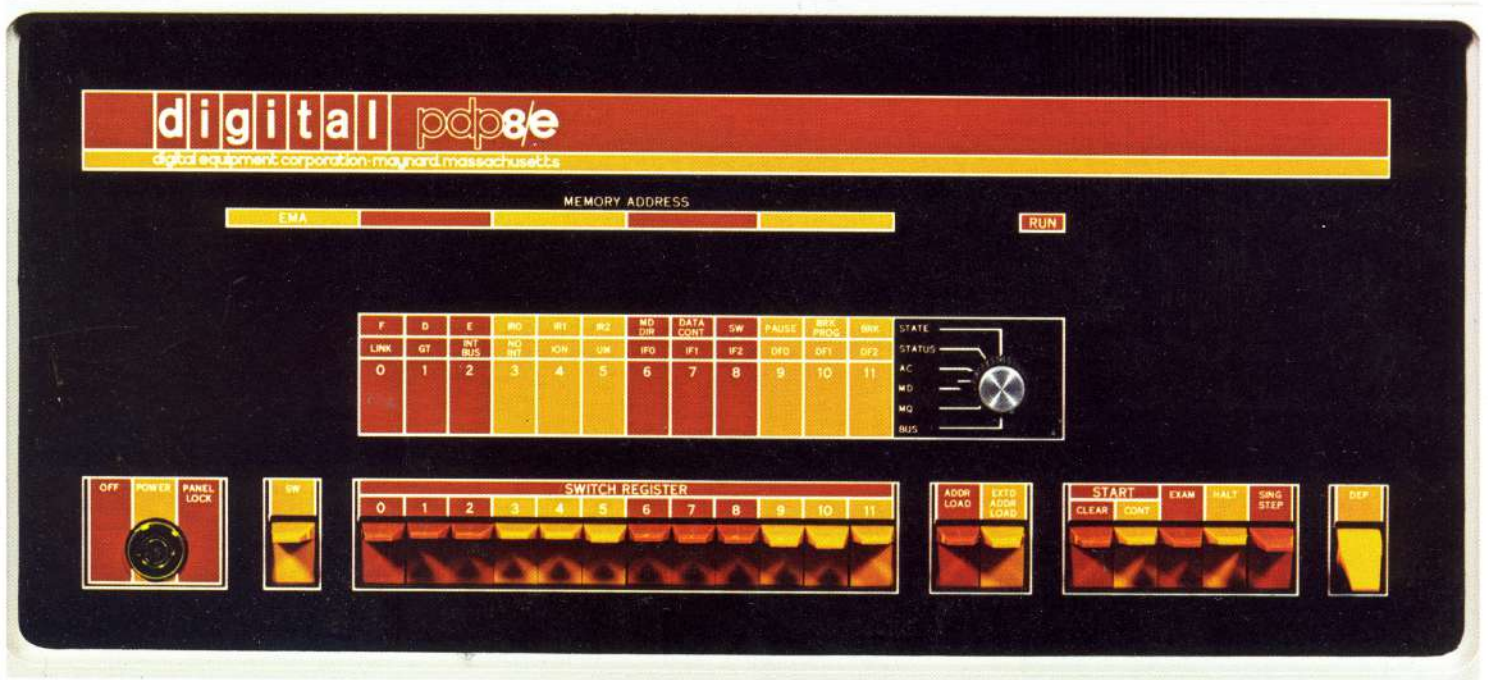


digital

Newest members of  
the world's most popular  
minicomputer family

PDP-8/€  
PDP-8/F  
PDP-8/M





Take a good product and continually improve it —that's the design philosophy so aptly illustrated by DIGITAL's PDP-8 computer systems.

Since its introduction in 1964, the PDP-8—the world's first small computer—has been continually improved. Each new model has been more powerful and more efficient; at the same time, system-to-system compatibility has been maintained so that programs written for even the earliest PDP-8's can be run on the newest versions. The most significant improvement, though, is one of price; the PDP-8 you buy today costs only about one seventh of the price of the original PDP-8.

More standard and special systems options are available with the PDP-8 than with any other minicomputer, and more software, too—popular problem-solving languages, a business language, six assemblers, several operating systems, and a wide range of on-line utility programs. You can also draw upon the software experience of your colleagues through DECUS, the Digital Equipment Computer Users Society, the largest users' group in the world. Through DECUS you will have access to over 700 specialized programs.

The success of the PDP-8—over 18,000 installations to date—is also a measure of the effectiveness of DIGITAL's world-wide field service organization. Over 1,500 service engineers are responsible for factory acceptance of every computer system before it is shipped, as well as for its installation. Software specialists are also assigned to DIGITAL's field offices to provide a quick response to any software question.

Flexible service arrangements allow you to custom-design your maintenance coverage with contractual arrangements that vary from full-time, on-site engineers to on-call service during specific shifts. Some offices even provide a fully equipped service depot where you can leave a unit for repair and thereby further reduce your service costs.

For training in both software and hardware, DIGITAL maintains fully staffed facilities in Maynard, Massachusetts; Sunnyvale, California; Reading, England; and Munich, Germany. Courses can also be given at your plant or office by special arrangement. PDP-8 courses include an introduction to programming; paper-tape programming; OS/8 Operating System programming; PDP-8 hardware familiarization and interfacing; computer maintenance; and options and peripherals maintenance.

DIGITAL also provides other customer services. A Computer Special Systems Group designs non-standard options and peripherals to your specifications. A Systems Engineering Group specializes in the development of multi-processor networks. And the Logic Products Group develops unique control interfaces and devices employing DIGITAL-designed and fabricated logic modules.

The following groups serve specific application areas: The Industrial Products Group handles industrial-control and data-acquisition applications. The Laboratory Data Products Group is responsible for laboratory systems in the physical and life sciences. The Medical Systems Group specializes in products for hospitals and diagnostic clinics. A Graphics Arts Group supplies computerized typesetting systems and other graphics products to the newspaper and publishing community. The Edusystem Group specializes in systems for secondary schools, junior colleges, and universities. The Business Products Group handles commercial data-processing systems. And the Communications Group supplies products that meet the requirements of the fast-growing communications industry.

A separate group also handles the needs of the Original Equipment Manufacturer (OEM). The PDP-8/M, for example, is a version of the PDP-8/E with options, prices, and services designed to cover the diverse range of OEM needs.

STATE

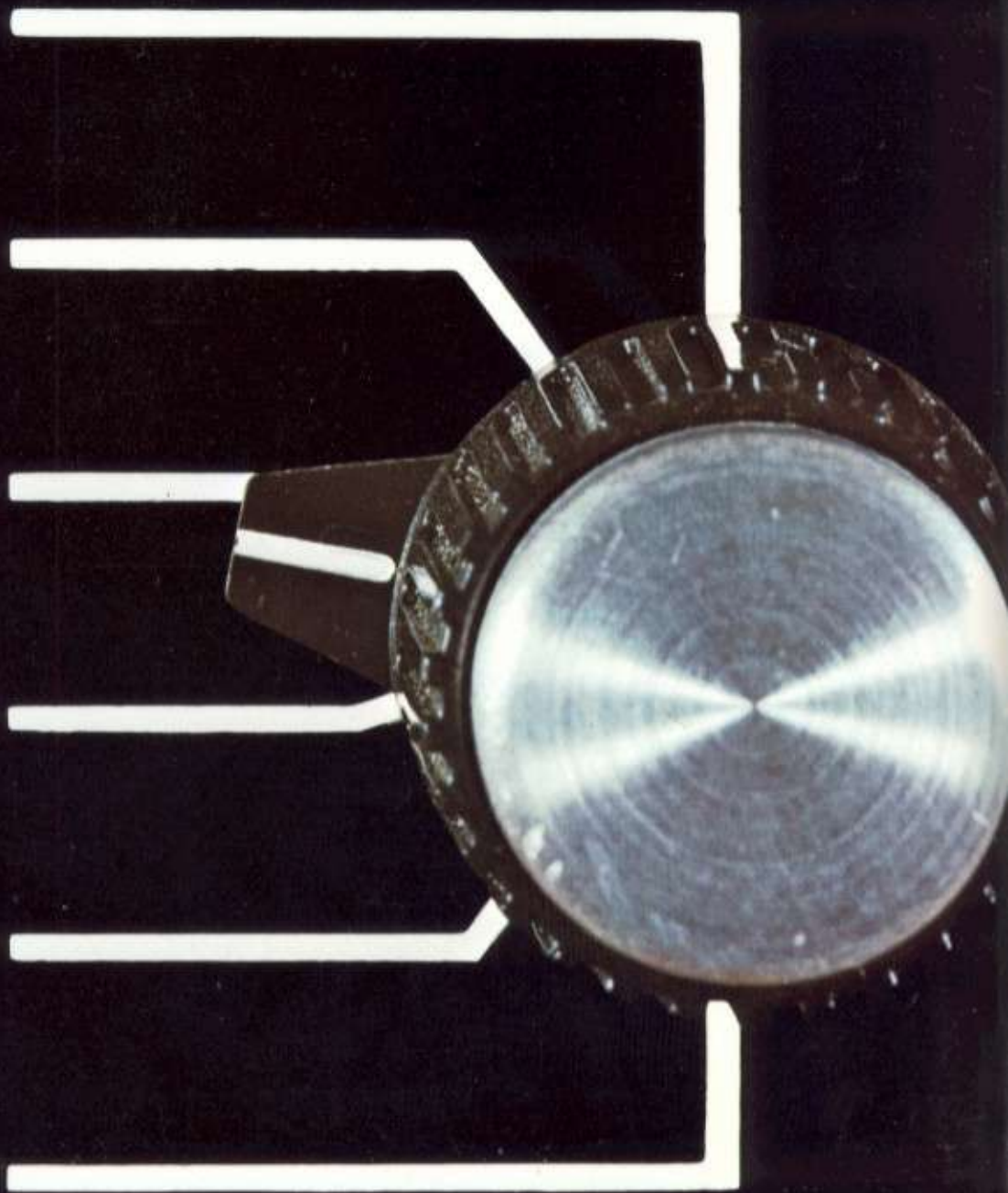
STATUS

AC

MD

MQ

BUS



## Reliability: A PDP-8 Byword

The reliability of PDP-8 computers is a field-proven fact. Of the 18,000 PDP-8's delivered, almost all are still in operation, many in demanding applications. And if the record isn't enough, a calculated MTBF (mean time between failures) study reveals that a PDP-8 system consisting of a processor, a 4096-word memory, a power supply, and a programmer's console will average over 8000 hours between failures!

This amazing number is the result of engineering quality and a stringent testing program that makes liberal use of PDP-8's to test other PDP-8's. Every part—from discrete components to complex integrated circuits—are tested and retested throughout the manufacturing process; marginal components are eliminated so that only the highest quality materials are included in the system you buy.

Fully assembled computers are tested on DIGITAL's acceptance-test line where a series of 64 test stations are controlled by a dual PDP-8 system. The master PDP-8 automatically puts each system through repetitive diagnostic exercises. Additional tests can also be manually inserted by the technician if the system warrants closer inspection. Each fully tested system is then accepted by DIGITAL's Quality Assurance and Field Service Groups. A post-installation test is next; only when the system is fully operational in your plant or office is it handed over for your use.

With the careful testing that each PDP-8 undergoes, it's no wonder that PDP-8's are found in the most demanding applications—shipboard navigation, chemical-reactor control, radiation-therapy planning, news-wire communications services, and many others. And it's no wonder that so many of these PDP-8 systems are still in operation when competitive systems have long since retired.

## One... Two... Three PDP-8'S To Choose From

Which current PDP-8 do you need? All are electrically identical and have the same processing speeds and capabilities. The most economical approach to automating your task is to buy only as much computer and associated equipment as the job requires—which is why there are three PDP-8's!

Computers are usually offered as 'packages' tailored to the needs of either the OEM buyer, who incorporates the computer into a larger scheme, or the end user, who has a direct in-house application in mind. There are, however, no hard and fast rules to specifically identify you as an OEM or end user; your application determines which 'package' is right for you.

The PDP-8/E is generally the selection of an end user with a substantial task to perform. A typical -8/E system includes a processor, core memory, a data terminal, a tape control and drive, a programmer's table, a line printer, and a software operating system. The -8/E also offers the maximum expansion capability of the PDP-8 series. Installation, maintenance, and training are included as part of the purchase agreement. The PDP-8/M—the version usually preferred by OEM's—consists of a power supply, a central processor, core memory, a programmer's panel and somewhat less expandability than the -8/E. Any additional hardware or software required for the application are purchased separately. The -8/M is also available with a special panel for dedicated non-operator applications. The PDP-8/F is a reduced version of the PDP-8/E; it is an economy model intended primarily for the end user with a limited need.

Whatever your need, there's a PDP-8 waiting to do the job; your local DIGITAL sales engineer will be happy to apply the experience of 18,000 other PDP-8 users to the selection of the right model and the right options and peripherals at the right price for you.

# EMA

## An Organization For Flexibility, Expandability, And Economy

The three newest members of the PDP-8 family are all built around an identical functional organization that features a 12-bit word structure and a basic 1.2-microsecond timing cycle. Each model provides you with a central-processor unit (CPU) to perform control and arithmetic operations, a memory that can store 4096 (4K) data words and is expandable to 32,768 (32K) words, a crystal-controlled timing-signal generator, and a power supply. Rapid, automatic operation is accomplished through the built-in data-terminal interface, while the front-panel controls allow you to manually override programmed operations.

The heart of the PDP-8 is the CPU. Within the CPU logic circuits manipulate data between several hardware registers; the registers operate on the data specified in the program, access and decode instructions stored in the computer's memory, and ultimately present a result to a line printer, a paper-tape punch, a card punch, or to a video display system, or transmit control signals to peripheral devices.

The CPU provides, as standard equipment, the multiplexing capability for up to 12 Direct-Memory-Access devices. PDP-8 design permits a high-speed DMA device to interrupt within an instruction, providing a rapid bus latency. The PDP-8 is, therefore, an excellent handler of high-speed peripheral devices.

Your PDP-8 can be expanded, physically and functionally, to an extent not usually possible in a small-computer system. It is this unusual expansion capability that allows you to purchase only what you need to perform your present task and to later expand your system in parallel with the growth of your business. One reason for this expandability is the complete line of standard options and peripherals manufactured by DIGITAL for the PDP-8 family. A more important reason is the unique expansion concept embodied in PDP-8 computers: The OMNIBUS data path.

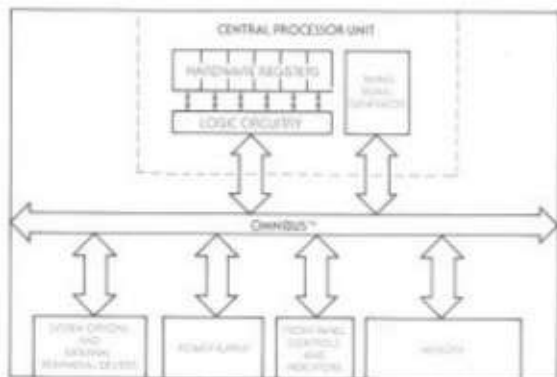
OMNIBUS is a horizontally mounted 'master' printed-circuit board to which a set of connector blocks is attached. The blocks are wave soldered to the master board so that random back-plane wiring and its attendant problems are reduced; the wave-soldering technique greatly enhances PDP-8 reliability and is a substantial factor in the 8000-hour MTBF.

# MEMORY

Other printed-circuit boards, which are the system options and the controls for external peripheral equipment, are inserted into slots in the connector blocks. Because all twenty slots in a basic OMNIBUS are electrically identical, the PDP-8 is, therefore, prewired for any option; a board (also called a quad module) can be inserted anywhere on the data path. Consequently, adding peripherals and options is a simple process, no slots are dedicated to a specific option, and available space is most efficiently used.

The OMNIBUS provides for easy and economical interfacing, allowing simple single-cycle DMA or I/O interfacing (usually on a single printed-circuit card). Thus, system economy is derived from a savings in rack space, power supplies (the interfacing device can use the computer's power supply), cabling, and fewer hardware items. In addition, all I/O instructions on the OMNIBUS can be executed in the basic cycle time of 1.2 microseconds.

Each basic computer contains one OMNIBUS with its twenty module slots. Eight to ten slots are required for your basic computers; the remaining slots are available for the options and peripherals required by your application. The extent of system



A simplified diagram of the PDP-8 organization. Note that in the world of the PDP-8, all system elements are linked together by the OMNIBUS, a unique communications device. Through the OMNIBUS and its expansion options, your PDP-8 can be upgraded to include a great array of processing options and external peripheral devices.

expansion beyond this point depends upon the PDP-8 model you select; this is where the three models begin to differ.

A PDP-8/E provides the maximum expansion capability. A second OMNIBUS can be incorporated into the basic enclosure, increasing the number of slots by 18. An expander box, that accepts up to two more OMNIBUS's, can then be added. Thus, a fully expanded PDP-8/E provides 74 slots, adequate for any application you might have in mind.

FF

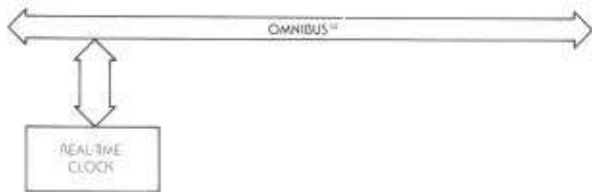
POWER

PAN  
LO

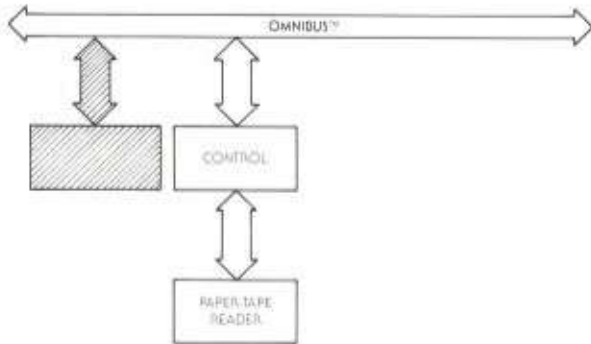




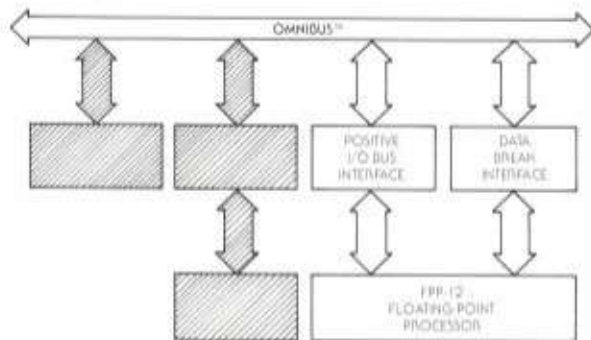
The diagrams below illustrate the OMNIBUS interfacing requirements of the three types of devices used with the PDP-8/E, -8/F, and -8/M.



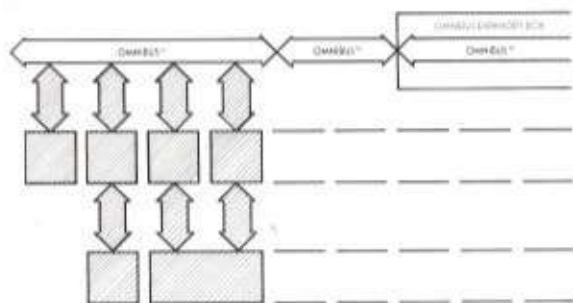
A. The first type of device plugs directly into the OMNIBUS. Devices of this type sometimes consist of multiple modules that are inserted into the OMNIBUS and are interconnected by cables across the tops of the modules.



B. The second device type consists of a control module and an external peripheral instrument. The control module plugs into the OMNIBUS and links to the peripheral by cable. Multiple control modules may sometimes be required for this type of device also.



C. The third type are those devices designed for use with the positive-polarity input/output bus and the data-break facility of earlier PDP-8's. Because of special design features and reliable performance, these devices remain in demand for the new PDP-8's. As a result, DIGITAL has developed the I/O bus and data-break interfaces that allow the use of these desirable peripherals with the newest PDP-8's.



D. A full-blown PDP-8 system consists of many of each type of expansion device tied to the original OMNIBUS and its extensions.

The basic -8/F and -8/M enclosures are smaller than that of the -8/E, and can accommodate only one OMNIBUS. Like the -8/E, however, an expander box can be added to bring the -8/F and -8/M capacity to 56 module slots.

The PDP-8 has a simple, but complete, instruction set which is very core efficient. The instruction set allows the development of programs both quickly and with the use of a minimum amount of memory. Should enhanced power be desired, the Extended Arithmetic Element can be added.

### Extended Arithmetic Element

The processing power of the PDP-8 can be dramatically increased through the optional Extended Arithmetic Element (EAE). The EAE enables the performance of complex arithmetic operations at high speed—implementing multiply and divide instructions, extended shifting operations, and double-precision arithmetic. Double-precision arithmetic is an example of the value of the EAE: The basic PDP-8 is capable of handling numbers up to 4096 (or between  $\pm 2047$ ), a sufficient range for some applications. With the EAE, however, the range is increased to  $16 \times 10^6$  (or  $\pm 8 \times 10^6$ ); this extended range makes the PDP-8 useful in almost any application. EAE-equipped PDP-8's can be found, in fact, in virtually every conceivable industrial and commercial environment in the world.

### Floating-Point Processor

For applications involving complex and prolonged arithmetic operations that, until now, could be performed only with larger and more expensive systems, DIGITAL offers the FPP-12 Floating-Point Processor option. The FPP-12 is an asynchronous parallel processor that retrieves instructions and accesses data from the PDP-8's core memory. Fixed- or floating-point calculations can be executed on 24-bit binary fractions (as opposed to the 12-bit, whole number limitation of a standard PDP-8). In addition, a double-precision option can be added to the FPP-12 to increase the binary-fraction bit capacity to 60 bits. Some of the special features on the FPP-12 are:

- High Speed—floating-point divide and multiply, for example, are executed in 30 and 23 microseconds, respectively.
- High Accuracy—accurate to seven significant digits.
- Large Addressability—32,768 words of memory are directly addressable.
- Large Instruction Set—34 defined instructions for maximum system flexibility.

## Conversation With Your PDP-8

Being the first and most popular minicomputer means that the PDP-8 offers you a great deal of debugged software upon which you can build your system; much of your software development is already done. Your PDP-8, however, can be 'taught' to participate in an endless variety of specific functions through the instructions you supply it. These instructions are transmitted to the machine in 'languages' that the machine 'understands.' The several PDP-8 machine languages are easy to learn and to use; the sophistication of the language you select will parallel the complexity of the job your PDP-8 is to perform and the capability of your programmers.

FOCAL (FOrmula CALculator) is an easy-to-learn conversational language designed specifically for small computers, a language that lets you quickly and easily solve a wide variety of numerical problems. It is an ideal introductory programming language that can run large programs with a minimum of core memory.

BASIC is a popular problem-solving language widely used for scientific and other applications. The language is simple enough for the neophyte programmer, yet provides features that give the sophisticated programmer a wide range of flexibility. BASIC is itself available in several versions, depending on the configuration and application of your PDP-8 system.

DIBOL (Digital Equipment Business-Oriented Language) is a complete business-oriented software system for the PDP-8. It contains a data-management system to provide automatic input, sorting, and file maintenance, as well as a monitor to tie its various subsystems together.

DIBOL allows a relatively inexperienced programmer to complete business applications on a small computer. It is directed toward the small business that can write its own data-processing management and accounting programs. The power of the PDP-8, through DIBOL, can be concentrated in programs for billing, accounts receivable, inventory control, payroll, general ledger, and other operations.

SWITCH R

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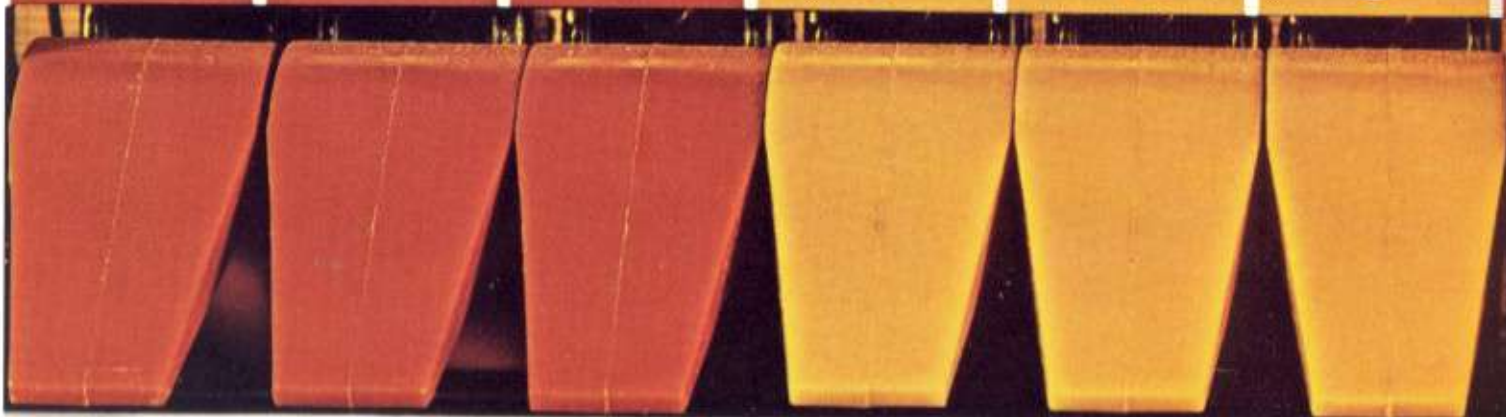
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ASSEMBLERS are also available for the PDP-8: Two paper-tape versions and four that operate from disk or DECtape. The six PDP-8 assemblers (known by the acronyms PAL-III, MACRO-8, PAL-D, OS/8 SABR, and OS/8 PAL-8) convert the symbolic language used by the programmer in writing programs to the corresponding binary numbers that the machine requires to 'understand' the programmer's intentions. The assembler you choose will serve your particular PDP-8 configuration, capacity, and application.

At a more sophisticated programming level are FORTRAN compilers. OS/8 FORTRAN is used with DECdisk or DECtape, eliminating the need for paper tape. This system permits the use of over 200 symbols and up to 1300 floating-point or 3900 fixed-point variables per program or subroutine. OS/8 FORTRAN features include automatic link loading, Hollerith constants, program chaining, and the ability to mix FORTRAN and assembly language code. RTPS FORTRAN IV operates with the optional FPP-12 Floating-Point Processor and offers exceptionally fast execution speeds as well as real-time capa-

bilities. RTPS FORTRAN IV allows up to 150 symbols and 3000 variables per program or subroutine, with special features such as direct access I/O, generalized array subscripting, Boolean operations, octal constants, multiple-level overlays, n-dimensional arrays, mixed-mode arithmetic, logical IF, and error trackback.

Writing a program in the selected language is not an end unto itself. The programmer must be able to edit and debug his programs, to assure their usefulness in the intended application. For these purposes, DIGITAL provides a Symbolic Editor and Dynamic Debugging Programs. Through the Symbolic Editor and a console keyboard, the programmer can write, modify (add, change, or delete material), and update his program. PDP-8 Dynamic Debugging Programs allow the programmer to debug a program on-line from the keyboard; he can control the execution of the program, stopping at pre-determined breakpoints, print out register contents or the contents of any memory location, change register contents, and perform many other related operations.

## REGISTER

6

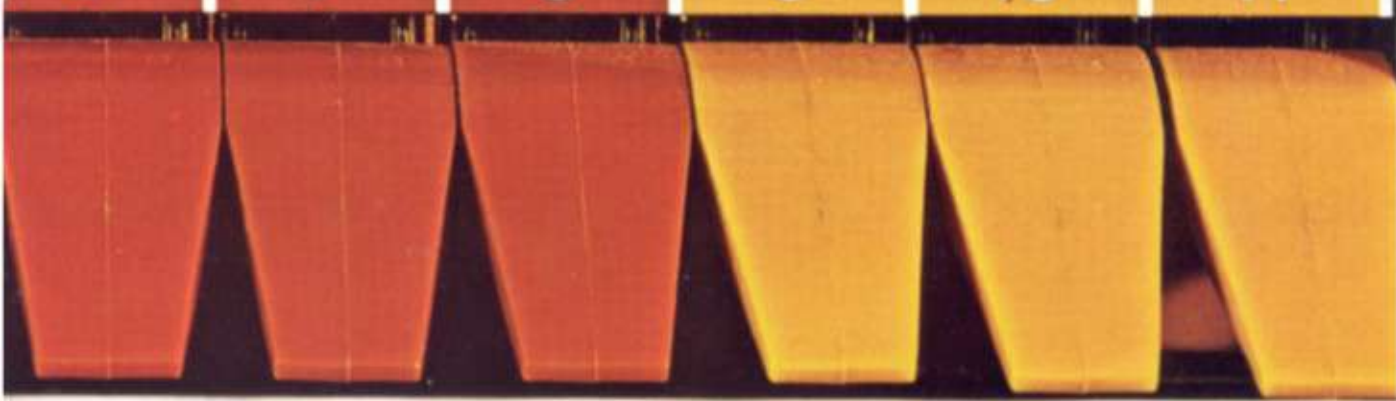
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11



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PROG

BRK

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DF2

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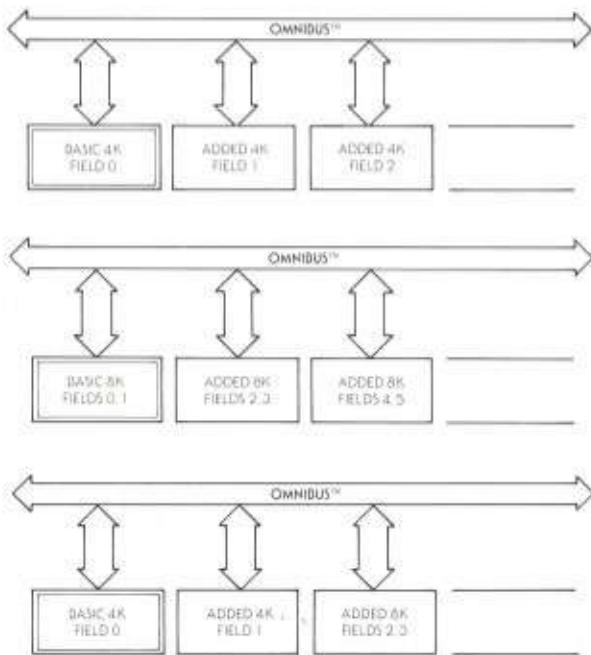
11

## Something To Remember By

A basic PDP-8 is initially equipped with either the MC8-E (4K word capacity) or MC8-EJ (8K) core-memory option, each of which can be expanded to a maximum of 32K words in 4K or 8K increments.

A variety of Read-Only Memories (ROM's) are also available. MR8-EA is a 256-word ROM in which the data to be stored is specified at the time of purchase and is established as the contents of the ROM during manufacture. MR8-EC, also a 256-word ROM, is used with the OS/8 Resident Operating System with the TD8-E DECtape option.

Another type of ROM is the Hardware Bootstrap Loader, MI8E. This option, containing 32 sequential address locations, automatically loads and starts the start-up program for a particular device, thereby eliminating the tedious operation of manual loading with the Programmer's Console. Loaders are available for all DECmagtape and DECdisk systems, and for both high- and low-speed Read-In Mode (RIM) paper-tape loaders.



These diagrams illustrate some variations of memory expansion in the PDP-8. The basic 4K or 8K memory purchased with any PDP-8 is expanded, as required for expanded needs and added peripherals, in 4K or 8K increments up to a maximum of 32K words.

## Special Operating Systems

Special-purpose software packages are available from DIGITAL as standard items for PDP-8 users in specific fields. By using the proper package, supplemented by the appropriate hardware and/or software, a PDP-8 system can be custom-fitted to particular requirements. Some of the special operating systems, offered through the Software Distribution Center are described below. OS/8 OPERATING SYSTEM is a comprehensive tape or disk executive system that simplifies both the development and execution of programs. OS/8 not only manages disk or DECtape storage, but provides a full complement of utilities and programs for efficient program development.

OS/8 provides a choice of language processors (OS/8 FORTRAN, OS/8 PAL-8, and SABR assemblers), absolute and relocatable loaders, and TECO, a powerful on-line editor. Other programs are PIP (Peripheral Interchange Program) and ODT (Octal Debugging Technique), which allows debugging without giving up valuable core space.

OS/8 provides access to any one of 15 I/O devices. The devices do not need to be pre-assigned, but can be chosen for optimum usage at run time.

With OS/8, programs can be developed in modules and later combined for execution; modules in different languages can also be combined. OS/8 also includes an integrated BATCH processor for efficient stacked job processing.

LAB-8/E is a special package for laboratory computing. At less cost than most special-purpose instruments, LAB-8/E includes an analog-to-digital converter, a real-time clock with three Schmitt-trigger inputs, point-plot display control, and, of course, the basic PDP-8/E computer.

LAB-8/E is designed for use as a total laboratory system, not as a computer with lab-type peripherals. It is being used in biomedical research for EEG, ECG, EMG, behavior studies, diagnostic assistance, patient monitoring, and similar applications. In analytical instrumentation,

F	D	E	IRO	IR1	I
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LAB-8/E is used for NMR work, electrochemistry, kinetic studies, reporting, instrument automation, etc. In engineering and science, LAB-8/E is used in simulation techniques and laboratory applications in physics, biology, and psychology. Industrial testing, sound and vibration analysis, real-time data acquisition, and data analysis make use of LAB-8/E.

PHA-8, a PULSE-HEIGHT ANALYSIS SYSTEM built around the PDP-8/E or -8/F, accumulates, stores, displays, and analyzes energy spectra, and records the results on a variety of output devices. PHA-8 is an on-line interactive system that invites the participation of the experimenter in investigating display regions and detecting errors during an on-going data-collection process.

Effective single-parameter PHA-8 software, with carefully defined separate coding sections, are readily available. Using machine-language coding, the experimenter is free to alter or add instructions, or even to develop new programs.

CDP (CHROMATOGRAPHIC DATA PROCESSOR) is a cost-effective gas and liquid analysis system with special features designed specifically for the chromatography lab.

The full-scale analog outputs from as many as 64 chromatographs are connected directly to the computer to eliminate the need for manual signal attenuation. Peak detection, integration, baseline correction, and area re-allocation for fused peaks are all performed automatically in an accurate and reproducible manner to eliminate manual strip-chart analysis. Peak identification, retention-time correction, area normalization, internal and external standard analysis, and calibration of response factors are performed automatically, and a complete analysis report is immediately printed on a laboratory Teletype at the completion of the chromatographic run. CDP increases the efficiency of laboratory personnel and instruments by automating tedious, time-consuming, and error-prone functions that are normally accomplished manually.

INDAC8, the INDUSTRIAL DATA ACQUISITION AND CONTROL SYSTEM, provides the industrial world with direct or supervisory control of analog controller setpoints, and monitors and controls sequential manufacturing processes, batching operations, and test procedures. Analog and digital subsystems supply a broad input and output capability through a variety of inter-

2	MD DIR	DATA CONT	
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changeable plug-in modules. A special optional housing protects the system's electronics from dust, dirt, fumes, heat, and corrosive atmospheres common in the industrial environment. INDAC8 systems also provide easy-to-use, English-language real-time software for data acquisition and control applications.

EDUSYSTEM, actually a series of systems, is a reliable, expandable, and instructionally complete classroom computer system for universities, junior colleges, high schools, and even lower grades. Designed as a complete instructional package, Edusystem offers a range of classroom computer systems that can update the calculator user to computers or fill the most ambitious computer science and administrative needs of the modern school. Time-proven curriculum materials and a comprehensive library of application programs in all subject areas are brought together in Edusystems as total instructional packages for the beginner or the sophisticated teacher/user. Each Edusystem is completely expandable to a higher level system without non-functioning leftovers or obsolete units. Edusystems also support Edusystem-EDP, a school administrative system for scheduling, grade reporting, attendance accounting, etc.

TIMESHARED-8 (TS8/E)—also known as Edusystem 50—combines powerful multi-language time-sharing software with the proven dependability and economy of the PDP-8/E. The system allows up to 17 users simultaneous access to a multi-language, interactive, resource/timesharing system. TS8/E runs an extremely powerful version of BASIC, as well as FORTRAN, Assembly language, FOCAL, and a full complement of utility software for editing, debugging, and device handling; all languages are available simultaneously.

TS8/E systems are in use for student problem-solving, science simulations, data reduction, business education, and administrative data-processing. Industrial firms and government agencies use TS8/E systems for software development, computation, production of numerical-control tapes, control of drafting machines, and a host of other applications.

COS 300 (COMMERCIAL OPERATING SYSTEM) is a commercial system that provides data-management capability for small to medium scale commercial applications. A self-contained disk- or tape-resident operating system, COS 300 includes DIBOL, a sort/merge package, a data entry package, system generation and maintenance programs, and a system monitor with device handlers.

COS 300 features include device independent input/output, a choice of batch or interactive operation, source line editing, disk or DECtape resident system environments, direct data access capability, user file directories, and a large system message library.

CAPS-8 (CASSETTE PROGRAMMING SYSTEM) incorporates the convenience of a magnetic-tape resident programming system with the adaptability of a paper-tape system. CAPS-8 provides interactive processing that utilizes monitor-based file handling techniques, languages and utility processors, and facilities for fault detection. The tape cassette is an unformatted, file structured, bulk-storage device containing the system executive and a library of system and user programs. The system executive supervises the overall program processing, including the loading and running of programs, the specifying of input files and output destination, and the chaining of programs.

## And Something Extra: Options And Peripherals

DIGITAL manufactures a complete line of options and peripherals to provide you with the means to satisfy the most sophisticated data-processing requirements. Lesser needs can also be satisfied through the variety of available devices that offer economical small-system management.

A PDP-8 system can be tailor-made for the most basic purpose and then gradually expanded as system requirements increase. A basic PDP-8 contains a CPU, 4K memory, power supply, and a programmer's console; the following list indicates the breadth of DIGITAL options and peripherals available to expand your system.

### Central-Processor Options

EAE Extended Arithmetic Element—Enables the performance of complex arithmetic operations at high speeds.

FPP-12 Floating-Point Processor—Provides the PDP-8 with a dual-processor capability for faster calculations.

Power Fail and Automatic Restart—Restores PDP-8 operation automatically after a power failure and protects the operating program.

Real-Time Clocks—Programmable, line-frequency, or crystal-controlled intervals.

### Mass-Storage Devices

Disk files store up to 6.4 million words; Magnetic-tape systems with 7- or 9-track tape; DEC-cassette tape system for economical single-track recording on 1-mil tape; DECtape system for ten-track recording on 1-mil tape at 2.7 million bits per reel.

Paper-Tape Readers and Punches—Punches up to 50 characters per second, reads up to 300 characters per second; 8-hole, fan-fold paper tape.

Card Readers—Marked or punched cards read at 300 cards per minute.

### Display Devices

Video and Writing Tablets—Alphanumeric and graphic display point-plot displays; light pens; telephone-line transmission.

Hard-Copy Devices—Incremental plotters; line printers with 64- or 96-character sets, 165 characters per second or up to 356 lines per minute.

### Data-Communications Devices

Synchronous Communications—Modem interface for Bell 201- and 300-series modems or equivalent; redundancy check option.

Asynchronous Communications—Serial-line interface at various send/receive Baud rates; single- or double-buffered interfaces; EIA or current-loop controls.

Automatic Calling Units—10-channel multiplexer; for Bell 801A and 801C or equivalent.

### Laboratory Devices

Analog-to-Digital Converters—10 bits; 16-channel multiplexer control; 8-channel multiplexer with preamplifiers; programmable gain up to +10 V.

Digital-to-Analog Converters—6 channels;  $\pm 10$  V, 10 mA.

Programmable Real-Time Clock—three Schmitt-trigger inputs.

Digital I/O.

### Terminals

CRT and Data-Entry Terminals—Alphanumeric; 16-character keyboards; standard telephone-line transmission up to 1200 Baud.

Teletype Terminals—Send and receive only; synchronous read and punch; friction or sprocket feed; modification kits to convert standard Teletype to DIGITAL standard.

Hard-Copy Terminals—Serial or parallel interfaces; selectable Baud rates up to 300 Baud or 30 characters per second, 80 columns, 64-character set. Read-only model also.



## PDP-8 Family Specifications

	PDP-8/M	PDP-8/F	PDP-8/E
Height	10.5 in. (26.7 cm)	10.5 in. (26.7 cm)	10.5 in. (26.7 cm)
Width	19 in. (48.3 cm)	19 in. (48.3 cm)	19 in. (48.3 cm)
Depth	17 in. (43.2 cm)	17 in. (43.2 cm)	23.25 in. (59 cm)
Weight (typical)	57 lb. (25.9 kg)	57 lb. (25.9 kg)	90 lb. (40.9 kg)
Power Requirements (typical)	95 to 130V 47 to 63 Hz 3 A	95 to 130V 47 to 63 Hz 3 A	95 to 130V 47 to 63 Hz 5 A
	190 to 260 V 47 to 63 Hz 1.5 A	190 to 260 V 47 to 63 Hz 1.5 A	190 to 260 V 47 to 63 Hz 2.5 A
Heat Dissipation (typical)	500 W	500 W	500 W
Environmental Requirements	Temperature: 32 to 131°F (0 to 55°C) Relative Humidity: 20 to 90%, without condensation		
Logic	Fully integrated TTL with MSI		
OMNIBUS Logic Levels	Ground and +3 V		

## A Last Word

These pages are really just an introduction to the PDP-8/E, -8/F, and -8/M. Getting into the depth of a complex machine like the PDP-8 requires, of course, a great deal more information than an introductory brochure could cover.

The next move is yours—just call or write your nearest DIGITAL sales representative and ask him for a copy of the PDP-8/E, PDP-8/F, and PDP-8/M Small Computer Handbook; in it are many of the details of the newest PDP-8's and their options and peripherals. Your DIGITAL representative will also show you how to get the most computer for your money through standard, production-line devices custom configured to your need—the PDP-8 family.







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