digital newsletter

PDP-14 Passes First Major Test

Computer Simulates Explorer Spacecraft

American Science and Engineering, Inc., a Cambridge, Mass. based research firm, has built a system centered around a **PDP-9** computer to simulate and ground check the operations of an Explorer spacecraft. The spacecraft will be used to measure celestial x-ray sources while in a minimum six month Earth orbit. The NASA-sponsored Explorer is being prepared for mid-1970 launch from San Marco, Africa. As the spacecraft orbits, the x-ray experiment data it collects will be digitized and sent back to the Earth via PCM telemetry in a serial bit stream.

The computer will essentially fill two roles. Before the capsule is sent into orbit, the PDP-9 computer will be used to check the operation of the experiment. This complete checkout will be performed by the computer and the interfaced peripherals, also supplied by DEC, in a 2-1/2 hour period. According to George Pegram, American Science and Engineering's senior systems engineer, without the computer it would take two engineers two weeks (or 160 hours) to do the same job.

SCOLDS for PDP-15 Announced

A software system designed to increase the efficiency of physics experiments has been developed for the **PDP-15** medium-scale computer.

The **Spark Chamber On-Line Data System, (SCOLDS),** is based on a similar software system developed for DEC's PDP-9. The PDP-15 is the successor to the PDP-9.

The SCOLDS system records information from spark chamber experiments on magnetic tape. It assists experiment set-up

DEC's recently introduced solid-state machine controller, the **PDP-14,** took its first giant step recently when an expanded configuration of the unit directed and helped monitor the operation of a 50 foot long, 23 station automotive transfer machine.

The machine builder is the **W.F. & John Barnes Company,** part of the Automated Machine Division of **Babcock & Wilcox.** Within one week of delivery, the PDP-14 was made fully operational by the Rockford, Illinois firm's in-house engineering staff under the direction of General Manager L.D. Clay.

Allan T. Devault, DEC's Control Products Manager, noted that although a number of other units are now in the field, the Barnes' demonstration was the first one in which the controller actually performed on the large scale for which it was designed.

"More important than what it did," he added, *"was the fact that the PDP-14 was programmed, debugged, and implemented*

*by Barnes' own staff with only nominal direct support from DEC."*

In addition to controlling the machine, designed for drilling, counterboring, reaming, and chamfering automobile cylinder blocks, the PDP-14 also transmitted production data to a small DEC PDP-8/L general purpose computer.

An article prepared by Louis D. Clay and Frank J. Long of Barnes for the September 22 issue of *American Machinist*, a leading metalworking trade magazine, stated in part:

"The new fixed-program control system and a mini-computer monitor were temporarily retrofitted for the demonstration of the transfer unit that had originally been designed, built and wired for control with a conventional hard-wired electromechanical relay system . . .

"The new control system will detect better than 85% of machine and control malfunctions — and predict many of
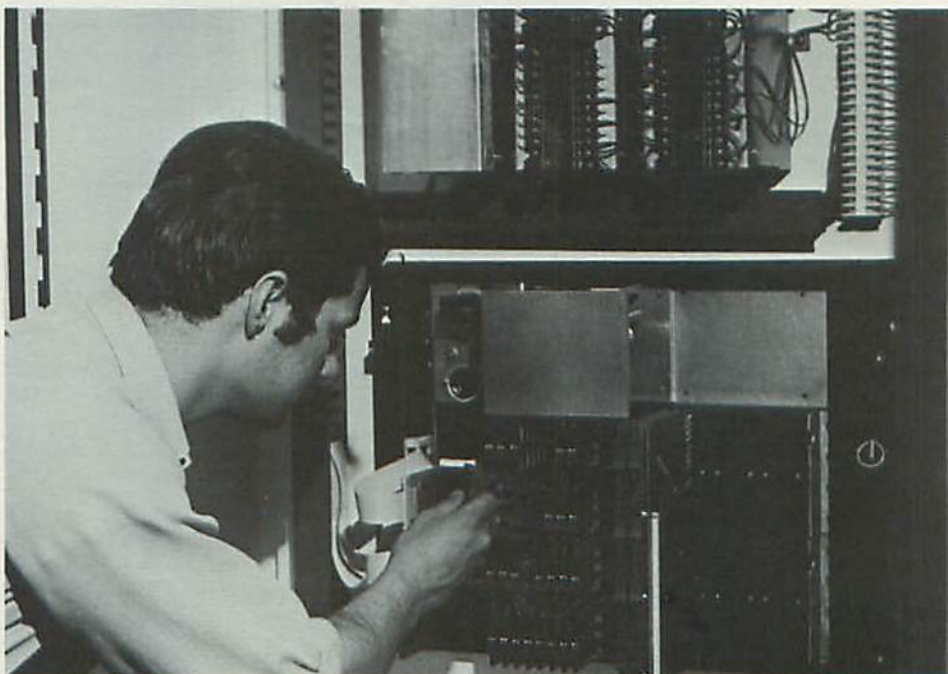
The PDP-14 is designed to control machinery used in repetitive, mass production manufacturing environments.

Toronto Firm Receives Largest PDP-10

The largest **PDP-10** time-sharing system shipped by DEC has been installed at **Dataline Systems Limited** of Toronto, a commercial time-sharing company in Ontario.

Dataline customers will use the PDP-10 for scientific and design problem solving, accounting and accounting analysis, computer assisted instruction, and data banks for storing statistical and financial data.

The PDP-10 system features 128K of 36-bit word core storage, and in Dataline's configuration, simultaneously can serve 120 time-sharing terminals while handling six batch processing jobs.

Other hardware includes two high-speed swapping disks with a total capacity of five million characters, eight 7- and 9-track tape drives, eight DECtape units, two high-speed line printers, one high-speed card reader and punch, and a 31-inch, on-line plotter.

Users can communicate with the PDP-10 system in BASIC, FORTRAN IV, MACRO, EDITOR, and, in the near future, in PDP-10 COBOL, as well as other computer languages. They can time-share with interactive languages or program batch operations and get responses in seconds.

A section of Dataline Systems Limited's computer center in Toronto shows part of their PDP-10, the largest ever delivered by DEC. Dataline time-sharing customers will use the PDP-10 for scientific and design problem solving, accounting analysis, and for data banks for storing statistical and financial data.

PDP-14 *(Cont. from pg. 1)*

them before they occur. When a malfunction occurs, its location and nature are spelled out for the machine operator and maintenance personnel. Repairs can be speeded because they don't have to search through electrical, mechanical and hydraulic systems until the trouble is located.

"In addition, replacement of dulled tools according to a preset schedule is assured. The computer keeps track of tool usage, and when optimum tool life is reached at a work station the operator is notified in advance so he can make any necessary preparations.

"Also, electromechanical relays are eliminated from the machine's control circuitry — thus eliminating what some manufacturing executives believe to be a major source of control system malfunctions.

The article continued: *"It's (control system) second and possibly more important function is to condition signals coming in from the machine's sensors so they can be presented to a computer for monitoring.*

"Even without using the monitoring computer, the transfer machine can be operated with the PDP-14 controller just as effectively as it was with the relays. In making this change, we have eliminated the relay maintenance problems that have been bothering manufacturing people in the automotive industry."

For more information on the PDP-14, check customer service box #2.

Explorer *(Cont. from pg. 1)*

In addition to the ground checkout function, the computer will fulfill a second vital role during the orbiting of the satellite. Data collected by the satellite will be transmitted through leased telephone lines from the tracking station to Goddard Space Flight Center in Maryland where it will be quick-look processed prior to transmission to AS & E. While collecting and recording the data on magnetic tape, the computer will be simultaneously monitoring the flight itself to see that the instruments are properly calibrated. It will also monitor vital functions by keeping check on the bit stream housekeeping voltages, temperatures, etc.

The recorded tapes of experiment data will be turned over to a larger computer, an IBM 360, for analysis.

Pegram remarked, *"The PDP-9 will do exactly what we want it to at the right price. It is big enough and fast enough to get the job done. We have been able to get the peripherals we want from DEC as well."*

The peripherals include a high speed tape reader and punch, a nine-track magnetic tape unit and controller, an analog-to-digital converter, a digital-to-analog output converter, two American Science and Engineering designed relay buffer controls, a buffer between the computer and telemetry output, a parallel-to-serial converter; a telemetry timing clock; and digital buffers for both the spacecraft simulator and the experiment simulator.
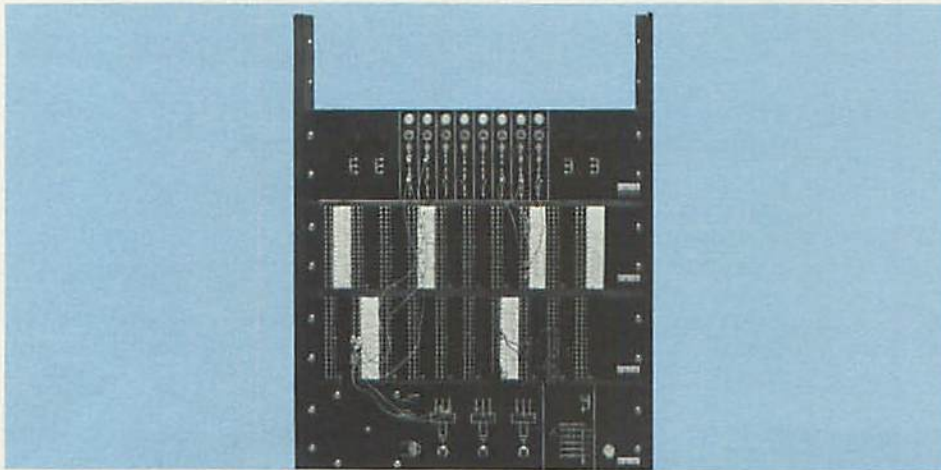
Industrial Control Logic Trainer Introduced

A self-teaching industrial control logic trainer, which also can be used to design and build control system prototypes, has been introduced by DEC's Control Products Line. Designated the K-Series Logic Lab, the unit is built using DEC's K-Series industrial control modules.

The Lab is accompanied by a workbook containing experiments and an introduction to logic and logic design. Either NEMA or MIL spec symbology can be used.

Citing the increasing need to educate potential users of solid state, Allan T. Devault, Manager of the Control Products Group, noted *"The best way to teach solid state logic is the hands-on approach, which the Logic Lab provides. Not only can the novice learn at his own rate, but experienced designers can use the Lab to design, build, and checkout control systems logic before committing additional resources to a project."*

In use, system wiring for each experiment or design is connected on the front panels using patchcords provided with the unit. Logic design can be tested by using a series of three manually operated switches that provide signals to the logic, or by a clock that automatically supplies test signals at any point in the system.

Priced at $995, a basic K-Series Lab is equipped with the necessary mounting racks, indicator panels, power supply, NEMA and/or MIL spec symbology cards, patchcords, and a variety of K-Series modules for instruction or design. The unit is expandable to accommodate larger control system designs. Deliveries are scheduled for January.

DEC, a leading supplier of solid state to the industrial controls market, publishes a number of handbooks on solid state, and manufactures two other teaching devices, the Computer Lab and R-Series Logic Lab, all designed as teaching and design aids.

For more information on the Industrial Control Logic Trainer, check customer service box #3.

Built from K-Series Industrial Control Modules, the K-Series Logic Lab is designed as a self trainer.

Ohio State University Installs PDP-10

The Computer and Information Science Research Center at the **Ohio State University** in Columbus, Ohio has installed a **PDP-10** computer to be used for researching the nature and properties of information.

The purpose of the center, associated with the Department of Computer and Information Science, is threefold: to develop a broad research program in computer and information science to practical situations; and to coordinate and integrate these functions with an academic program in computer and information science.

The university is presently adding to its already extensive 50-course curriculum in the computer sciences. More than 250 undergraduates and 100 graduate students are majoring in the program.

The PDP-10, acquired in part under a grant from the National Science Foundation, will complement the function of the existing Computer Center. The center's current equipment is dedicated to around-the-clock service to the entire university-user community, and, consequently, is not available for this type of research and will permit desirable modification of software and hardware, and, in particular, interfaces.

SCOLDS (*Cont. from pg. 1*)

and check-out procedures before the run begins, and reports repeated errors during the experiment. The system displays histograms of gross counts on either axis of an array, deviation from a line fit on any axis of an array, or a contour of counts on the face of the chamber, allowing the physicist to monitor the progress of his experiment. The improvement in efficiency makes maximum advantage of often limited accelerator time.

SCOLDS' modular design allows a user to add new software modules for his specific information requirements. SCOLDS can control experiments and provide as much information during experiments as available memory will permit.

SCOLDS can be used with any PDP-15 or PDP-9 with a minimum configuration of 8,192 words of core memory, an oscilloscope, two magnetic tape transports, and a tape control.

DEC's PDP-15 is an 18-bit, medium-scale computer designed for use in research and engineering. It is available in four system configurations ranging in price from $16,500 to $91,000.

For more information on SCOLDS for the PDP-15, check customer service box #4.

Accelerate NMR Research

The **National Research Council's** Applied Chemistry Division recently purchased a computer-based data acquisition and analysis system from **Digital Systems Associates, Ltd.** (DSA) of Ottawa, Canada for Nuclear Magnetic Resonance (NMR) research.

According to a DSA spokesman, with the PDP-8/L computer, NMR researchers can finally apply a low cost small computer to on-line data acquisition in the study of nuclear magnetic moments.

The DSA system is designed to do weighted signal averaging. This allows averaging without overflowing memory, at variable sample rates from 1 microsecond per sample to only a few samples per second. Using this technique, the chemist can average phenomena data obtained at very fast to very slow rates on the same system.

This wide sampling capability is due to the special hardware designed and built by DSA in consultation with Dr. Garg of NRC who is presently using this system for wide line NMR, EPR, and Pulsed NMR.

Special software was designed to analyze data acquired on Varian Associates wide line NMR spectrometer. This software includes programs to perform: integration; second moment calculation; and simulation of gausian and lorentzian curves to compare the line shape.

The system is also being used to acquire data from Pulsed NMR (spin echo) spectrometers, where decays as fast as 4 or 5 microseconds can be sampled and then analyzed by fast Fourier transforms.

Researcher Dr. Garg in the Applied Chemistry Department at the National Research Council in Ottawa uses this Digital Systems Associates, Ltd. PDP-8/L based system for studies of nuclear magnetic resonance. The resonance chamber where rf. and magnetic fields act against the sample is seen at the right. (See Photo right)

West Coast Training Center Opens

DEC has opened a West Coast Training Center in Palo Alto, Calif. to service customers who would prefer attending PDP-8 Family training courses in California rather than Maynard. After the West Coast Training Center is firmly established, DEC expects to add a number of other training courses to the initial schedule.

Currently offered are PDP-8 Family Courses in: Basic Programming; PDP-8 Family Programming (paper tape); PDP-8 Family Programming (DECtape/Disk); PDP-8/I Hardware Familiarization; and PDP-8/L Hardware Familiarization. Computer hardware is available at Palo Alto for training courses.

Basic Programming

October 20
December 1
January 5
March 9
April 27
June 1

PDP-8 Family Programming (DECtape/Disc)

September 22
November 3
December 15
January 19
February 16
March 23
April 20
June 8

PDP-8 Family Programming (Paper Tape)

October 13
November 27
December 8
January 12
February 9
March 16
April 13
May 18

PDP-8/I Maintenance

October 6
November 10
January 26
February 23
March 30
May 4
June 15

PDP-8/L Maintenance

September 29
November 17
February 2
March 2
April 6
May 11
June 22

Persons interested in enrolling in training courses at the West Coast Training Center should contact Digital Equipment Corporation, 560 San Antonio Road, Palo Alto, California 94306, Tel: (415) 328-0400. Course information is also available from the DEC Training Department at Maynard. Tel: (617) 897-5111 Ext. 2564.

300 DEC Computers in Canada

DEC has installed its 300th computer in Canada — a PDP-8/I purchased by **Digital Systems Associates Ltd.** (DSA) of Ottawa for use in their Data Centre.

DSA specializes in the design and building of digital computer based systems for scientific, industrial, and business applications. They are expanding their operation to include software development and batch processing services. While these customer services are the primary function for the PDP-8/I, the computer will also be used for tape conversion (paper tape to magnetic tape and vice versa), software development for the Data Center, control of peripherals, and development of customer oriented user programs.

DSA is currently developing programs for their Data Centre to appeal to the small businessman. One such program being developed for general accounting use covers one entire accounting cycle. It provides users with as much or as little information about the status of his accounts as he wants — when he wants it. It will be able to deliver up-to-date information on the status of any one account, or alternately summarize the entire financial position of the company at a given point in time.

Typeset-8 Exhibited

at G.E.C. '69

At the 1969 International Show and Congress of Printing, Publishing, and Paper Industries (G.E.C.) held October 4-12 in Milan, Italy, an expanded version of the **TYPESET-8** typesetting system was demonstrated. The **PDP-8/I** based system at G.E.C. '69 included 4K of core memory, two DECtape magnetic tape units, and a disk.

Present in the DEC booth was Marv Cothran, typesetting marketing manager, who noted, *"We impressed a lot of people with TYPESET-8's ease of operation. Two 110 characters-per-second photoelectric readers continually fed unjustified and unhyphenated tape into the computer which then produced totally formatted, hyphenated, and justified tape on two BRPE punches."*

Using the system's DECtape storage facility, programs for several types of photo composition and hot metal linecasting equipment were run, demonstrating TYPESET-8's acceptance of a wide range of input/output devices.

Rikei Trading Company Limited, DEC's Japanese agent, showed a PDP-8/I in its LAB-8 signal averager configuration to visitors at their recent Electronics Show held at the U. S. Trade Center in Tokyo on September 8-12. A working demonstration is still something new in Japan, and there is a tremendous amount of interest in computers over there at the present time.

Histogram Software for LAB-8 Available

A **histogram** software package for the LAB-8 signal averager is now available according to Frank Ollie, LAB-8 product manager.
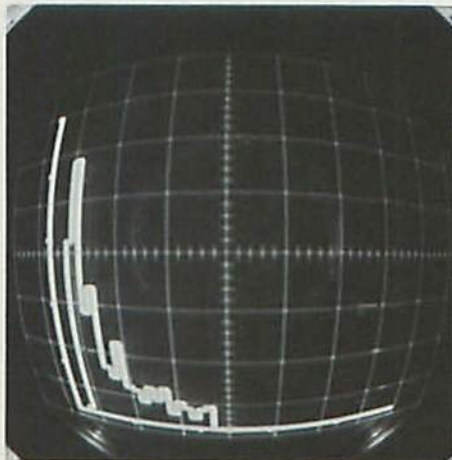
The package contains two programs, one for time interval histograms and another for latency histograms. Both programs are free to users of the LAB-8 and can be obtained through any of DEC's worldwide sales offices. They are expected to have application in such areas as psychology, biology and physiology.

Ollie pointed out that the programs are written so that a variety of histograms can be configured. They consist of four

On the LAB-8 oscilloscope, a typical second order integral histogram is shown in bar form. Histograms are particularly useful in Neurophysiology and other life science disciplines.

sections: pulse initialization, parameter set up, data collection, and output. All reside in an area of computer memory not used in data collection and analysis.

During data collection, the programs permit users to change the histogram order; stop data collection and return to the parameter portion of the program; halt data collection and retain the information in the histogram; or transfer to output mode. In output mode, they can do such things as scale the histogram up or down by a power of two; return to the original histogram at any order, at any time; plot or selectively type out the data; and expand the data between the moveable cursors to fill the screen of the oscilloscope that is part of the LAB-8 system.

Signal averaging enforces the signal to noise ration of repetitive signals buried in noise. The signal is scanned repeatedly by the computer, and the results stored in the memory. Random effects of interference are nullified, and a picture of the true signal built up. In addition to the signal averaging software and the histogram programs, routines for nuclear magnetic resonance spectrometry acquisition and analysis are also available. More than 100 LAB-8 systems are currently in use around the world. The latest LAB-8 system is a compact version that includes a PDP-8/L, a special analog-to-digital laboratory peripheral, paper tape reader and punch and Teletype, and sells for $15,750.

For more information on LAB-8 Histogram Software, check customer service box #5.

Environmental Control Studies

In Auto Pollution

PDP-8/L computers are being used as central processors in **Applied Dynamics'** analog/hybrid systems to determine the pollution effects of automotive exhaust gases. These K-400 Data Acquisition/Reduction Systems, designed specifically for efficient, economical, and accurate on-line exhaust emission monitoring, provide a reliable means of implementing the requirements of the Federal Government's 1970 air pollution test standards for new motor vehicles.

Two of the PDP-8/L based systems have been installed at the **National Air Pollution Control Administration's** Motor Vehicle Control Program Center at Willow Run Airport in Ypsilanti, Michigan. A third system is also in use at the Motor Vehicle Control Program's Field Laboratory in Los Angeles, California.

Accepting data from two sample train stations on an alternating basis, the system conditions gas analyzer input signals from the test vehicles, linearizes and integrates the data over variable time periods using both analog and digital circuitry.

The PDP-8/L takes this data and performs arithmetical functions and formatting to provide a print-out in accordance with the specifications in the 1970 Federal Standards. The system allows selection of any one of eight different pollution tests with a maximum of 16 cycles and 16 modes per cycle. In addition, the system is readily expandable for future test requirements.

Rolls Royce, Ltd., recently became the second British auto maker to incorporate a small general purpose computer in an automated system for analyzing exhaust gases from autos being exported to the United States. Earlier, **Standard Triumph Motors** began using a similar system.

The Rolls Royce system includes a **PDP-8/S** computer linked via a device designed and built by the company's Electronic Department at Crewe, England, to a special analyzer. The system is programmed to monitor exhaust gas concentrations produced in various driving conditions, such as idle, accelerating, cruising, and braking. The basic test determines the hydrocarbon and carbon monoxide concentrations for an "average trip" of about 17 minutes in a metropolitan area, from a cold start.

The test facility at Crewe was built to enable Rolls Royce autos to be checked for compliance with American standards for air pollution control in motor vehicles. The PDP-8/S monitors the gas concentrations from each analyzer at the rate of 10 samples a second, determines average values for each mode, performs the necessary calculations and prints out the results, stage by stage, during the test.

Standard Triumph's system was built by Systems Computors and Grubb Parsons, both members of the Reyrolle Parsons Group, and incorporates a PDP-8/L computer. The PDP-8/L is approximately the same size as the PDP-8/S, but makes extensive use of integrated circuitry.

And Smog Detection

Ten remote pollution-control terminals have been installed throughout New York City by the **Department of Air Resources** to continuously monitor and transmit on-line data on air pollutants and meteorological variables. As reported in a recent issue of *COMPUTERWORLD** the terminals are part of the first system in the country designed specifically to monitor smog levels.

In operation almost a year, the pollutant-monitoring system samples six major variables contributing to polluted air. Data is collected at remote sites by an Auto-Met III controller that is manufactured by the **Geotech** division of **Teledyne Inc.**

Samples of sulphur dioxide, carbon monoxide, smoke, and weather information, such as wind direction, wind speed, and temperature are transmitted from the remote sites by Telemetry over phone lines to a master controller. In addition to the ten on-line sampling sites, pollutants are sampled automatically at 28 other stations strategically located throughout the city. These samples are taken to the laboratory for analysis and provide back-up information.

A DEC **PDP-8/S** is the central processor for the system. The computer operates as a data scaler comparing the incoming data with previously established curves to provide output levels, measuring the pollution content present in the air in parts per million. This level is then used by the city to compile its daily air pollution index.

According to Dr. Edward F. Ferrand, director of the Bureau of Technical Services, information received on the pollutants provides the basis for a daily air pollution index. It is also used to institute procedures for New York's Alert-Warning System and, as Dr. Ferrand noted, "The network is used in accurately determining the severity of air pollution episodes."

The Auto-Met III units used in the New York system were specially designed by the environmental sciences group of Geotech to perform in a pollution control environment.

According to Larry Beman, project development engineer at Geotech, the monitoring system is the first of its kind to operate in the U.S. Initial interest in the system has been high and several cities are planning to duplicate the New York City effort in monitoring air pollution.
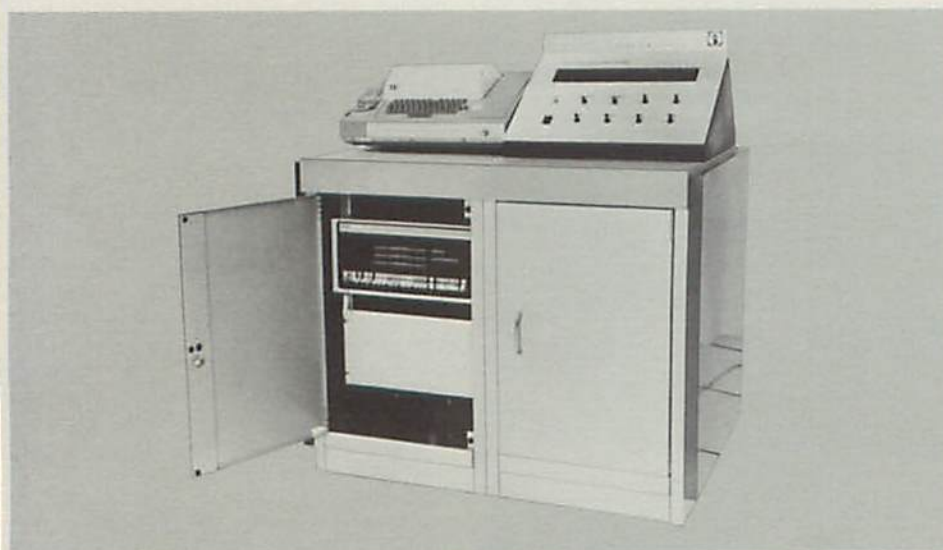
Accurate on-line exhaust emission monitoring is provided by the Applied Dynamics' K-400 Data Acquisition/Reduction Systems. Incorporating a PDP-8/L computer, the three systems currently being used by the National Air Pollution Control Administration provide a reliable means of implementing the requirements of the Federal Government's 1970 air pollution test standards for new motor vehicles.
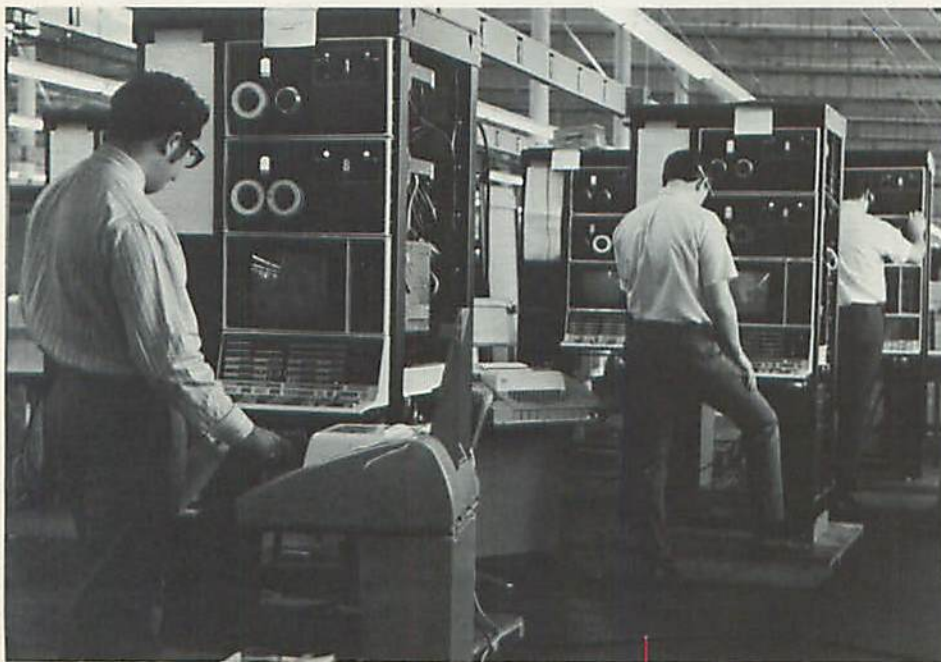
DEC technicians perform final production checkouts on several PDP-12 computers soon to be shipped to customers. First deliveries of the system took place last June. Since then, more than 75 of the new general-purpose computers with a built-in CRT display have been delivered in the United States, Canada, Great Britain, Sweden, and Germany.

DEC Installs First Lab System In Europe

The first European installation of DEC's computer-based system for recording and interpreting data from clinical analyzers was completed recently at **Royal Berks Hospital** in England.

The system, for blood sample analysis, was supplied by the company's European subsidiary with offices in the same city. It includes a LINC-8 laboratory computer and a variety of software packages. The software, developed at the University of Wisconsin, is known as **LABCOM**. In this application, the system is interfaced to multi-channel SMA 12/60, SMA 12/30, and SMA4 analyzers. A number of single-channel units will be connected later.

Since the speed of the LINC-8 is very high compared to typical sampling times, each multi-channel analyzer is treated as a single-channel input device. This permits expansion up to 288 channels (assuming 12-channel analyzers) through the 24 LINC inputs. While the system is being used in blood sample analysis exclusively, it could be used for other types of clinical analyses, electrophoresis, for example.

To supplement its high sampling capacity, the computer is programmed for a series of automatic test routines and statistical analyses. Data is displayed on a CRT display, and it is also available as a printout for a permanent test record. The printout is a compilation of statistical information on the number of tests performed, average values, and standard deviations. Histograms giving the monthly range of distribution of selected constituents are provided, as well.

The LINC-8 computer in the system is a 12-bit machine with 4,096 words of core memory, teletypewriter, paper tape reader and punch, analog-to-digital converter, oscilloscope, and dual magnetic tape unit. It can be easily installed in the laboratory, and because of the simplicity of its English-based computer language, training is kept to a minimum, and the technician's understanding of the system is enhanced. DEC also offers the **Clinical Lab-12** system using its newer PDP-12 laboratory computer, which further adds to system versatility.

New Hampshire High School Receives Classroom Computer

Some 350 of the 500 students at **White Mountains Regional High School** in Whitefield, N.H. were introduced to a new teaching aid when school opened last month — a small computer designed to help them reduce the number of longhand calculations they have to do in class.

The computer, a PDP-8/S, will be used as a teaching aid by the school's mathematics and science departments.

"We plan to integrate the computer with courses we already offer," said Thomas Ford, chairman of the school's science department. *"For instance, the computer can plot periodic functions in a physics class while the students spend their time preparing to use the information. Before we had the computer, students plotted all the functions longhand, taking valuable classtime and increasing the homework burden.*

The degree to which the students actually will handle the computer depends on the level of difficulty of their course material," Ford said. *"The lower grades will participate in classroom demonstrations, but our Advanced Topics, Advanced Math, and Calculus classes will work individually with the computer as soon as they can,"* he said.

Ford noted that the computer is not a substitute for learning mathematical operations; it relieves the student from the tedium and chance for error in repeated calculations. *"It lets the student who has demonstrated that he can calculate longhand spend more of his time studying mathematical relationships."*

The cost of the computer was offset by an education grant and National Defense Education Act funds from the New Hampshire Department of Education. The funds left a balance of only $125, which will be offset by a fund-raising project this year.

White Mountains Regional High School serves five towns in northern New Hampshire. The school's science department and the mathematics department, headed by James Swenson, will share in the application of the computer.

Ocean Mapping System Nears Completion

The Navy Oceanographic Office at Suitland, Md., is completing development work on a new computerized system for charting the world's oceans. Scheduled for completion shortly, it will employ four classes of ships and two types of DEC computers that will replace manual data gathering and chart preparation.

Five large, diesel-powered and two steam-powered research ships and a variety of smaller sounding boats will be used in the new system. All will be equipped with computers. The larger vessels will have a dual computer system made up of two **PDP-9** medium-scale machines. The smaller boats each will have a **PDP-8/L** on board. A total of 27 computers will be employed to collect data and produce hydrographic maps.

The Navy's Military Sea Transportation Service will operate the ships for the system. A spokesman for the office pointed out that the system will be used on a continuing basis to develop new charts and update existing ones. The office has responsibility for all waters outside the United States and its possessions. The charts are primarily for the Navy and American maritime interests.

Using manual methods, charts from data gathered on a four-month survey have taken as long as three years to prepare. All computers in the new system are equipped with plotters so that charts can be prepared almost as the data for them is acquired. The computers can sample data at the rate of 2,000 samples a second. Both the mother ships and the sounding boats will gather data. The PDP-8/L's on the sounding boats will store it on magnetic tape. The tapes will be processed by the larger computers on the mother ships.

The dual PDP-9's can gather and process data simultaneously. One computer can gather data, and the second can analyze it. Also, this system permits data to be stored for later analysis, off-line. The system will gather information on the sea floor, on the tides, currents and meteorological elements.

Office officials predict that besides improved charts, the new system will generate information that will be useful in planning harbor improvements, seaplane anchorages, and in silting, erosion and earth science studies.

Cambridge Firm Offers Special Medical Time-Sharing

Hospitals, clinics, and laboratories needing the services of a computer and wanting to avoid the expense of owning a system may find some solutions to their problems through programs developed by a new biomedical time-sharing firm in Cambridge, Mass.

The newly formed company, **Medical Information Technology, Inc.**, will initially offer programs for automating patient interviewing, clinical laboratory reporting, and hospital census reporting.

According to Morton Ruderman, president of the new firm and former biomedical marketing manager for DEC — the leading supplier of small computers for biomedical applications, other programs are under development that will be used for patient care and information retrieval, pharmacy inventory, and dietary planning.

Joining Ruderman in the new firm are Neil Pappalardo, vice president and treasurer, formerly a computer engineer with MIT, the Peter Bent Brigham Hospital, and the Mass. General Hospital; Curt Marble, systems manager, formerly of the Mass General; and Professor Edward Roberts, consultant, of MIT's Sloan School of Business.

Institutions using the company's services will be able to lease one or more terminals on a monthly basis. Terminals to the company's large **PDP-9** computer system will include keyboard displays and Teletypes. Analog/digital converters will be added to terminals used to monitor laboratory instruments. The company has ordered a number of **PDP-15** computers to add to the firm's hardware. The PDP-15 is DEC's new medium-scale computer, the successor to the PDP-9.

"The three major types of programs we currently offer," Ruderman said, *"are easily adaptable to the needs of our clients. A typical biomedical customer has his own way of doing things, and we want to ensure that the computer does not upset his routine.*

We have also designed our system so that you don't have to be a computer-oriented person to operate it," Ruderman continued. *"A major part of our service is instructing the user so that he can easily operate the equipment. In addition, we show the client how he can adapt his system to handle new or changing tasks."*

Medical Information Technology's patient interviewing program is an excellent device for an institution that has to screen large numbers of patients before examinations, Ruderman indicated. It is an automated version of the usual procedure followed by physicians interviewing patients.

Another program can be used to keep track of the number of beds available in a hospital, where they are located, and the name of the patient occupying each bed as well as the patient's illness. The program makes instant information available to admissions departments and doctors who wish to locate a specific patient or the patient's medical history.

A third type of program can be used to keep records of and do calculations on the output of laboratory instruments doing blood and other types of analyses.

"Despite the thousands of computers now in use in hospitals," Ruderman says, *"we are just beginning to find out how many uses the computer may have. We hope to be able to extend those frontiers."*

Additional information can be obtained directly from Medical Information Technology, Inc., 65 Rogers Street, Cambridge, Mass. 02142. Tel: (617) 354-3000.

Morton Ruderman, president of Medical Information Technology, Inc., samples patient interviewing program.