DOCUMENT RESUME

ED 112 275   CG 010 048

TITLE   Careers Canada. Volume 4, Electronic Data Processing
                Occupations.
INSTITUTION   Department of Manpower and Immigration, Ottawa
                (Ontario).
PUB DATE   75
NOTE   22p.; For related documents, see CG 010 045-047
AVAILABLE FROM Information Canada, Ottawa, K1A 0S9, Ontario, Canada
                (HC-$1.00)

EDRS PRICE   MF-$0.76 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS   Career Opportunities; *Data Processing; *Data
                Processing Occupations; *Electronic Data Processing;
                Government Publications; Occupational Clusters;
                *Occupational Information; *Office Occupations
IDENTIFIERS   *Canada

ABSTRACT
                This pamphlet, published by the Canadian Department
of Manpower and Immigration, is the fourth of a Careers-Canada series
and describes careers in electronic data processing. The pamphlet is
divided into eight major sections: (1) history and importance; (2)
where computer people work; (3) nature of work; (4) working
conditions; (5) advancement; (6) personal qualities needed on the
job; (7) preparation and training; and (8) future outlook. Several
photographs are included. (RWO)

CAREERS
CANADA

CONTENTS

3/4

MESSAGE FROM THE MINISTER

All Canadians must be given the opportunity to determine their abilities, develop them through education and training, and apply their talents in a meaningful occupation. To achieve this goal, sound information must be made available to every Canadian at a stage in their development where fruitful decisions can be made. Careers – Canada is a major effort towards this end.

The benefits of the Careers – Canada series should affect many people: the student considering entrance into the world of work; the worker seeking to change occupations; the prospective immigrant; the manpower or vocational guidance counsellor, in fact, anyone wishing to match people with jobs.

Many people have been involved in the production of Careers – Canada, I join them in wishing you every success in your career search.

Robert Andras

NOTE TO READERS

The ultimate judge of any material is the user. It is recognized that improvements can be made in the initial booklets and we ask all readers to forward any suggestions to us. The consolidation of these comments will allow us to better provide you with the type of information required.

Suggestions and comments should be addressed to:

Director,
Occupational and Career Analysis
and Development Branch,
Department of Manpower and Immigration,
305 Rideau Street,
OTTAWA, Ontario.
K1A 0J9

Ever since humans learned to count they have been trying to find easier, faster and more accurate methods of performing this routine task. The first aid to counting was the human hand but over the centuries we have slowly developed machines to keep track of our calculations. As technology advanced we began to create increasingly more compli- cated machines which required that buttons be pressed and levers be pulled to do calculations.

In the 1800's, two different people, Babbage and Jacquard, conceived the idea of using punch cards to control information. Babbage de- voted a lifetime trying to perfect ideas which form the mathematical and theoretical basis of today's electronic computers. Ada Augusta, daughter of the famous poet Lord Byron, worked closely with Babbage, and was, in a sense, the first "programmer". With more financial support and the technology of electronics they might have been able to perfect the world's first computer. More successful was Jacquard, a French mechanic, who invented a loom which used punch cards to automatically determine which threads would be selected for weaving. Using these cards, the loom could be "programmed" to weave patterns automatically into rugs.

Toward the end of the 1800's Dr. Herman Hollerith patented the Hollerith punch card. This and other equipment he designed were the basis for the formation of a manu- facturing company in 1911 which would eventually produce the first electronic computer.

It was not until 1944 that Jacquard's, Babbage's and Hollerith's ideas came to full realization with the construction of the first electro- mechanical computer. – The Mark I. This computer required some mov-
ing mechanical parts to perform its functions. However, in 1946 J. P. Eckert completed the first totally electronic computer – the only things moving in the computer were electronic impulses. This machine was called the "Electronic Numeri- cal Integrator and Computer" (ENIAC). Improvements came rapidly, and in the early 1950's these new machines were begin- ning to be used for business and research projects. Since then, tech- nological advances in computer design have been rapid, and the growth in their use by governments, sive.

Today, governments use com- puters for purposes as varied as tracking missiles and processing family allowance and welfare cheques. Universities use com- puters to process information rang- ing from scientific research to exam results. In hospitals, com- puters monitor surgical operations. City planners use computers to solve problems such as how to make traffic flow more efficiently and where to allow new industries to develop. The RCMP use com- puters to assist in solving crimes. Computers are used to set freight schedules for trains, process air- line tickets, solve engineering equa- tions, prepare payrolls, supply stock market reports, match people for dating bureaus, predict election results, process charge accounts, and to control equipment and indus- trial processes. The uses of com- puters now seem almost infinite, and in one way or another com- puters penetrate nearly every phase of human activity.
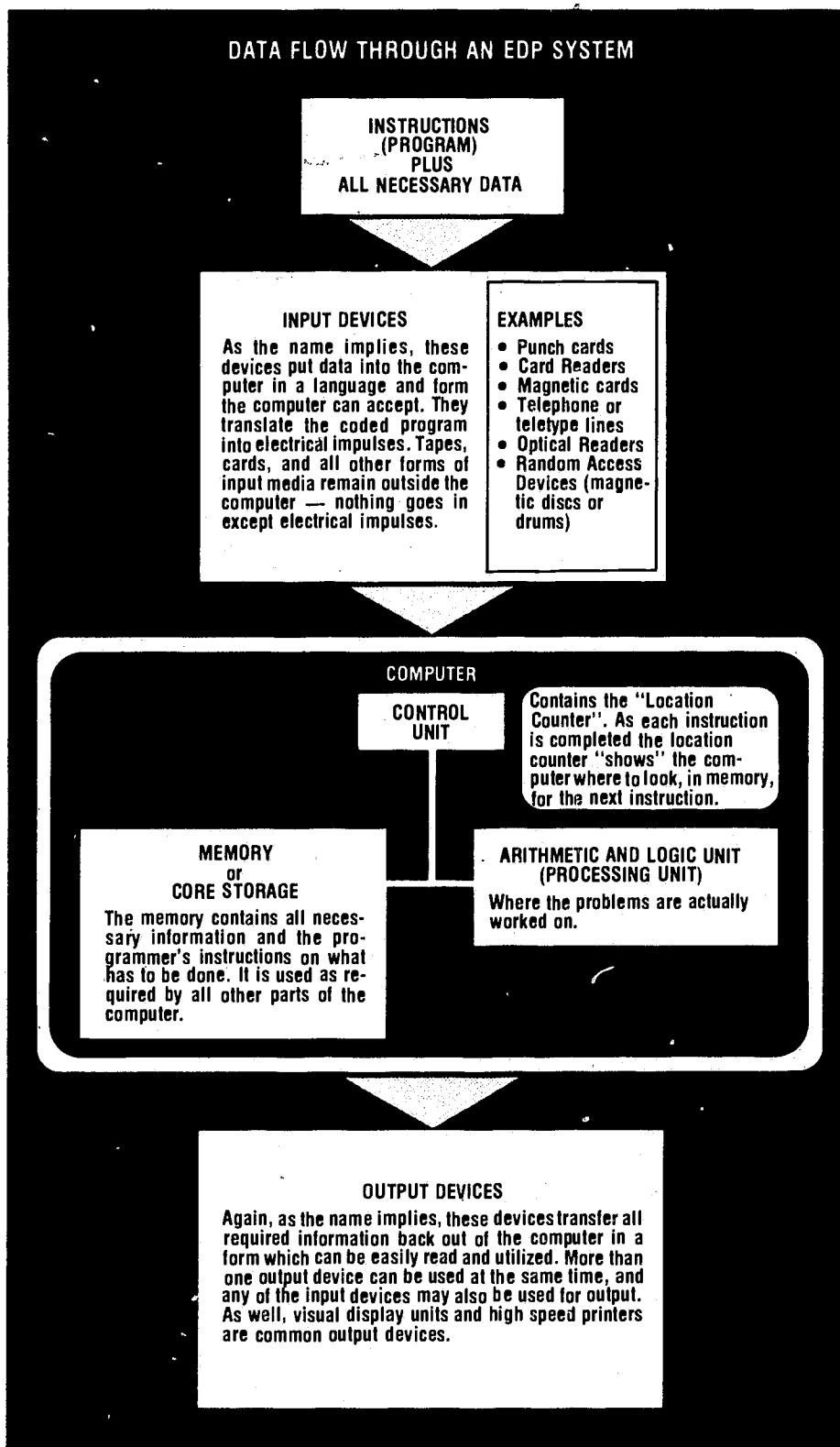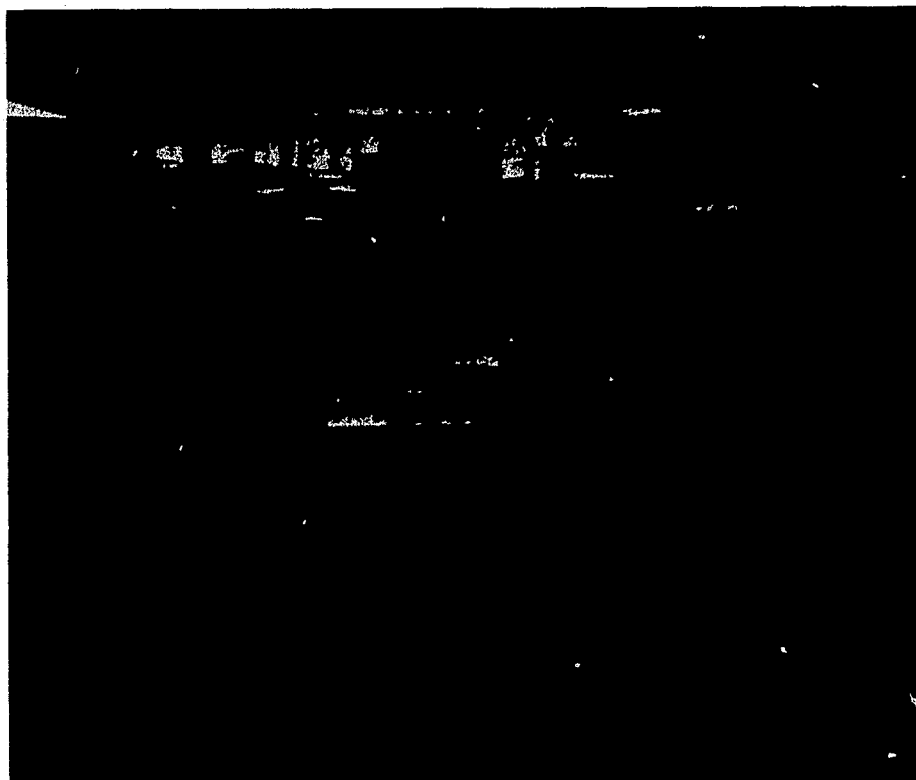
WHAT IS A COMPUTER –
HOW DOES IT WORK?

A computer is a device which can receive and store information, and manipulate it, extremely quickly, into a more readily usable form. Computers come in various sizes. Conventional computers are quite large and expensive which limits their use to large firms. Recently, more compact computers (known as mini computers) have been developed. These can be used by smaller firms where space and cost are a consideration. There are basically two kinds of computers – analog and digital. Each may function as a separate machine, or they can be combined into one computer called a hybrid computer.

Analog computers are used to keep track of monitor continuously changing physical conditions such as speed, temperature, pressure and properties of chemical reactions. They are "programmed" for specific functions when they are built and they cannot be instructed to perform additional or different functions. In the simplest sense, barometers, speedometers, altimeters, bathroom scales and thermometers are analog computers. A more sophisticated example would be a machine designed to monitor, graphically record and possibly display on a visual screen, the pulse rate, blood pressure, skin resistance, temperature and other bodily signs of a hospital patient.

Modern digital computers deal with information which is represented by letters, numbers or special symbols, and they are designed to solve problems or process data. They have three basic steps in their operation. Information or data must be fed into the computer. This phase is called input. At this stage, operators of *key punch machines, key tape machines, verifiers, remote computer terminals, sorting machines, card-tape-converters,* as well as *computer operators* and

DATA FLOW THROUGH AN EDP SYSTEM

**INSTRUCTIONS
(PROGRAM)
PLUS
ALL NECESSARY DATA**

INPUT DEVICES	EXAMPLES
As the name implies, these devices put data into the computer in a language and form the computer can accept. They translate the coded program into electrical impulses. Tapes, cards, and all other forms of input media remain outside the computer — nothing goes in except electrical impulses.	• Punch cards • Card Readers • Magnetic cards • Telephone or teletype lines • Optical Readers • Random Access Devices (magnetic discs or drums)

COMPUTER

CONTROL UNIT

Contains the "Location Counter". As each instruction is completed the location counter "shows" the computer where to look, in memory, for the next instruction.

MEMORY or CORE STORAGE

The memory contains all necessary information and the programmer's instructions on what has to be done. It is used as required by all other parts of the computer.

ARITHMETIC AND LOGIC UNIT (PROCESSING UNIT)

Where the problems are actually worked on.

OUTPUT DEVICES

Again, as the name implies, these devices transfer all required information back out of the computer in a form which can be easily read and utilized. More than one output device can be used at the same time, and any of the input devices may also be used for output. As well, visual display units and high speed printers are common output devices.

programmers, all become involved as members of the electronic data processing team. The information must then be re-arranged and solved in an orderly way – this is referred to as processing. It is the responsibility of the computer operator to control the computer and monitor its progress during this step. Finally, the information or solution must be fed back to the inquirer in an understandable form – this stage is called output. Here we will find high speed printer operators, and possibly one or more of the operators listed in the input step – since several of the input devices may also serve to output data from the computer.

Even computers which are designed and programmed for a special purpose, such as airline reservation or charge account processing systems, constantly require a person to give them very explicit instructions, and to ensure that all of the information the computer will require is available. These instructions may be anything from a request for confirmation of an airline reservation by a ticket clerk, to a more detailed set of specific instructions called a program, which is written by a programmer. By means of various input devices, the program is translated into a form which the computer can accept. Output devices translate the product of the computer's efforts back into a format which people can easily read and understand.
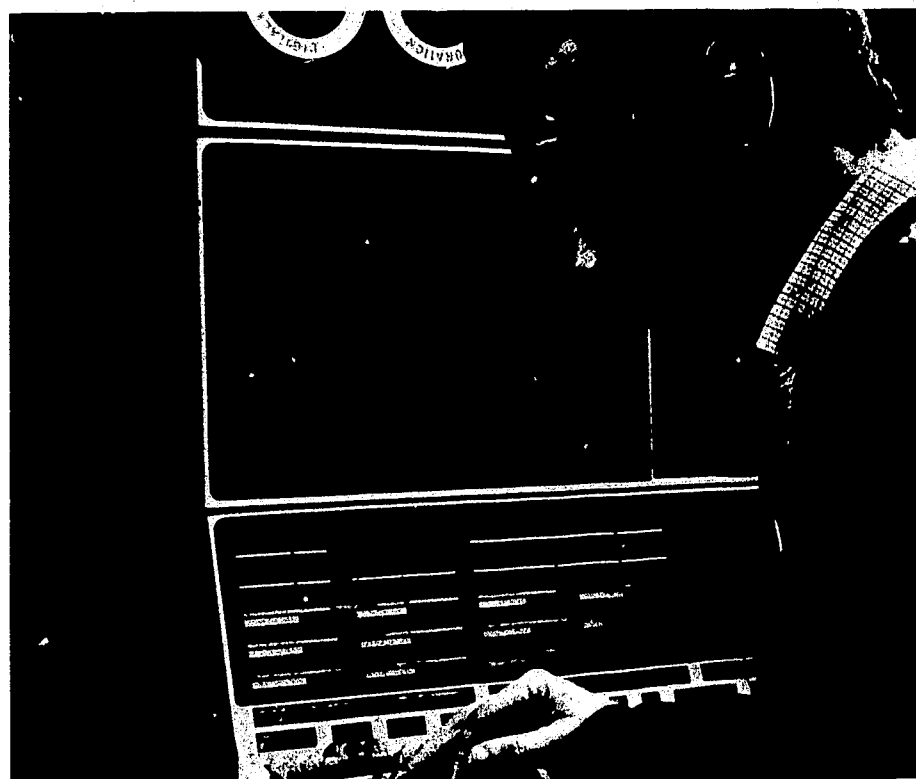
WHERE DO COMPUTER PEOPLE WORK?

The majority of electronic data processing (EDP) people are employed in the large cities. However, more and more EDP workers are being employed in rural areas as a result of the growth of industrial parks outside of the cities. In addition, computers can be programmed from remote terminals, across the country or around the world using telephone, teletype or communications via satellite. Although the central processing unit will generally be found in large cities, people who use them can be located wherever there is a need, as long as communication facilities, such as telephone lines, are available.

Hydro and power authorities, highway departments – and all other public utilities – transportation and insurance companies, banks, manufacturing concerns, and federal, provincial and municipal governments employ data processing equipment operators, programmers and systems analysts to process huge volumes of data. Computer manufacturers, wholesale and retail businesses, educational establishments and research institutes, and independent data processing centres would also be prospective employers for someone interested in this field.

**GROUP 1
EQUIPMENT OPERATORS**

DATA INPUT CLERKS

Key Punch Operators
Verifier Operators
Key Tape Operators
Remote Terminal Operators

PERIPHERAL (SUPPORT)
EQUIPMENT OPERATORS

Card-Tape Converter
Operators
High-Speed Printer
Operators
Sorting Machine Operators

COMPUTER OPERATORS

GROUP 2
PROGRAMMERS AND ANALYSTS

COMPUTER PROGRAMMERS
SYSTEMS ANALYSTS

For ease of understanding, the occupations in the electronic data processing field have been arranged into two main groups. The first is EDP equipment operators. The second is made up of computer programmers and systems analysts.

The first group of occupations requires a practical understanding of the computer and its support equipment. The second requires an understanding of the practical mechanics of a computer, a thorough knowledge of the principles of electronic data processing and computer "languages", as well as the internal functions of the company or institutions which require the data processing programming support.

NATURE OF THE WORK

GROUP 1
EDP EQUIPMENT OPERATORS

DATA INPUT CLERKS

A *data input clerk* uses a variety of keyboard machines to convert information into electronic impulses that the computer can understand. The three most important media for electronic impulses are magnetic tapes, magnetic discs and cardboard computer punch cards. The machines which produce these input media are operated by a keyboard similar to a typewriter.

Keypunch machines punch holes in computer cards in a pattern which the computer can interpret. As a keypunch operator, you would insert cards into the machine and then depress the keys in order to punch holes in the cards as indicated by a programmer's instructions.

A verifier machine looks very much like a keypunch machine. It is used to check the work of the keypunch operator. This machine is operated in the same way as the keypunch machine except that cards that have already been punched are inserted into the machine and re-keyed. The verifier merely indicates mistakes by putting a notch on the top of any card on which a mistake has occurred.

A key tape machine is much like a keypunch machine. However, the key tape machine produces electronic impulses on a magnetic tape when the keys of the machine are depressed. Your job as a key tape machine operator would be to insert the tape into the machine, and by depressing the keys, according to a programmer's master instruction sheet, place the information on the magnetic tape.

A remote computer terminal is basically a special typewriter that is connected to a computer using telephone lines. As an operator of such a machine you would transmit information to the computer using the typewriter keyboard.

The machines described in this section are data entry equipment. As a data entry clerk you may be called on to operate any or all of them. The specific machines you will handle will depend on the nature of the processing at the installation where you are employed and what equipment your employer has.

PERIPHERAL (SUPPORT) EQUIPMENT OPERATORS

A great variety of peripheral, or "support" equipment is required to make full use of a computer. This section describes some of this equipment and the duties of its operators.

A *card-tape-converter machine* electronically changes data from punch cards to magnetic tape or from magnetic tape to punch cards. As a card-tape-converter operator you would mount reels of tape or stacks of cards in the machine. These would be the input. After making sure that the machine was loaded with enough output material (either cards or tape), you would start the machine, and watch that it was running smoothly. When the run was finished you would label the card or tape output and store it for future use in a computer.

A *high-speed printer* is a machine that converts electronic impulses, usually produced by a computer, into printed material. As an operator of this machine you would make sure that enough paper was loaded properly into the machine, so that a clear, well-centred print-out was produced. When the run was completed you would remove the paper print-out and prepare the machine for its next run.

A *sorting machine,* as its name suggests, sorts computer cards. As an

operator of this machine you would place the cards to be sorted in the hopper of the machine, turn it on, and watch the machine, to ensure that the cards do not jam. When the run is over you would collect the sorted cards from bins, label them, and return them to storage for future use.

In any computer installation, all or some of these machines will be necessary. Depending on your skill and interest, you will eventually be expected to operate all of your employer's machines. After gaining experience in operating these machines, and with further training, you may become a computer operator.

COMPUTER OPERATORS

As a computer operator you would control an electronic computer while it processes business, scientific, engineering, or other types of data according to the specific operating instructions prepared by a programmer. A computer console works something like the control display in an aircraft – it tells you where you are at any given moment. For this reason, people in the computer field often refer to the operator's job as "flying the beast".

As you read the operating instructions prepared by the programmer, you would determine what equipment has to be set up and what order of operations is necessary. After disc packs and tapes, or decks of punched cards have been selected and mounted, you would then push the switches or keys on the console to start the computer. All the time the computer is running you would be monitoring its operation at the console.

One of your most important duties, as a computer operator, would be monitoring the equipment and control panel to check how the machine is progressing through the program. When corrections are necessary, you would feed alternate directions into the computer according to the programmer's instructions.

At the end of an operating run, you would review the work timetable and determine what the next run will be. You would constantly be keeping a record of the operating time and down time (non-operating time) of the equipment.

In some businesses, duties are rotated several times each day. For example, in a large computer complex you might begin your day mounting tapes or discs. Later you may be responsible for monitoring the computer console. Still later,

perhaps you would be operating
high speed printers, working in the
tape library, or operating any of the
support equipment described in the
previous section. In a smaller estab-
lishment, where there is only a
limited number of input and output
devices, you would probably oper-
ate all of them simultaneously as
well as the computer console. As
you prove your ability you may very
well become a shift supervisor —
responsible for the efforts of several
other operators.

Because the technology of elec-
tronic data processing is constantly
changing, some establishments are
continuously experimenting in an
attempt to determine the most effec-
tive ways of using their personnel.
For this reason, the duties of com-
puter operators will vary according
to the establishment where they
may be employed.

GROUP 2
PROGRAMMERS AND ANALYSTS

COMPUTER PROGRAMMERS

As a computer programmer, you would prepare detailed instructions to direct a computer through the various steps of a project. You might work for a systems analyst or under the general supervision of a senior programmer, but you would basically work on your own in converting business, scientific or engineering problems into detailed, logical flow charts, and then coding the information on these charts into computer language. For an example of a simple flow chart for a typical problem many people face, look at the attached drawing.
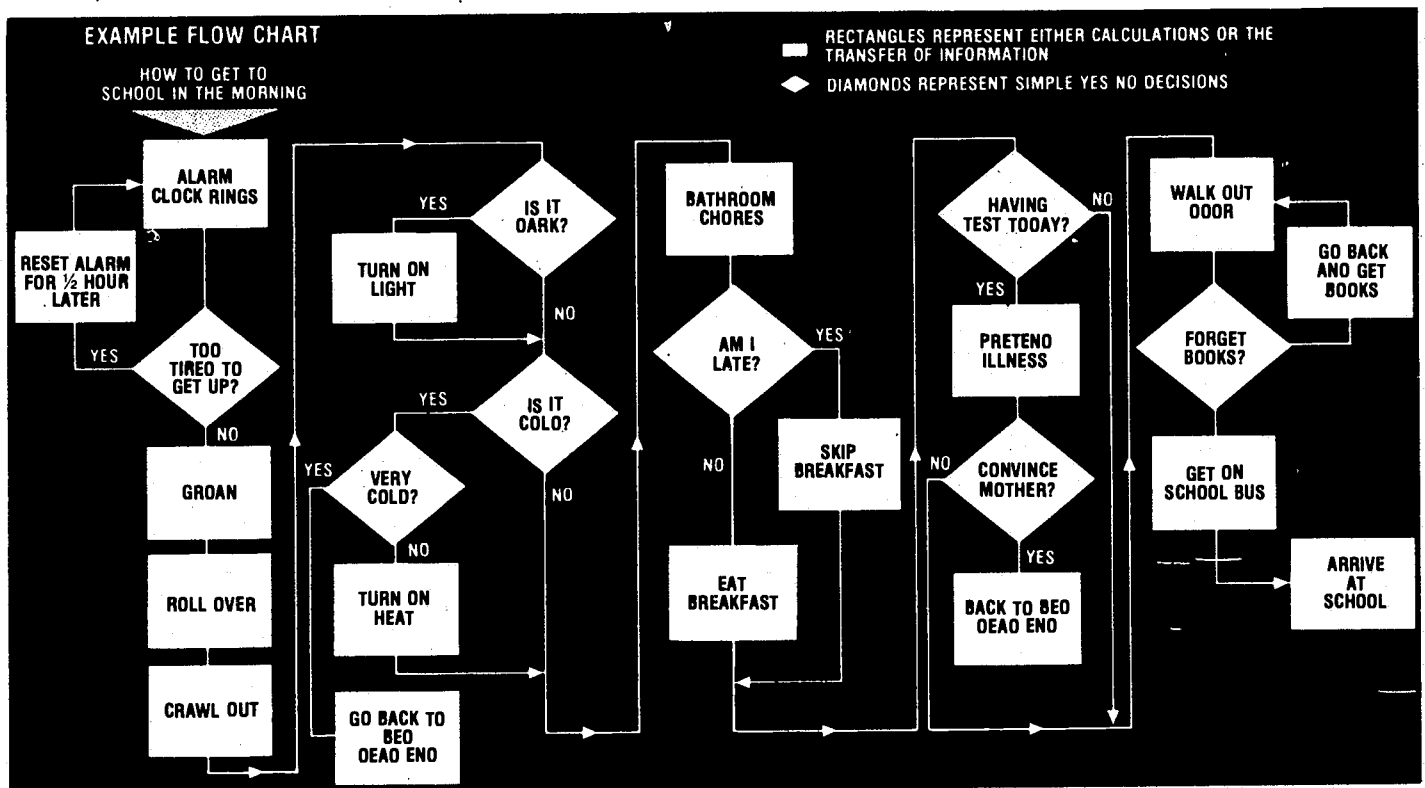
Having made up the flow chart, you would then translate it into a symbolic form using a language which the computer will understand. The most common computer language for business applications is COBOL, whereas the language most commonly used for engineering and scientific problems is FORTRAN. These are but two of a variety of computer languages in use.

The program which you prepare must include instructions on the handling of input or source material, the arithmetic or logical operations involved, and the output or final answer to the problem.

Part of your job as a programmer would be to select and prepare sample information to enable you to test run your program in order to decide whether or not it is adequate. You would observe the test runs of the coded program on the computer, and, where necessary, correct errors by changing the program instructions. Once the program has been perfected, you would prepare written instructions which would be bound in a "run book" to guide the computer operators.

You might be required to review and possibly change existing programs if requirements have changed since they were originally prepared. Frequently, only some parts of programs have to be altered. Naturally, it is important to keep abreast of new methods and techniques in the field and be capable of adapting these to particular operations in which you are working.

EXAMPLE FLOW CHART

HOW TO GET TO
SCHOOL IN THE MORNING

RECTANGLES REPRESENT EITHER CALCULATIONS OR THE TRANSFER OF INFORMATION

DIAMONDS REPRESENT SIMPLE YES NO DECISIONS

ALARM CLOCK RINGS

RESET ALARM FOR ½ HOUR LATER

TOO TIRED TO GET UP?

YES — GROAN — ROLL OVER — CRAWL OUT

TURN ON LIGHT

IS IT DARK?

VERY COLD?

TURN ON HEAT

GO BACK TO BED DEAD END

IS IT COLD?

BATHROOM CHORES

AM I LATE?

SKIP BREAKFAST

EAT BREAKFAST

HAVING TEST TODAY?

PRETEND ILLNESS

CONVINCE MOTHER?

BACK TO BED DEAD END

WALK OUT DOOR

GO BACK AND GET BOOKS

FORGET BOOKS?

GET ON SCHOOL BUS

ARRIVE AT SCHOOL

NATURE OF THE WORK

SYSTEMS ANALYSTS

Systems analysts solve complex business, scientific, or other problems. To begin working in this occupation you need experience as a computer programmer, and your knowledge of electronic data processing, and business in general, would have to be extensive.

Imagine this. You have spent a number of years working as a computer operator and later as a programmer, but now you have won a position in a new firm, as a systems analyst. Your employer has just given you your first project – assisting a client firm in developing a new inventory control system. Naturally, you want to make a good impression on your first assignment. What would you do?

You would start by meeting with senior people in the firm – department heads or project directors – to find out just exactly what their needs are and what they hope to gain from a new system. Then you would thoroughly examine their present methods in order to determine, first of all, whether or not an electronic data processing system is practical, and, secondly, just exactly how much it would cost. In analyzing their present operations you would rely heavily on process flow charts and diagrams which you would prepare based on your observations and information provided to you. From these you would consider the capabilities and limitations of computer and peripheral (support) equipment in the role they are expected to play in the firm. One of your biggest problems would be finding efficient methods of feeding all information necessary to your system into the computer (INPUT). You would also suggest additional uses the firm might wish to consider for their computer, or computer services, in the future.

After you have completed your study and arrived at conclusions regarding the proposed system, you would present your recommendations to the firm's management. You would include a detailed cost estimate and a summary of the financial benefits and other practical advantages of using the system.

If the firm's management decides to use the new system, either as you presented it, or with some changes, you will ensure that the necessary computer programs are prepared, tested and adjusted as required. You may actually write the programs, but more likely you will supervise computer programmers who will do this. It may be necessary for you to design new forms or other documents for use in the system you have developed. You may also have to figure out electric power, air conditioning, room environment, and other requirements, as well as possibly training people who will work with the system – and perhaps even writing instruction manuals for operating the electronic data processing equipment used.

You must keep in mind that we have been considering only one example of a business problem. Systems analysts work in governments, engineering, scientific, medical and a wide variety of other fields as well. However, the basic job remains the same: examining existing systems and procedures and attempting to find better ones.

If you demonstrate superior ability in your work as a systems analyst, it is quite likely you will eventually earn a position as a project manager, supervising one or more other systems analysts in examining business, scientfic or other systems.

SOFTWARE SPECIALIST

Most large centres require the services of one or more Specialist Tape Programmers. This person generates, maintains and constantly brings up-to-date Programs, supplied by manufacturers, so that the total Computer System is as efficient as possible.

This kind of work requires an individual who is extremely knowledgeable in assembly and machine programming languages. This person spends a lot of time meeting with the computer manufacturer regarding problems with the machine.

In order for complex computers and peripheral equipment to function properly, temperature, humidity, dust content of the air, and other factors, must be thoroughly regulated. Therefore, if you were employed as an EDP equipment operator you could generally expect to encounter a properly heated, lighted and ventilated working environment. However, you may be working with, or near, noisy machinery. The noise level will depend, of course, on the types and numbers of machines used in the establishment. Programmers and systems analysts usually have their offices located in quieter areas.

Since large computer systems and facilities frequently operate around-the-clock in order to maximize operating time, shift work is often necessary. Some people have difficulty in adjusting to sleeping during different parts of the day.

Programmers and systems analysts normally start their day at 8:30 or 9:00 a.m. and finish at about 5:00 or 5:30 p.m. However, if there is a problem with a program, they may work many hours of unscheduled overtime. People in all of these occupations work five-day weeks with 7½ or 8 hour work days.

People in this industry generally receive two or three weeks of annual vacation after their first year, as well as eight to ten days of statutory holidays each year. Other fringe benefits may include pension plans, life insurance programs and hospitalization insurance.
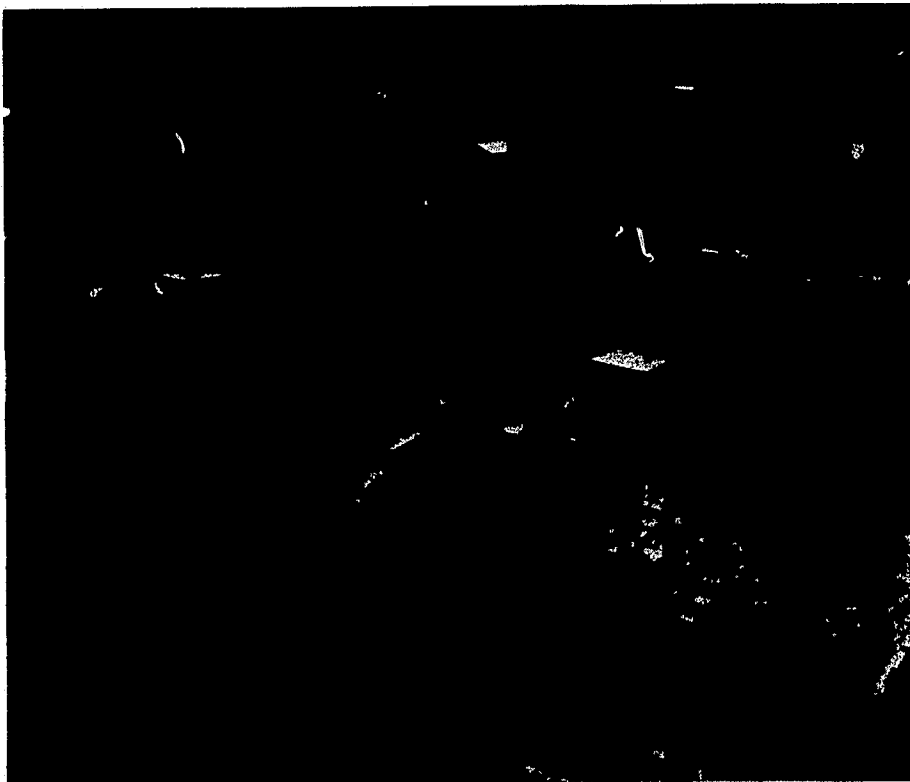
ADVANCEMENT OPPORTUNITIES

In the electronic data processing field there are opportunities for promotion and increases in pay for people who do their job well, have adequate educational background or practical experience, and are capable of handling increased responsibility.

Advancement will vary according to the group of occupations in which you are employed. For equipment operators advancement is generally to more complex equipment – from the data input positions, to computer support equipment, to operating the computer itself.

Computer operators, through on-the-job training, do acquire an exposure to programming skills, and usually are selected by their employers for programming positions. This is quite a large jump, however, and additional formal training will be necessary – either on-the-job or

at outside educational institutions.

With sufficient experience and demonstrated ability, and generally after even more formal training or education, a programmer may be promoted to a supervisory position, or to a position as a systems analyst. Systems analysts can progress through higher levels of responsibility as EDP projects managers, and to senior management positions in their organization or as consultants. People change assignments fairly regularly in this field, and some may work for a succession of different employers as they search for new challenges.

A university or community college background in electronic data processing can be an advantage, and is frequently essential, to someone wishing to progress to positions of higher responsibility.
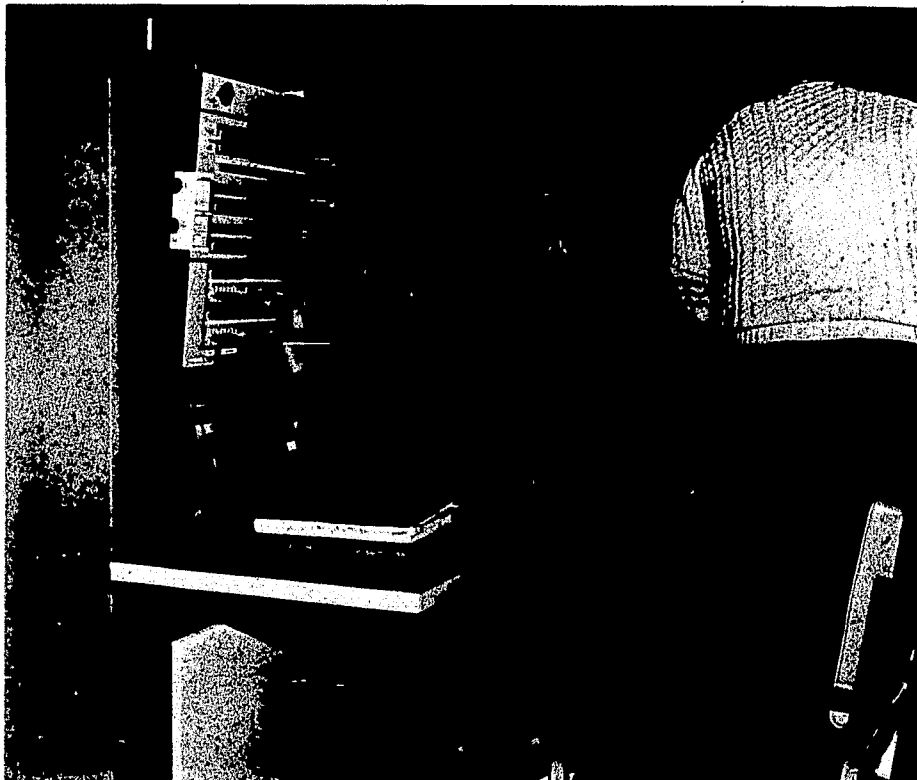
Data Input Clerks, Support Equipment Operators and Computer Operators

People who are successful at this type of work enjoy operating machines according to a general routine. Usually they are quite well co-ordinated especially for the data input positions.

Probably most important, they have the ability to read and follow detailed instructions accurately and quickly.

If you think you have these qualities and if you are at least an average student then you may find a satisfying career operating EDP equipment.

Programmers and Systems Analysts

As well as having average grades or better you must be able to speak and write clearly. The ability to represent and relate abstract ideas and express them using symbols and flow charts comfortably and quickly is also a necessary quality.

If you possess these abilities, and if you have an active, creative imagination and enjoy working with other people, this might be a good field for you.

PREPARATION AND TRAINING

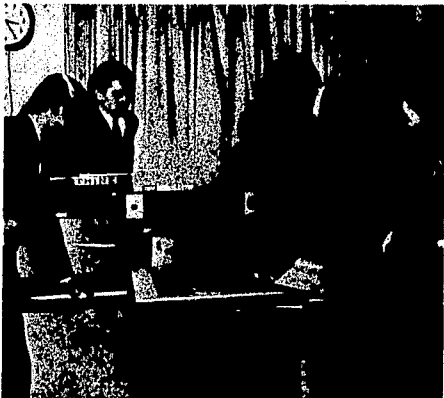## Date Input Clerks, Support Equipment Operators and Computer Operators.

For these occupations you should complete from ten to twelve years of general education, preferably with some courses in mathematics. The ability to type is important in all of these occupations. If you plan to become a computer operator you will usually require at least grade twelve education with a good knowledge of high school mathematics.

Once you have completed this formal education you will need between three months and one year of on-the-job training for the first two occupations and six months to two years of on-the-job training as a computer operator before you are fully qualified.

Programmers and Systems Analysts

Programmers can learn their occupation after secondary school graduation (with emphasis on mathematics and science) through on-the-job training for up to four years. Alternatively, they can take a two-year course in computer programming at an institute of technology or community college and then, depending on individual capabilities, spend one to three years of on-the-job training.

Systems analysts normally must complete a bachelor's degree in mathematics, engineering or science with courses in computer science or they may take a three year business information systems program in a community college. After completion of this education, people in this field will generally need up to four years of on-the-job training in progressively more responsible positions before they can consider themselves fully qualified as systems analysts.

Data Input Clerks, Support Equipment Operators and Computer Operators.

In 1974 there were approximately 32,000 people working in these occupations in Canada. People employed in this field are in the manufacturing, financial and community service industries as well as government. It is expected that employment in the EDP field will grow at a rate slightly above the average growth rate for all occupations in Canada until 1980. For the past several years there has been a shortage of qualified EDP people. Thus, opportunities look quite good for anyone planning a career in this type of work.

Although employment in these occupations is expected to grow, the use of punch cards as an input media is decreasing while the use of tape or disc producing equipment is increasing. For this reason, the number of keypunch positions is expected to get smaller with an increase in positions for key tape, key disc and terminal operators.

Computer Programmers and Systems Analysts

In 1974 about 26,000 people worked as programmers and systems analysts in Canada. Until 1980 employment in these occupations is expected to increase at about the same rate as the national average for all occupations. For the past several years there have been many openings available for programmers and systems analysts. Thus, at the moment, and for the foreseeable future, computer related occupations seem to offer good opportunities for qualified people.

WHAT'S THE NEXT STEP?

Before you choose a career, and while you are still in school, you should discuss your future plans with your school guidance counsellor. Your counsellor will be in a position to supply much more detailed information than can be included in this booklet, especially on such subjects as the admission requirements into university and community colleges. Your counsellor will also be able to help you decide whether or not your interests and abilities are really suited to the occupation you are considering. Counsellors in your local Canada Manpower Centre can also be of assistance, particularly in supplying details on job openings and demand for people in the electronic data processing field, not only in your own city or town but also across the country.

Once you have found a job opening, either through your Canada Manpower Centre, the newspaper want ads or by checking with friends then how do you convince them to hire you? Usually you'll try to get an interview.

Here are a few ideas that may help you with an interview. First, and most important, know what you want to do, what the company does, and something about the specific job you are applying for. This will help you to speak intelligently and show an interest in the job — two very important factors. Second, arrive on time and, when called to the interview room enter fairly quickly and as confidently as you can. Don't worry about being nervous — employers expect this. Answer the questions you are asked — stay on the topic. Finally, dress for your interview as you would for a normal day's work in the job for which you are applying. If you aren't sure how people dress, visit the office and check. So, know yourself, know the job, listen to the questions and don't worry about being nervous.

This booklet in the Careers-Canada series has been designed to give you some idea of the many opportunities in the world of work. To take full advantage of these opportunities, it is necessary to plan your future over as long a period as possible. Other booklets are being prepared, and you may wish to read several of these in planning your career.

For example, electronic data processing occupations would appeal to people interested in automatic information processing systems. You will find in this interest area, occupations that require anywhere from about two years of high school to several years of post-graduate university studies. It is hoped that, after reading some of the material, you will be better able to select certain options which may be open to you in school, or through various training programs.

Such long range planning, of course, is fine if you have the time — but if you have left school, or wish to change occupations, you may need exact information about a particular occupation in your province right now. For this reason, a second series has been prepared under the title of Careers-Provinces. This series consists of a number of leaflets — each covering a single occupation — giving precise details of preparation and training, licensing or certification requirements, and pay scales. Careers-Provinces leaflets are available at your local Canada Manpower Centre and have been made available for use in high schools and other educational institutions.

As well, there are two standard publications — The Canadian Classification and Dictionary of Occupations. Volumes 1 and 2 — which contain a classification, and definitions of over 6,700 occupations. These publications can be seen in Canada Manpower Centres, or can be ordered from Information Canada — catalogue number MP53-171/1 and MP53-171/2. The current price is $20 per copy.