertoire at any configuration level and to insure interchange of user programs.

The PDP-10/10 programming package includes a basic FORTRAN IV compiler which produces highly optimized object code and a resident I/O package designed to enable device independence for user programs. Other major system components include the MACRO-10 Assembler, a powerful context editor (TECO), on-line symbolic debugging (DDT) plus the Science Library of Subroutines, and many utility programs.

PDP-10/10 is only the first step in the construction of a powerful laboratory computer system and is designed and priced to encourage initially small configurations which will grow with the departmental budget and the experimenter's requirements.



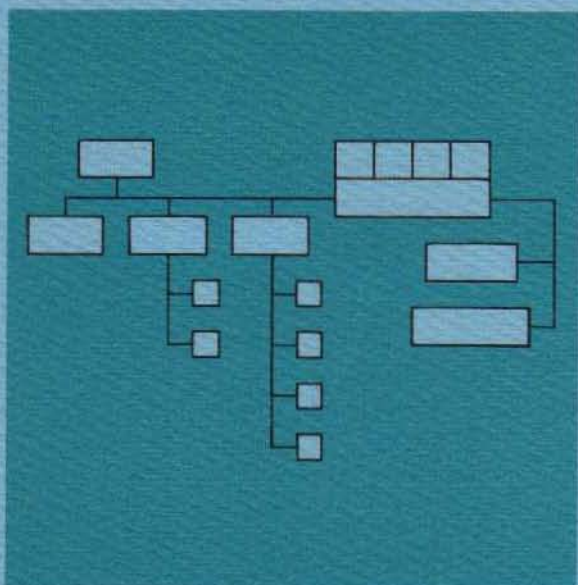
PDP-10/20

The second member of the PDP-10 family, the 10/20 incorporates all the features of the standard PDP-10 central processor system and introduces DECtape, an extremely versatile, file structured, low cost magnetic tape system.

Utilizing DECtape the 10/20 Monitor facilitates job-to-job transition, overlaps I/O with computation, and permits run time selection of I/O devices. Job save and restore features permit efficient utilization of both computer and programmer time allowing quick response to laboratory experiments and program modification. A user can interrupt a program at any point and save it on DECtape for continuation, or restarting at a later time.

Monitors are customized at each installation to provide only the I/O service routines needed. It is provided to users as a set of distinct subprograms; and another program, called "System Builder", accepts system parameters and generates the Monitor. Users also select I/O service routines to handle standard peripheral and/or they may provide their own I/O service routines for non-standard or special devices.

PDP-10/20 with 8,192 words of core memory and 2DEC-tapes utilizes efficiently all the standard system programs in a conversational language from a single-user console. Designed for the scientist on a budget, the 10/20 provides a small, powerful computer system that can grow to meet the expanded needs of the future.

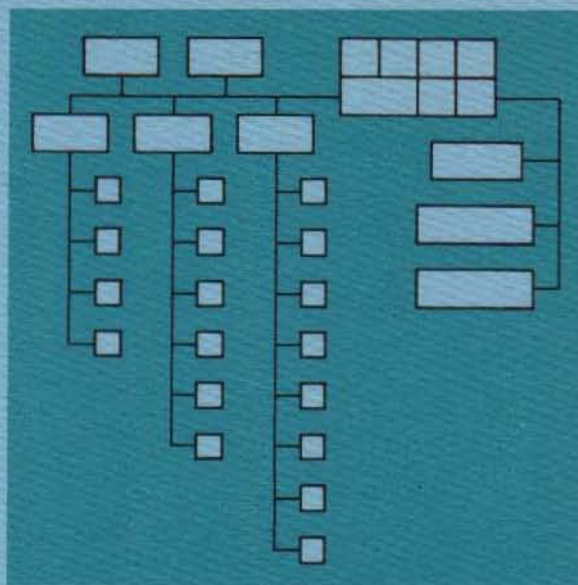


PDP-10/30

The third member of the PDP-10 family, the PDP-10/30, is a medium size, general purpose single-user computer system. Medium because it has only 16,384 words of core memory and a small number of I/O devices dedicated to areas of computing associated with science and industry, biomedical analysis, real time control, atomic energy, physics, and control of industrial processes. The 16,384 word memory of the 10/30 permits the higher efficiency FORTRAN IV, better and more powerful user programs, yet still the same I/O control package of the smaller 10/10 and 10/20.

Combined with the competitive low initial cost of the central processor, PDP-10/30 expands gracefully and economically. The software of the 10/30 has been evaluated, tested, and proven in the areas which have traditionally made PDP's a popular choice.

What keeps the 10/30 from being classified as a large computer? Only the price and DEC's definition! If PDP-10 is required to do real time control and general purpose computing at the same time, all that needs to be added to the 10/30 is the processor protection-relocation feature (1-hour field-installed) and a new routine for the Monitor, and it's grown to the 10/40. That's all the difference between 10/30 and 10/40. Even the price difference is hardly detectable.



PDP-10/40

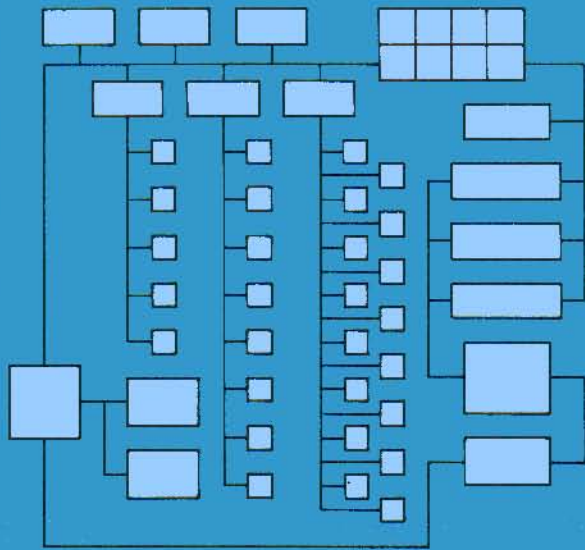
The next member of the PDP-10 family, PDP-10/40, has caught the pace of today's computer age by offering complete general purpose multiprogramming and time-sharing capabilities. Uniquely, the PDP-10/40 multiprogramming system has been in operation for the past two years at approximately 20 customer installations.

The 10/40 multiprogramming package permits as many independent programs as will fit in core memory to be active there simultaneously. Control is transferred rapidly from one user program to another and all I/O, job transition and scheduling is under control of a very sophisticated monitor program.

The high-performance arithmetic processor with byte manipulation, floating point hardware and memory protection and relocation is coupled with extremely flexible I/O devices such as DECtape, Magnetic Tape, Data Communication Controllers, card equipment, and real time I/O channels to give the customer a complete and integrated hardware-software system to meet the varied demands placed upon today's computing systems.

A customer need not understand all the techniques of computer programming to solve problems utilizing the extremely flexible and highly versatile conversational dialect of the monitor system. PDP-10/40 has emphasized quick response to problem solving, thus placing the burden on the system rather than on the scientist. PDP-10/40 truly offers a working tool dedicated to solving a single multi-level problem or simultaneously solving many problems.

The PDP-10/40 system is aimed at the departmental level of computing requirements where users understand both the system and their problems and wish to take the direct route to an efficient and economical solution.



The PDP-10/50

This system is the ultimate in a series of five software steps through the continuously expandable PDP-10 spectrum. While a PDP-10/50 can grow to incorporate any amount of core memory (up to 262K) and any set of peripheral devices, its distinguishing characteristic is that it incorporates complete general purpose time sharing with core swapping. Like the PDP-10/40 it is a multiprogramming system wherein multiple independent programs share time and memory space, but the number of simultaneous tasks which the system can accommodate is far greater than the number which might fit in core at once.

A sophisticated software package which performs scheduling, core shuffling, and swapping efficiently coordinates the execution of many jobs, keeping inactive ones on retrievable storage, optimally reorganizing memory, and overlapping swapping with computation. A high-performance disk file with a direct data path to memory provides excellent response time for conversational users.

The disk file adds a new dimension to the already flexible PDP-10 user file storage system. The disk service routine provides nine levels of file protection and permits independent jobs to share data files.

Both PDP-10/40 and 10/50 systems are designed to accommodate real-time, batch processed, and conversational jobs—concurrently. A typical job mix running under the control of the PDP-10/50 monitor might include one or more time critical jobs with highest priority, one or more batch control programs each executing a stack of user jobs, and up to a dozen or more conversational console users doing on-line editing, compiling, debugging, etc.

MONITOR—Standard single-user monitor and expanded multiprogrammed and time sharing-swapping monitor. Controls real time, batch and time-sharing concurrently.

FORTRAN IV—ASA standard single-pass compiler with highly optimized object code fully exploiting PDP-10's powerful instruction set.

MACRO ASSEMBLER—Flexible assembly language with sophisticated macro facilities and many special data generating, conditional assembly, listing and control pseudo-operations.

TECO—Powerful context editor with sophisticated macro facilities, and iterative string search, match, and substitution operations.

DDT—Famous on-line symbolic debugging aid with more than 50 commands, permitting dynamic interaction with running programs.

LINKING LOADER—Loads and links independently assembled or compiled relocatable or absolute binary programs. Twenty special options including automatic library search and chaining facilities.

PERIPHERAL INTERCHANGE—Transfers alphanumeric or binary data from or to any I/O device with optional editing, sequencing, merging, and syntax checking features.

FORTRAN IV OPERATING SYSTEM—More than 100 library routines including double precision and complex functions. Dump and chain facilities. Dynamic assignment of I/O devices.



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