

Process Engineering: Interface Between Engineering and Manufacturing



Digital's new Northeast Regional Headquarters and Waltham District Office.

New Waltham Office is Two-in-One

Digital's new offices in Waltham house both the Northeast Regional Headquarters and the Waltham District Office.

The Northeast Region, managed by Roger Handy, is responsible for sales throughout New England and Upstate New York. In addition to the new Waltham facility, District offices are located in Rochester, New York; Meriden, Connecticut; and Cambridge. From Waltham each District is supported most economically by a regional team that includes field service engineers, under Kenneth Kinchla, and software specialists under the direction of Leo Shpiz.

In keeping with DEC's philosophy of locating field offices close to the largest concentration of business, the Waltham District Office is now able to provide quicker sales and service response to its many customers in the area. District Manager Ron Eisenhower states that Route 128 offers ready access to all major routes to Western Massachusetts, Rhode Island, Maine, New Hampshire, and Vermont.

The new office, located at 15 Lunda Street, has 6,300 square feet of floor space and a staff of more than fifty. Of
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The Process Engineering Department serves as an interface between Digital's engineers and manufacturing people.

Tom Stockebrand and his group are practical. Experienced engineers and technicians, they know how to tie Digital's manufacturing capabilities to its manufacturing capabilities, satisfy everyone, and get the job done.

"Trouble-shooting" is one of their duties. As their name implies, the group deals with processes — all sorts of processes, from electrical and mechanical to programming. The five engineers and nine technicians (including two associate engineers) try to perceive at what point a process may run into trouble BEFORE they are asked to do so. Working closely with equipment and circuit designers, Tom's group can't risk overlooking any aspect of a process. They must live with it from design to implementation. By that time, they've foreseen and eradicated probable trouble spots.

The tasks handled by Process Engineering are roughly divided into one-third wet process control and two-thirds building new production machinery.

Wet Process Engineering involves operations such as silver and gold plating and the soldering of printed circuits. The production machinery under construction runs from small machines such as wire strippers and cutters and insertion gadgetry to the tooling of a die set. The group also works with large machinery, such as automatic wire-wrappers, the automatic insertion of parts into modules, the linking together of automatic machines, and large-scale machines for data processing.

In existence for more than two years, Process Engineering cuts across two fields: chemistry and electronics. The group accepts nothing at face value, but is pessimistic until convinced otherwise. Members include Dave Berglund, Dick Burton, Ron Cajolet, Dave Estabrooks, Jack Grieve, Fred Haefner, Jim Kalagher, John Labate, John McCarthy, Dick Reynolds, Dave Saari, Tom Stockebrand, Jim Whitney, and Dave Widder.

Recent projects the group has worked on include facilities additions to the Model Shop, automatic handlers for IC testing in Incoming Inspection, high speed board slitting to replace separation dies in Module Assembly, a high speed paper punch installation for the Program Library, hot-cold testing equipment for Purchasing, an automatic degreaser for Canada, a computer numerically controlled punch press in a job shop, a new automatic wire tester for the Canadian semiautomatic wirewrap installation and a computer controlled automatic insertion machine installation for Module Assembly. The last three projects are part of an overall plan to conduct manufacturing procedures and obtain machine-readable documentation.

Just the Thing for His Christmas Stocking!!!

Digital is offering a 40% discount from the list price of a Computer Lab to employees who wish to increase their working knowledge of computer logic. Effective immediately DEC employees can purchase a Computer Lab for \$267 instead of the list price of \$445.

The Computer Lab is being used in high school math classes, in vocational technical schools for training in electronics and computer technology, in community colleges, in electrical engineering programs in universities, and in training engineers and technicians in industry.

The offer is limited to the purchase of one unit at a discount during any one-year period. DEC employees outside the United States would be governed by prevailing exchange rates and import duties.

Mechanical Engineering's Challenge: Synthesize Efficiency and Beauty

When Loren Prentice came to Digital in 1959, he was THE Mechanical Engineer. Now he heads a department of 17 people, including 7 mechanical engineers, 4 mechanical technicians, 2 industrial designers, 3 model makers, and a secretary.

Since his department is concerned mostly with packaging design, it must fight the double-headed monster of practicality and pleasing appearance. Nowadays, it is not enough for a computer to be purely functional — it must also be aesthetically pleasing.

Loren's career in computer packaging began with the PDP-1 and progressed through most of DEC's subsequent computers. He and his engineering and drafting staff are ready to help anyone in Marketing or Engineering with advice concerning the mechanical design of a new computer.



Jack Carroll, industrial designer, enters data into a system using a VT04 terminal,

An example of the kind of engineering help that Loren's Group provides is the way it solved a real "hot" problem. Heat dissipation is a constant problem in packaging design. Since the circuits in a computer emit a considerable amount of heat, a method must be found to prevent heat buildup in certain areas and the consequent melting of panels or short-circuiting of wiring. Mechanical Engineering has solved this by installing flushing fans at the top of the cabinet and smaller fans at critical areas within the computer, always keeping the air in constant motion from the top to the bottom of the equipment.

The aesthetic aspect of the job is handled by Loren's industrial designers. When the technical specifications for a job have been set, the designers make a rendering of the proposed equipment for presenta-



Dick Bernier, a mechanical technician, works on the layout for the packaging for a computer.

while the screen reflects his input.

tion to the Operations Committee; if a go-ahead is given, the model makers construct a mockup of wood or pasteboard.

The industrial designers also help Digital put its best foot forward by designing show booths for conferences and exhibits, taking into account two factors: what Digital wants to convey to the public and how to make the displays attractive.

The challenges that are constantly being met by the members of Loren's department are those of designing products that are well-styled, emphasize the man-computer function, are of high quality and reliability, can be manufactured in quantity, and at minimum cost. They must synthesize efficiency and beauty... and that's no small task!

Who Said That?

If you should happen by the PDP-12 Engineering Lab on the fifth floor of Building 5 in Maynard, don't be alarmed if you're greeted by a deep and rasping: "Hello, I'm a PDP-12."

The "green machine" has just about everything else and now it's getting a voice. It has made some progress, but still has considerable improvements to make in enunciation.

The PDP-12's voice tutor is Programmer Jack Burness, who simply registered his voice on magnetic tape, using an A/D converter to digitize the sound signals. When this was done, he entered the signals into the computer's memory. Then he played them back on a speaker, which is standard equipment on the PDP-12 (the speaker was designed into the system to help engineers diagnose problems by enabling them to listen to the sound patterns).

The voice, somewhat eerie as it emanates from the computer, sounds like someone with a bad case of laryngitis, but the words are intelligible. Jack hopes that a little more tinkering will result in clearer sounds.

Programming Keeps Softball Crown

In a bench-squirring playoff early in September, Programming repeated last year's performance, beating Production Control in the DEC softball finals, two games to one.

With a 12 and 0 record, Production Control came on strong in the first game of the best 2-out-of-3 finals, winning easily by a score of 10 to 4. However, Programming's well coordinated defense in the next two games stopped Production Control's offensive cold and Programming went on to win those last two games with scores of 11 to 4 and 6 to 3.

Approximately 250 DEC employees took part in the League, which has just completed its fourth season. Umpiring was provided by professional ASA umpires. According to Paul Dimauro, League President, most of last year's players returned and 80 new players were added.

Reading Special Systems Group Helps Test "Concorde"

Although the first two prototypes of the British-French supersonic transport, the "Concorde," have been successfully flight-tested, John Kirk of Digital's Reading Computer Special Systems Group is not resting on his laurels.

John is Project Engineer for DEC's multi-processor systems, which use a PDP-10 and several PDP-8/I's to control the testing apparatus for the "Concorde." At present, John is directing the design and manufacture of the special PDP-8/I equipment from Reading, and will later work with the Maynard Group for checkout of the PDP-10 equipment. Then, he will move to the subcontractor installation sites in Farnborough, Hants, England to complete the project.

With more than 1,000 of Digital's computers now installed in Europe, the Computer Special Systems Group, with its

dedicated engineering and technical support capability, has gone a long way to establish Digital as a truly international Company.

Established as a separate group early in 1968, Reading Computer Special Systems is managed by Bev Hallman. The group includes eight engineers and a secretary, who work out of a building used for PDP-8/I and PDP-8/L production; however, plans call for the expansion of their area by the spring of 1970 to cope with increasing business. The staff will also be expanded at that time.

Additional group members include Carole Gittings, Secretary; Bob McPherson, Applications Engineer; Val Kassassinoff, Bernard Shuster, and John Kirk, Project Engineers; John Saunders, Draftsman; Jeff Coles, Technician; and Cliff Kirby, Wireman.



The Reading, U.K., Computer Special Systems staff includes (l. to r.) John

Saunders, Carole Gittings, Cliff Kirby, and Jeff Coles.



Additional staff members are (seated) Bev Hallman, Manager, and (standing, l. to r.)

Val Kassassinoff, John Kirk, Bernard Shuster, and Bob McPherson.



Digits "A" (l. to r.) Mike Molloy, Bob Phillips, Ken Parker, Carol Barnett, John Barnett, and Rick Jacobs.

Reading Produces Formidable Bowlers

By Val Baillie
Reading Public Relations

For members of Digital's Reading staff, Friday night is bowling night, when it's "all down to the Excel Bowl for sessions on the 10-pin lanes." Two teams, Digits "A" and Digits "B", are drawn from both offices and plant, and enthusiasm is high.

Digits "A," led by Rick Jacobs of Field Service, is the more experienced side, for this is now their second season, and scores of 160 are the order of the day. Digits "B," led by Jeff Coles, Special Systems Engineer, is at the start of their first season and, according to veteran players, are showing real promise.

Both teams play in the Thames "Riverside League," where opposition is stiff. In their first match of the season the "A" team met the winners of the Winter League, "The Kamakazi Kids," and although beaten, put up a really good fight to take a game.

Supporters are always welcome, so if you're in Reading on a Friday night, looking for life — the Excel Bowl is where it's at!

Digits "B" (l. to r.) Chris Groves, Pete Watson, Nan Head, Jeff Coles, and Peter Dormer.



Milk, Cookies, and Programming

On the afternoon of Friday, October 3, Charles Hornig obtained a visitor's badge at Digital-Maynard and spent the afternoon writing machine-language programs on-line using a PDP-8/I Time-Sharing System and a stand-alone paper tape system. As programmers came and went, they raised an eyebrow or two...because, you see, Charlie is only 12 years old!

Charlie, however, just kept plugging away at the Teletype keyboard, writing and checking his programs, now and then stopping to plan his next move, and then pecking away at the keys again in his own two-fingered fashion.

Charlie was introduced to computers a year ago October when, while in the sixth grade at the Franklin School in Lexington, Mass., he was one of fourteen sixth graders selected to attend a class in Computer Programming using FOCAL®, organized and taught by Miss Lyn McLane, Elementary Mathematics Specialist for Lexington Schools. Mr. Walter Koetke, who is in charge of computers at Lexington High School, made the high school's TSS-8 Time-Sharing System available to the class.

Devouring the class material with ease, Charlie became so intrigued with the computer that he asked Miss McLane to get him a personal copy of Digital's *Introduction to Programming*, from which he taught himself to program in machine language.

Having obtained permission from Mr. Koetke to use the TSS/8 during summer vacation, Charlie became a permanent fixture in the computer room and, after two months, was "thinking" in octal.

Charlie's parents, Dr. and Mrs. Arthur Hornig, a physicist and a former programmer, respectively, encouraged him in every way after he had shown interest in computers, but could provide no assistance because neither is familiar with small computers or machine language.

Charlie is quiet and unassuming. He seems to accept the computer as a tool as we would expect most children his age to accept the typewriter. When not busy on the computer, Charlie enjoys football, baseball, Boy Scouts, and most other activities common to children his own age.



Promotions and Appointments



Benson

John Benson is Digital's new District Sales Manager for Connecticut, after serving as Acting Manager since former Manager Dick Hill was transferred to another region. John joined the Connecticut district a year ago as an applications engineer. He has had considerable sales experience with Hewlett-Packard (instrumentation and computers) and Clevite (peripheral products).

Page Four

Thomas A. Nezwek has joined Digital as a Production Manager for computer assembly. He had been serving as a production control supervisor with Lear Siegler, Inc., Grand Rapids, Michigan and has worked with Ford Motor Co. as a manufacturing engineer. Tom worked his way through college as a tool and die maker, receiving a B.S. in Mechanical and Industrial Engineering from the University of Michigan and an M.B.A. from Western Michigan University.



Nezwek



Toolan

Terry Toolan has been named Engineering Support Manager for Digital's U.K. Field Service organization. He will be responsible for product line support for future installations, and also for some 450 DEC computers that are already in commission. Terry joined Digital 18 months ago and has been serving as PDP-8 Group Leader for the U.K. Previously, he had spent 11 years with Associated Electrical Industries in Manchester, England.

“Any Child Can Assemble It in Two Hours”

Everyone needs a bit of relaxation occasionally.

If you passed a small room near the Sales Training area on 5-3 during October, you might have thought that Digital was providing therapy for harassed engineers and technicians. There were several apparently sane men assembling two large cranes from Erector sets.

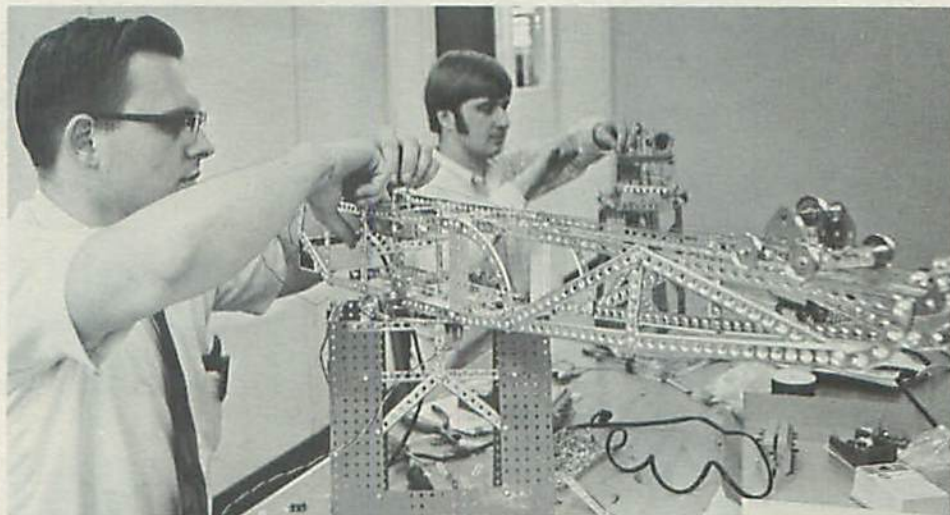
Now and then, one would fumble for the instruction book and mumble something about, “This darned boom doesn’t fit right!” or “Who’s got the magnet?” It didn’t seem to be the fun that the Gilbert Company claimed it should be!

It all began when Digital decided to exhibit the PDP-14’s capability in fixed-sequence control systems at the Instrument Society of America’s meeting in Houston... But, how to demonstrate it??

Al Devault, Manager of Control Products; Stan Znamierowski, a mechanical engineer in PDP-14 Engineering; and Don Chace, PDP-14 Engineering Manager, thought that it would be a great idea to show how the PDP-14 could control a crane.

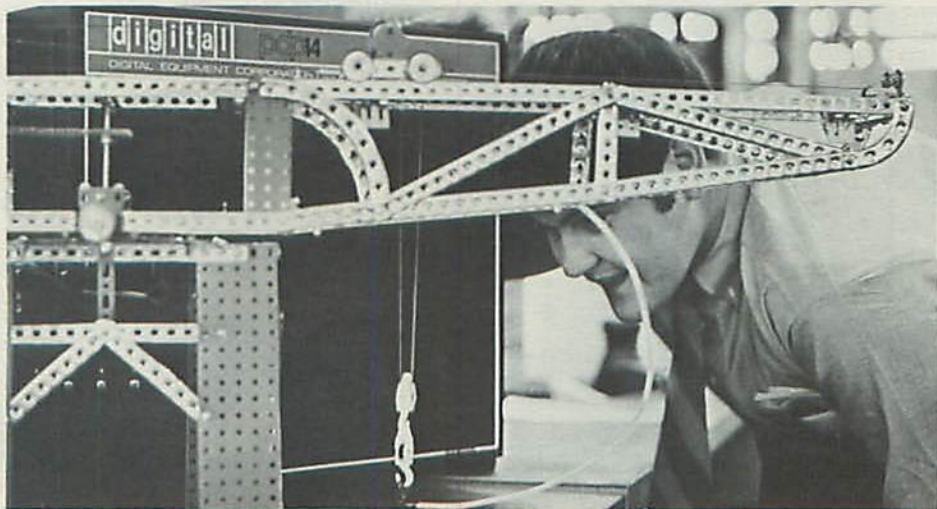
It was, of course, difficult to obtain a REAL crane, so the Gilbert Company, a division of Gabriel Industries, was asked to donate two of its crane kits, which it gladly did. When completed, each crane was 3 feet long by 16 inches high. However, the completion wasn’t exactly child’s play, even for experienced engineers.

The cranes proved a great success at the meeting, despite all the mental and physical anguish that had gone into their construction. Which all goes to prove... don’t send a man to do a boy’s work!!



Al Ricketts, PDP-14 Design Engineer, and Rich Michalak, technician, used their re-

serve of technical know-how to assemble the cranes.

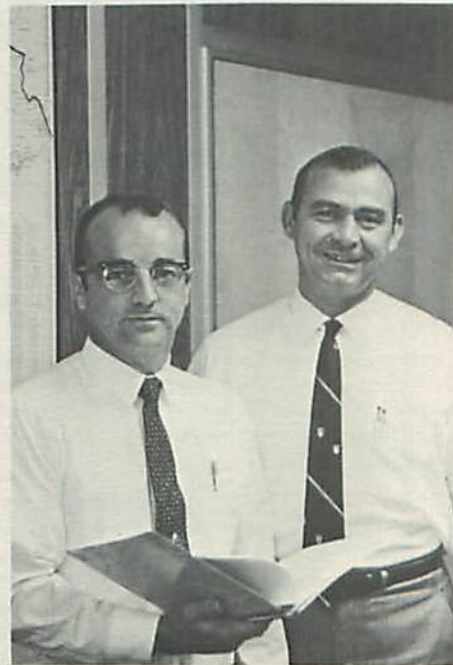


Larry Fahey, senior technician on the “project,” watches the crane pick up nuts

and bolts with its electromagnet.

Waltham (Cont. from Page 1)

that number, 20 are in sales and software support, 27 are in field service, and 7 are in other support functions. The field service personnel report to Cliff Pitz, Waltham District Field Service Manager.



Northeast Regional Manager Roger Handy and Waltham District Sales Manager Ron Eisenhower appear pleased after looking over their sales record.



Cliff Pitz (l.), District Field Service Manager, and Frank Polucha, District Field Service Supervisor, check a module against the Logic Handbook.

ON LINE

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digital

Direct Mail — Our Silent Salesmen

Both in quality and quantity, the Direct Mail Department provides a valuable service, particularly to Digital's customers and salesmen.

"The Direct Mail Department sends out approximately 30,000 pieces of mail every month," remarked Al Gleeson, who is in charge of Direct Mail activities, "in addition to bulk shipments of literature to the field."

With his staff of 14, Al manages to keep on top of the mailings, as well as the Company's customer/prospect mailing list and master contact files. His group also stores promotional literature and manuals, and coordinates general corporate mailings and selective mailings for individual branch offices.

In addition, Direct Mail distributes and maintains sales and schematic notebooks; processes all reader, trade show, and direct inquiries for literature; and distributes literature in bulk to the sales force. Leads obtained from the inquiries Direct Mail receives are sent to field offices for follow-up.

Staff members of Direct Mail include Gertrude Loynd, Irv Shanley, Stacia Taylor, Gertrude Deforge, Gladys Gorts, Bob Hynes, Don Durant, Natalie Leghart, Linda Noseworthy, Pat Wetherall, Marlene Beers, Marie Young, and Theresa Banfield.

Gertrude Loynd has the overall responsibility for office procedures. She provides the field offices with pricing information, processes customer purchase orders, and handles most of the more complex areas involved with literature and mailing.

Irv Shanley, a recent addition to the department, has the overall responsibility for the master contact file and will eventually assume greater responsibilities for maintaining and handling the mailing lists.

Stacia Taylor and Gertrude Deforge process the more than 10,000 inquiries that arrive each month and supply the field offices with leads.

Gladys Gorts is the group leader for all mailing. Her duties also include assembling and updating all salesmen's and schematics notebooks. Bob Hynes and Don Durant are literature expeditors, who receive and store all new promotional literature, package and send shipments to field offices, and keep track of inventory.

There are, at present, five direct mail clerks: Natalie Leghart, Linda Noseworthy, Pat Wetherall, Marlene Beers, and Marie Young, whose job it is to affix the labels, put the material into envelopes, and run them through the meter. Theresa Banfield is in charge of all SBA's (Shipping Billing Authorizations) and the processing of all office correspondence.

Although the mailing is done by hand at present, Al has ordered a Cheshire Labelling Machine, which is capable of affixing about 7,000 computer-processed labels per hour. "It's the first step toward automating the Direct Mail Department," according to Al.

"Direct Mail exists to serve Digital, and is always ready and willing to give advice on mailing methods and mailing list maintenance," he concluded.



Al Gleeson, Direct Mail Administrator. The best way to see him is to set a bear trap in his office.



Marlene Beers operates the postage meter.



Don Durant packages literature orders for shipment to the field.



(L. to r.) Gladys Gorts processes sales notebook requests, while Theresa Banfield takes care of customer literature orders,

Stacia Taylor answers reader inquiries, and Gertrude Loynd, as usual, helps someone to solve a problem.

KV Graphic System Provides Instant Information

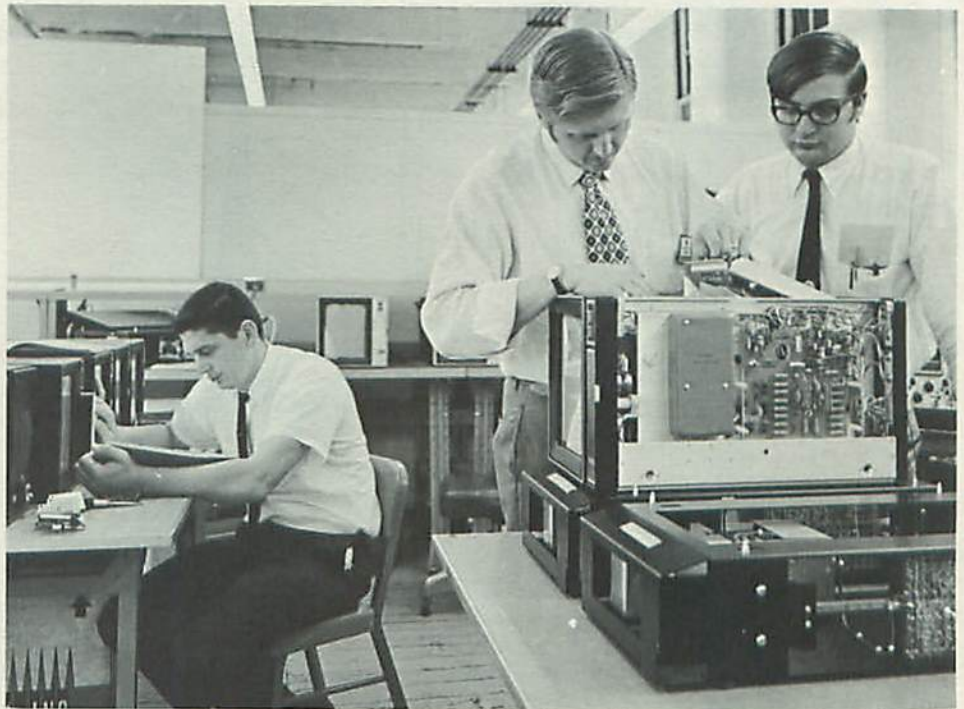
In these days of "instant" everything, the need for instant access to information is no exception in areas as diverse as school-rooms and airline ticket offices. DEC's latest answer to this need is the KV Graphic System.

Among the system's assets are its abilities to display alpha-numeric or graphical data, provide means for direct action, and work infinitely faster than a teletypewriter. The new KV Graphic System requires very little storage space in the computer and can be used either with a single scope (with the ASR33 Teleprinter as a keyboard) or with multiple individual display terminals, each having a keyboard and joystick. Using the joystick, the operator can point to locations on the screen, call for information, or enter graphical information into the system.

A software package called EDGRIN (Editor with GGraphic INTERpreter) is included with each KV Graphic System to help develop programs and to act as an editor/translator. Input is accepted from the keyboard, paper tape, or the joystick, and is stored in the computer's core memory to be retrieved on command.

In addition to wide usage in circuit design analysis and structural design, KV Graphic Systems are being used by physicians for quick access to patient information as well as for report generation.

A recent medical application involves charting a cross sectional area of a patient so that a plan for the X-ray treatment of cancer can be developed. Various X-ray beam arrangements can be tried, with the computer displaying the resulting X-ray accumulation as isotropic lines (similar to



Project Leader Paul Scriven (c.), Technician Al Deluca (l.), and Tom Pitman check

out the first multiterminal KV Graphic System.

topographical lines) on a graph. Since X-ray exposure to vital organs must be kept at a minimum, the system enables a technician to develop and test several alternative plans in a fraction of the time formerly required.

A large metals company is exploring a system that will provide instant pricing and simplify the production process. Salesmen will determine specifications for

parts required by customers and will draw the parts on the graphic display system at any one of the company's sales offices. When the data have been entered, the item will be priced and, with customer acceptance, the information will be transmitted directly to the production floor with the information needed for numerical control of the production equipment. The pilot operation has already been installed.

Additional applications for the KV Graphic System include monitoring a pharmaceutical freeze-drying plant, computer-aided instruction, traffic control for seaways and roads, and many more.

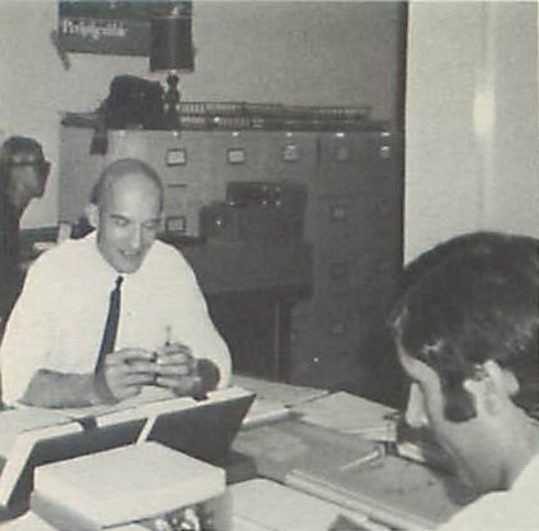
The KV Graphic System is the "brain-child" of the Display Products Group, headed by Bob Collings. The Project Engineer is Murray Ruben; Project Technicians are Paul Scriven and Al Deluca, aided by Tom Pitman, Technician, and Mike Kozak, Wireman. Cathi Smith is Group Secretary.



Display Product Manager Bob Collings (r.), Project Engineer Murray Ruben, and

Group Secretary Cathi Smith work on customer demonstration progress.





(L. to r.) Daniele Legrand, Jacques Denizot, field service TTY specialist, and Robert Lecarpentier.

'alho Paris



Robert Lecarpentier, field service module specialist.



Serge Viviens (l.), and Tony Adcock, field service engineers.



Claudine Delacourtie, formerly Senior Secretary for the Paris Office, and now in charge of the Purchasing Department.



Accountant Alexandre Phocas.

Where Do They All Come From??

Among the many reports that are produced by Digital's EDP Department is a roster of employees grouped according to the town in which they live.

While not the most important of EDP's reports, this list is one of the most fascinating.

Did you know, for example, that more than 50 Digital employees live in a town called Sabana Grande? Or that we have employees living in three different Abington's: Abington, Mass., Abington, Pa., and Abington, England.

The list also reveals that Digital employees reside in 14 countries and in 36 of the 50 states. Leading towns, as far as numbers of Digital employees are concerned, are:

Maynard, Mass.	576
Hudson, Mass.	225
Acton, Mass.	185
San German, P.R.	180
Leominster, Mass.	147
Marlboro, Mass.	133
Fort Devens, Mass.	118
Fitchburg, Mass.	86
Lowell, Mass.	86
Littleton, Mass.	85
Carleton Place, Ont.	82
Ayer, Mass.	82
Stow, Mass.	80
Sudbury, Mass.	79

Last, but not least, we have . . .
Toowoombo, Australia

1

Did You Know That...?

... Digital ranks second in Canada in number of computers installed. (IBM leads with approximately 1,069 installations).

... Over 300 DEC computers are now in use in Canada.

... Digital scored the biggest growth in Canada, with an installation increase of nearly 100% in the past year.

... One of the largest time-sharing systems in the world consists of a PDP-10/50 System at Dataline Systems, Inc., Toronto. This installation will support 120 simultaneous users and a potential of 300 subscribers.

... Digital now has 11 sales and service offices in Canada.