

ONLINE

MARCH
1969

DIGITAL EQUIPMENT CORPORATION

Industrial Control PDP-14 Opens New Horizons

With the recently introduced PDP-14, Digital has begun a revolution in automated mass-production that could prove as significant as the revolution begun in small-computer technology with the PDP-1.

The latest addition to our product lines is an industrial production-control machine designed for processes now controlled by relays. It can control any mass-production line whether that line oozes toothpaste, bottles milk, or assembles autos.

"I would classify it as an 'atypical computer'," said Project Manager John Holzer. "It's a computer architecturally in that it has a central processing unit, memory, and input-output devices. It is atypical in that it cannot perform mathematical computation."

"We, Digital Equipment Corporation, created and invented the small-computer market, by marketing, designing and selling the PDP-1, PDP-8, et cetera," said Vice-President Stan Olsen under whose aegis the PDP-14 will fall. "Digital opened a whole new market for the small computer and that's what we hope to do with the PDP-14."

The PDP-14 will do anything that current relay banks can, and more, but it will also do the same things more reliably, more flexibly, and less expensively.

The PDP-14 will save manufacturers money two ways other than reducing 'down time'. First, it will cost less. Secondly, its greater flexibility will allow manufacturers to change the PDP-14's memory to allow it to control

a completely different machine.

Once a relay bank has completed the production control for which it was specifically designed, it is discarded. The PDP-14 can control different production with different programs.

"Some machines controlled by relays are 'down' 10 percent of the time because of the relays," said John. "This can represent millions of dollars lost to a manufacturer. The PDP-14 can reduce that 'down time' by a factor of 10."

"Any process that is done the same way day after day," is John Holzer's description of potential applications. With such a market, it's easy to understand Stan Olsen's enthusiastic predictions for this "atypical computer".



Good Day, Mr. Penguin

Recently, the U. S. Embassy in Canberra telephoned our Sydney office to report that the U. S. Coastguard vessel GLACIER required a service call on a PDP-8/S used for calculating the ship's position from satellite signals. The only drawback was that the GLACIER was stationed at the Antarctic base at McMurdo Sound!

Pausing only to grab a pair of woolen socks, Field Service Engineer Stuart Morrison flew 1,000 miles to Christchurch, New Zealand, and then another 2,000 miles by Navy plane to the polar base.

From there a helicopter took him to the GLACIER, where the trouble was quickly located and fixed.



Computerized Typesetting Makes Happy Birthday, Says Marvie:

Dear Marvie:
For last year's birthday, my son asked for a newspaper. We got one at a bargain. This year he wants a computerized typesetting system and another linecasting machine. Which would you suggest? We don't want to spoil him.

John P. Flipton, Sr.

Dear JP:
The PDP-8 typesetting system. It's less expensive, will make his linecasting machines more efficient, and he won't get his hands dirty on it.

Dear Marvie:
My girlfriend's father has finally talked me into coming down to see his computerized typesetting system knock out a display page. I've heard that takes 2½ hours, and I'm afraid I'll get bored. What do you suggest I bring along to keep busy?

Restive

Dear Restive:
Bring along a cigarette. It'll take 7 minutes.

Dear Marvie:
Over the next two years we're planning to gradually convert from hot metal to photocomp. Will the PDP-8 typesetting system go along with the change?

Far Sighted

Dear Far Sighted:
It will. And if you ever change your mind, it'll go back to hot metal in 5 seconds.

Marvie will be glad to help you with your problems. Send them on a postcard, or if more personal, in a letter, to Marvie, Digital Equipment Corporation, Maynard, Mass. If they're urgent, call (617) 897-5111.



digital
COMPUTERS • MODULES

DEC EYE-CATCHERS would be one description of these imaginative

advertisements devised by Gabe D'Annunzio's Advertising Dept.

Promotions and Appointments

Ralph Wilk has been appointed Administrator, College Recruiting and Relations, Personnel Department. He will be responsible for our nationwide college and university recruiting effort.

During the 1968-69 recruiting season, Digital recruiters visited about 40 schools and interviewed over 600 applicants.

Ralph received his bachelor's degree in economics from Earlham College and his MBA in industrial relations from Cornell University. He joined Digital in September 1968.

Steve Sobel has joined Digital as a staff analyst working directly for President Ken Olsen. Steve came to Digital from the Mitre Corp., Bedford, Mass. where he worked on a project testing the ability of a satellite to support communications requirements of various military commands. He holds bachelor's and master's degrees in electrical engineering from M.I.T. and a master's in business administration from Harvard.

Cliff Stanley has joined the Personnel Department. He will participate in Digital's professional staffing efforts and will also assist in several Professional Personnel areas, including personnel research and surveys. Cliff was most recently associated with High Voltage Engineering, Burlington, Massachusetts where his duties included the development of employee compensation and job evaluation programs and employment practices. Previously, he worked in Personnel at M.I.T.'s Lincoln Labs, Lexington, Massachusetts. He is a graduate of the University of Connecticut.

Hartley La Duke has been named supervisor for the PDP-10 software development group. Dave Plummer, who had been PDP-10 software supervisor, is now working on technical projects under direct supervision of Programming Dept. Manager, Larry Portner. Before joining Digital, Hartley was a senior programmer-analyst for Control Data Corp., Minneapolis. Hartley graduated Magna Cum Laude from the State University of New York.



Ralph Wilk



Steve Sobel



Cliff Stanley



Employment Passes 3,000

Total employment for Digital Equipment Corporation and its subsidiaries has passed 3,000.

Ten years ago there were less than 75 employees and five years ago total employment was under 1,000. Approximately 600 new employees were added during 1968.

In Maynard, total employment now exceeds 2,200, an increase of over 400 from January 1968. There are over 200 employees in Canada, and the rapidly-growing San German facility now has a work force of over 100.



Cosmopolitan Computer

DEC's products are being put to use in many corners of the world at an increasing rate. The following are some recent interesting installations.

IN NORWAY

The Christiania Spigerverk Iron and Steel works in Oslo, Norway, is using a PDP-8/S to log data from a steel-melting arc furnace, to obtain information for optimal melting conditions.

The computer is also supplying the furnace crew with important parameters that are calculated from measurements taken from the furnace.

Christiania Spigerverk also plans to use the PDP-8/S computer to control the furnace directly, on-line, next year.

IN ENGLAND

Spectrographic analyses of high-alloy steels and heat resistant alloys are obtained more speedily at Sheepbridge Alloy Castings Limited, Sutton-in-Ashfield, England, with the aid of a PDP-8/S.

The computer is interfaced to an Applied Research Laboratory's direct-reading spectrograph. Prior to this arrangement, the spectrum data had to be looked up by hand in tables, and many of the findings then had to be computed with a desk calculator. The computer not only performs the operations much more rapidly than was possible before, but also reduces the chances of human error.

IN AUSTRALIA

Signals obtained from the analysis of organic fluid samples at Alfred Hospital, Melbourne, Australia, are being processed on a PDP-8/S. Significant time savings have resulted from the use of this computerized system, believed to be the first of its type in Australia.

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Drafting Speeds Ideas to Reality



George Bourbeau monitors the automatic plotter driven by the PDP-6 behind it.

Converting design concepts to concrete descriptions of how to build products is entrusted to the Drafting Department. This Department is the liaison between concept and reality.

Eighty-six men and women provide this vital service to Digital, a company competing in an industry where success requires continuous innovation. As do so many other departments, Drafting relies on Digital's own computers to help it operate more rapidly and accurately.

Wirelist Group

Drafting's Wirelist Group produces wiring lists for our equipment and punched cards or paper tape to operate production wiring equipment.

This group receives engineering sketches or formal logic schematics, extracts the wiring information, and punches it onto punch cards. It reads the cards into the group's PDP-4, which transfers the data to magnetic tape, and prints a wirelist.

The wirelist is corrected on the PDP-4 and processed further on the PDP-6. The list is then converted into punched paper tape for semi-automatic wiring or a deck of control cards for automatic wiring.

Automated Drafting

One of the company's most widely-known yet least-understood services is Drafting's Automated Drafting Sec-

tion. Under George Bourbeau, this section employs a PDP-4 and a PDP-6 to translate ideas in specifications.

The Automated Drafting System converts sketches into drawings, module usage lists, module parts lists and wirelists. This group receives sketches of DEC equipment circuitry, and codes it into language describing the sketch's graphics, wiring and module information. The code is teletyped into the PDP-6 and processed with the Automated Drafting programs. The PDP-6 drives an automatic plotter that draws the diagrams.

The wirelist is then converted into control cards or papertape for automated wiring. The new process requires fifteen hours per drawing, half the time required under the previous PDP-4 manual method.

Bob Kingsbury supervises the design/drafting of new and special product

design, which composes the bulk of the department's work.

New and Special Design

The unifying aspect of the electro-mechanical drafting function is presenting ideas and information in graphic form. The variety of drawings produced and knowledge needed by the draftsmen to produce these drawings are tremendous. The common denominator in the various drafting jobs is the skilled draftsman. At the top of the drafting category is the senior draftsman or designer who contributes to the design itself, not merely to the expression of the design in graphic form. The checker ensures that the characteristics of the design are being reflected accurately in the graphic representations. The anchor man of the department, the detail draftsman, prepares the final detail drawings which will be released to manufacturing. These may include parts drawings, assembly or system drawings. He is an expert in depicting and dimensioning.

Information, Please

Ron Senatore, Supervisor of Information Services, and his staff control security, updating, records, and distribution of 80,000 engineering documents. The section comprises Engineering Change Order, Document Control and Print Distribution. These groups respond quickly to requests for engineering and production data by engineers, draftsmen and personnel in other departments. continued on p. 4



Ron Senatore (left) and Bob Kingsbury examine drawing done by one of Bob's men.

Cosmopolitan Computer

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The samples, such as blood plasma, are investigated in a 12-channel clinical analyzer in the hospital's biochemistry department. The print out from the PDP-8/S gives the constituents of the sample being analyzed.

Prior to the introduction of the computer, it was necessary to read clinical charts manually to obtain the necessary information. The time saved automating the process frees laboratory personnel for other duties.

IN FRANCE

Close to the site of the 1968 Winter Olympics, the secrets of matter are being investigated by the French Atomic Energy Commissariat with the help of a PDP-8/S. Connected to a device known as a single-crystal polarized neutron diffractometer, the computer controls the angles through which a specimen under investigation is mounted, and aids in data acquisition.

Neutron diffraction can tell a physicist or chemist many details concerning the structure of a crystalline sample he is investigating. Before installation of the computer, this work had to be done in a semi-automatic fashion with the controls of the diffractometer being manipulated by hand.



Drafting

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The design/drafting operation is continually undergoing change to meet the demands of Digital's engineers who keep developing new ideas. The use of computers within the process will be extended to other nondimensional and dimensional drawings. The task of shortening the lead time of graphics information from concept to the building of the product is the immediate and long range goal of the Drafting Department.



News Notes From Here and There



DEC PRODUCTS ARE SHIPPED AROUND THE WORLD from Boston's Logan Airport's International Air

Paris speech

Charlie Spector, Analytical Lab Marketing, will represent Digital at "EEE" Magazine's annual technical seminar. The seminar, to be held in Paris, will be attended by engineers and scientists from the U.S. and several European countries. Charlie, who helps market Digital's NMR-8, GLC-8 and PHA-8 laboratory systems will talk on "Small Computers in Instrumentation".

PDP-8/S in Britain

The pioneers of real time computer systems in Europe, England's International Data Highways, Ltd., has installed a PDP-8/S in its London training center. IDH uses the PDP-8/S to give students, whom it hires straight from school, "hands-on" experience with a computer. The company also employs the PDP-8/S in demonstrations, computer simulations, and running mathematical models.

PDP-9 Peripherals

Two PDP-9 peripherals were recently announced, a medium-speed card-reader and control, and a low-cost disk storage and control unit.

Freight, Inc. warehouse. Last month, five PDP-10's were shipped to Europe and Canada.

The card reader's capacity is 200 cards per minute; this device can be used with the PDP-8 Family also. The disk storage unit is designed for the PDP-9 Family only.

Timesharing Article

An article by Nick Pappas and Tom Elliott, Programming Dept., has appeared in "CYBERNETICS 70", a magazine published by the Yale University Daily News. The article, "Timesharing", traces the development of timesharing and discusses its concepts and uses. "CYBERNETICS 70" is the latest in an annual series, each covering a different industry, compiled by the staff of Yale Daily News and distributed nationally.

GLC-8 In Canada

DuPont of Canada, Ltd. has selected the GLC-8 for on-line analysis of data from gas chromatographs. The GLC-8 computer system is built around the PDP-8/I; chromatographs are used in quality control testing on the full range of chemicals and synthetic fibers manufactured at the facility, as well as in general research and development.



Active In Local Theatre Groups

Employees Answer Curtain Call

"We have an off-Broadway theatre group," said Jim Pitts, president of the People's Theatre of Cambridge, "about 200 miles off Broadway."

He spoke facetiously, but several Digital employees devote spare time to local theatre groups. One drama enthusiast is Glenn Prinkey, Programming Department.

Glenn manages the Framingham Community Players' workshop. The workshop's responsibility includes introducing new members to the Players and producing the group's skits and one-act plays.

The Players stage four productions annually, two childrens' plays, and two adults'. This month, they are performing "Barefoot in the Park", a comedy of contemporary urban America. This play earned rave reviews nationwide, and ran for more than two years on Broadway.

Glenn performed in a local church-sponsored production of "Arsenic and Old Lace", a murder spoof involving two old maids and their poisonous elderberry wine.

The Framingham Community Players number about 40 people in the active membership.

Each June, the Players participate in the New England Theatre Competition for amateur groups.

Another theatre group participating in the New England Theatre Competition and represented at Digital is the Little Theatre Workshop of Acton. Mary Zimmer, Module Marketing, has performed varied tasks for this group. Actress, costume director, and make-up artist are some roles she has filled.

"Musicals are my favorite plays," said Mary. "I especially enjoyed performing in "Oklahoma". Although I love acting, I feel that I do a better job behind the scenes."

The Little Theatre Workshop's next performance will be staged with the Acton Community Center. The two organizations will produce "Can-Can" April 25, 26, 27 and May 1, 2, 3, at the Acton Community Center. "Can-Can" will mark the first time that a professional director has been hired.

At least three employees, Jim Pitts, PDP-9 Marketing; Gus Chikwendu, Programming; and Pete Hawtrey, PDP-9 Marketing, work with the Peoples' Theatre of Cambridge.

The theatre accepts people regardless of experience. If someone needs training and practice, he can obtain them from the theatre's "seasoned amateurs" and professionals.

"In the last five years, we've produced everything from Shakespeare to LeRoï Jones," said Jim. His group approaches drama with a professionalism that belies its amateur status. Directors of their productions have included drama professors from Tufts and other local universities.

This professionalism is reflected in honors won by the theatre. Their performance of "Noah" in 1965 captured the Moss Hart Memorial Award for the best production at the New England Theatre Conference. In 1966-67, the theatre was the only amateur theatrical organization invited to Boston's Winterfest, a festival of the performing arts held in the Prudential Center.

Pete Hawtrey designs and supervises construction of much of the theatre's lighting equipment, including the lighting board for "The Hostage".

Gus Chikwendu completes the trio of Digital employees involved with the Theatre. Like most others who become involved in community theatres, he shifts from speciality to speciality within the theatrical group. He has done everything from acting to sound production.



PDP-10 TIMESHARING -- Field Service's Bob Lowe checks out a PDP-10's

timesharing before shipment to a customer.

MARCH ANNIVERSARIES

10 Years

Eva Anelons
Henry Crouse
Robert Dill
Broncia Smale

9 Years

Muriel Thompson

8 Years

Theodore Kauppi
Charlotte Reynolds

7 Years

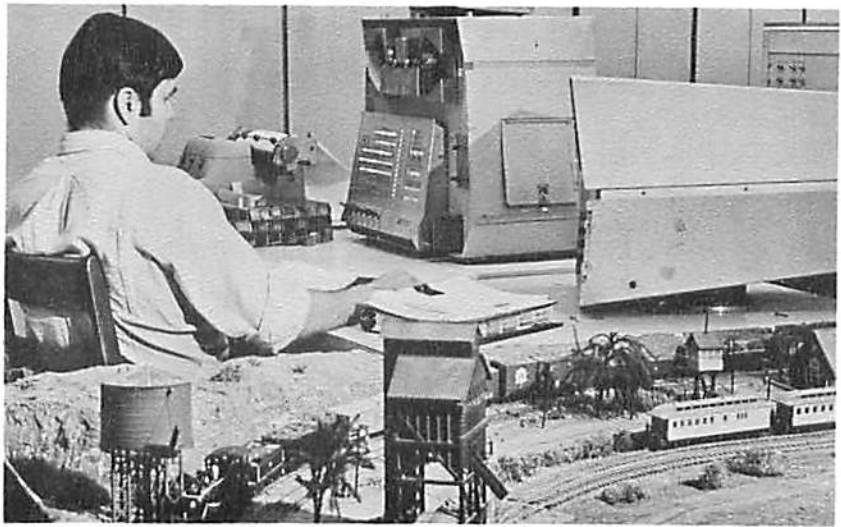
Violet Alves
Robert Brackett
Lee Curren
James DiMauro
Doris Kearney
Ronald Lafosse
John O'Connell
Marv Wilson

6 Years

Richard Allen
Roy Bernier
Marie Brackett
Denzil Doyle
Ann Flagg
Dennis McCaffrey
Mort Ruderman
Ken Senior
Eileen Siniski

5 Years

James Carroll
Robert Carroll
Manford Doucette
Juergen Kesper
Dorothy Lewis
Thomas Norton
James Pitts
William Segal
Terry Wilkins
John Woodman



COMPUTERIZED MODEL RAILROAD—
A University of Massachusetts student

operates the PDP-1 that will control
this railroad.

PDP-1 Controls Model Train

The day is fast approaching when even model railroading will be automated. Instructors and graduate students at the University of Massachusetts are developing a project that will place an elaborate HO gauge model train layout under the control of a computer.

"Passenger" and "freight" trains traverse the landscaped board between miniature train stations, railroad yards, and a lumber mill. The computer will locate these trains, route them to desired locations, change cars and record train locations, simple tasks by human standards but highly complex ones for a computer.

This task has been assigned to a computer to teach process control to students of the University's Computer Sciences Department. This is one of the most rapidly growing areas for the general purpose digital computer. In charge of the project is Dr. J.A.N. Lee, the head of the department.

"While the PDP-1 is 10 years old," Lee said, "age is no problem, since its design is so advanced. It is more like a computer four or five years old."

Just setting the railroad up so it can be controlled by the computer should give students plenty of practice in process control, Lee believes. "Already, I can see about 10 masters'

theses: Such things as routing the trains by the visual display; deciding what type of sensors should be installed on the trains and how should they be installed; how to select and distribute the railroad cars; how to prepare a way list, and the development of a coding scheme for the various railroad cars. As we get into the project, other ideas will present themselves."

"Four or five of my graduate students came to me after learning the department was getting its own computer and said that they wanted to learn something about process control," Dr. Lee recalled. "The problem was finding some process to control."

"Then," Lee continued, "I learned that a friend in Canada was going from HO gauge trains to models of a larger size. He let me have his layout for the cost of shipping it to our Amherst campus."

While controlling the model railroad might be the most unusual task the department's PDP-1 will perform, it is by no means the computer's only job. It is an integral part of the program offered by the department, the first such in New England and one of only 37 in the United States.



DEC's Local Contributions

Local high school students, hospitals, libraries and various community agencies will benefit from Digital's 1969 contributions program.

Annually, Digital allocates a sum of money to be used for community or charity purposes. There are so many deserving organizations that depend on public support that the perennial problem for digital is to decide "how much?" and "who?"

"We receive all sorts of requests for donations from all over the country," states Dimitri Dimancesco, Chairman of the Contributions Committee. "For fairness and consistency, we recommended that the contributions be made in the areas in which the majority of Digital's employees reside."

Topping the list of contributions was the Maynard Community Chest which is the major fund raising organization in Maynard for the local Boy Scout and Girl Scout organizations, the Salvation Army, the Concord Red Cross and the various Concord Community Agencies.

Another large contribution was made to Emerson Hospital, Concord, which serves many DEC employees and their families. The money will be used toward the cost of a new room in a new wing of the hospital.

The scholarships will be awarded to graduating seniors in ten local high schools.

SUMMARY OF CONTRIBUTIONS

Maynard Community Chest

Raises funds for Salvation Army, Boy Scouts, Girl Scouts, Assabet Little League, Concord Family Services, Emerson Hospital, Walden Guidance Clinic, Middlesex Assn. for Retarded Children.

Hospitals

Emerson Hospital, Marlboro Hospital, Lowell Hospital, Framingham Union Hospital

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"PUERTO RICO, HERE WE COME," says Frank Kalwell. Digital chartered this DC-4 plane to transport to

Puerto Rico during the recent dock-workers' strike.

Neither Rain, Nor Wind, Nor . . .

Late at night, on a lonely runway, by the glare of an automobile's headlights, a vintage '45 C-46 plane was loaded with tons of freight. At 3 a.m. it rumbled off into the darkness on a long journey.

It sounds like an episode from Mission Impossible. Actually it was another chapter in the "goods must go through from Maynard to San German" saga.

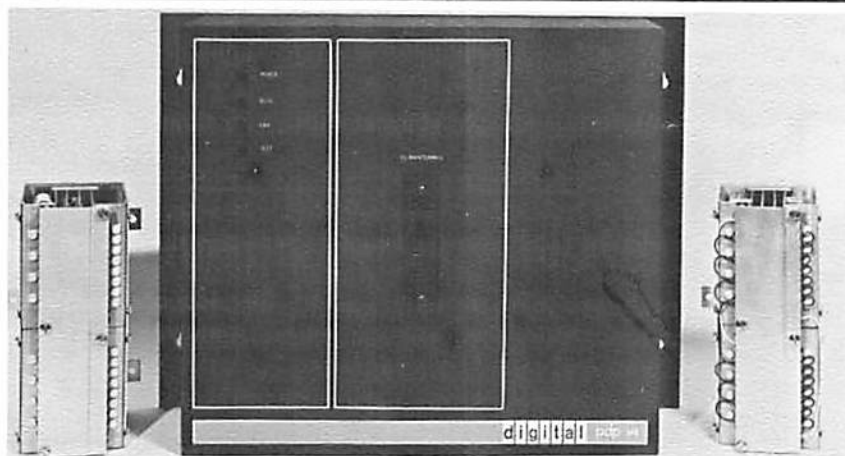
Faced with a dock workers' strike and an embargo on freight by regularly scheduled airlines, DEC Traffic Manager Frank Kalwell and Traffic Supervisor Ray Michel chartered the C-46 and arranged for it to be loaded at Worcester Airport, which does not normally handle freight.

shut down for the flight and the loading. The midnight loading resulted when the plane arrived several hours overdue.

Ralph Morse, Module Supply Room attendant, flew to San Juan with a 12,000 pound shipment consisting mostly of material for expansion of the San German module plant.

Another charter flight was later arranged by Frank Kalwell from Fort Lauderdale to San Juan with freight carried by truck from Maynard to Florida. The DC-4 aircraft carried 16,000 pounds into San Juan Airport where the cargo was loaded into a 40-foot trailer for shipment to the San German plant 100 miles away.

One of the airport's two runways was



THIS PRELIMINARY DESIGN MOCK-UP OF THE PD P-14 shows why

Digital's latest product is referred to as the "little black box."

Old Footballs Sell Computers

A new product advertising series, featuring unusual graphics and bold headline slogans, is helping introduce DEC's products to potential customers.

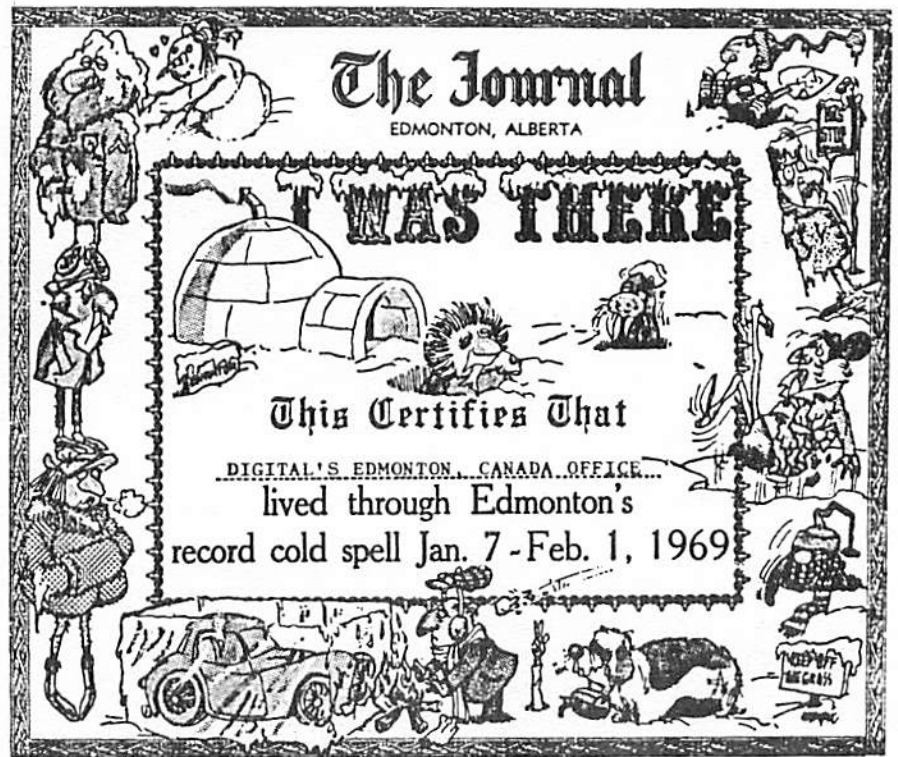
The ads are divided into several distinct campaigns, each with its own format and theme. Bold graphics and prominent use of the company's distinctive logotype are the threads common to all the ads.

In magazines serving the publishing industry, a beaming Marv Cothran, DEC's Typesetting Marketing Manager, appears beneath a headline proclaiming "Cool coffee goes better with Computerized Typesetting." The copy consists of several "Dear Marvie" letters.

A PDP-9 ad aimed at the biomedical market announces: "When the Waves Attack, PDP-9 'em." Another ad directed at educators shows a badly worn out football with a caption, "Classroom computers for those who are a little short."

How do pictures of footballs, blackboard erasers, and marketing managers help sell computer systems? They arrest the eye and entice the reader. Once his interest has been aroused, he is likely to read the copy.

This month, two new ad campaigns directed at technical management in science and industry will debut in "Fortune" and "Scientific American" magazines.



We Thought Maynard Was Cold!

Digital's Maynard employees thought that they were enduring severe winter until this cartoon arrived from our Edmonton, Canada office. During the

26-day period listed above, the HIGH temperature was -6. That's what we call earning a certificate the hard way!

Daily Temperatures at Edmonton Industrial Airport.

	H	L		H	L		H	L
Jan. 7	-6	-14	Jan. 17	-10	-16	Jan. 27	-22	-27
Jan. 8	-11	-21	Jan. 18	-13	-22	Jan. 28	-20	-31
Jan. 9	-18	-25	Jan. 19	-16	-22	Jan. 29	-23	-31
Jan. 10	-16	-23	Jan. 20	-16	-31	Jan. 30	-22	-39
Jan. 11	-14	-24	Jan. 21	-15	-31	Jan. 31	-11	-30
Jan. 12	-18	-26	Jan. 22	-16	-35	Feb. 1	-10	-20
Jan. 13	-10	-24	Jan. 23	-13	-30			
Jan. 14	-11	-18	Jan. 24	-6	-31			
Jan. 15	-13	-20	Jan. 25	-16	-31			
Jan. 16	-12	-25	Jan. 26	-12	-25			

DEC's Local Contributions

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Libraries

Maynard, Acton, Marlboro, Hudson, Leominster, Stow.

In addition, Digital also donates many thousands of dollars worth of computers and equipment to various organizations, particularly schools.

Scholarships

Maynard High School, Marlboro High, Marlboro Vocational, Acton/Boxboro Regional High, Hudson High, Hudson Catholic, Nashoba Regional High, Leominster High, Littleton High, Lowell High.

