

Computers control the world

By Teri Cathro

It's not generally known that the complex microcomputers of today descended from the simple abacus in use 5,000 years ago in the Orient.

And it's difficult to imagine that the latest video game components probably employ newer electronic technology than computers used for national defence purposes.

In this age of advanced technology, we have computerized drafting, exercise bikes, automobiles, microwave ovens, televisions, computerized home security systems, and even coin-operated computers. Computers can be found in virtually any field, from medicine to military.

Walter Czornyj is a senior engineer at Bristol Aerospace Limited, which manufactures everything from propellant and electronic data instruments for rockets, satellites and weather stations, to nuclear reactor components.

Czornyj, 25, graduated from the University of Manitoba's electrical engineering program in 1978, and now he's designing and building both the hardware and software for a micro-computer-based weather station. Computer hardware is the actual mechanics of a system, while software refers to the programming.

Czornyj, who refers to himself as an electronics engineer, said, "I first thought of electrical engineering as wiring and big power station engines. Now, electronics has blossomed into microprocessors."

His choice of an engineering career came about, he said, because "I was a whiz at math and physics in high school. A science degree seemed to lead to no definite goal, whereas, with an engineering degree, I could begin designing circuits right away."

He believes that electrical engineering graduates with a penchant for computers can easily find employment with virtually any company using microprocessing equipment, since computerized systems are increasingly being used to monitor everything from plant temperature to production.

"Computers are being used in so many places now that people with that sort of experience are very valuable," he stressed.

Czornyj said some students experience disappointment on joining the workforce after university because commercial companies sometimes lack the 'exotic' equipment available at university. But, he added, "I was surprised that the work was very similar. At Bristol, I stepped right into modern technology."

In the fast-changing world of computer engineering, he went on, companies come up with better, faster, more efficient microprocessors every year, and if they are going to stay in competition, they have to re-design their computers, making use of the new electronic developments.

Czornyj believes young people today are getting better experience with computers at the junior and senior high school level than he did. "The first time I touched a computer was in university. Now they're banging out programs in grades nine and 10," he said.

Kids love them

Computers are part of the young person's world, Czornyj said. Older people are apt to be afraid of touching computers "in case they bomb out the system. But kids aren't afraid to try it and start typing merrily."

Ian Walkty spent seven years with the Department of National Defense in Dartmouth, N.S., developing anti-submarine detection equipment. In the 2½ years he's been with Bristol Aerospace, Walkty, head of the company's data collection systems section, has been designing computer hardware for use in data collecting and processing equipment.

The degree of difficulty in designing an instrument depends on what it will be used for, Walkty explained. "If it has to work over a wide temperature range, for instance, components from off the shelf might not work. Often, we have to design components to increase accuracy of a system."

Walkty, 31, a 1973 graduate of the U of M's electrical engineering program said "the average person doesn't realize what goes on in the area of electronics and computer application. Most people who know me probably think I work on aircraft."

Glen Catlin, manager of Bristol's electrical engineering department, graduated from the U of M in 1957 and went to work for a large American electronics company as an engineering designer.

At that time, companies were just starting to incorporate computers. "A computer then was a room full of equipment," and very expensive. Now, the whole thing has evolved into microelectronics and integrated circuits, and has been reduced to a size anybody can have."

Catlin thinks computers are still too difficult for the average person to use. More development work is needed to make them cheaper and easier to operate, and to increase the instrument's memory capacity. He predicts that



Computer engineers Joan Coughlin and Ken Buechler of Sperry Univac: Designing and coming up with new ideas.

perhaps in the next decade, operating complex equipment will be "as easy as talking, because computers may well be equipped with voice-recognition components."

Neil Williams is in charge of software engineering at Sperry Univac Defense Systems in Winnipeg. The 1977 U of M computer science graduate said he's had his eye on computer work since he was a junior high school student and realized there was a future in it. "Whenever you talk about computer work, there's a kind of mental block you have to overcome to comprehend it. I got over it in high school, so I was in the right frame of mind when I got to university."

Williams said his job entails providing support to the hardware designers, helping them verify design changes as well as working with the programming systems. "We've developed a pretty advanced level of expertise around here," he said, citing rugged electronic military computers for air and sea navigation, communication and electronic warfare.

But keeping up with advancements in the industry isn't easy. "There's so much work out there to be done, you can still be doing worthwhile tasks even with 20-year-old equipment."

Williams added: "I'm not afraid of learning new things. You can't stay stagnant in this field. You might be able to find jobs, but you certainly won't advance without effort."

Joan Coughlin is a newcomer to the computer field. A former medical lab technician at the Cancer Foundation, Coughlin found that after five years of lab work, she needed a change. "I always liked math and didn't want to go into medicine," said Coughlin, 31, who graduated with

her electrical engineering degree in April. Now, as a software engineer at Sperry Univac, she's in the process of making changes to the operating system of a microcomputer and comparing the standard engineering functions of two different computers to see if it can handle a prescribed workload.

Ken Buechler has spent nearly three years at Sperry Univac as a computer engineer. Buechler attributed his interest in computers to his father, Wallace, who "was always an electronics nut, too."

Wonderful feeling

The 27-year-old engineer, who received his electrical engineering degree three years ago from the U of M, said, "I like designing and coming up with new ideas, as well as the feeling of accomplishment when I see it working."

Buechler said he finds challenge in "pinpointing and correcting problems in production. It feels good when you hunt around for days on a problem and finally overcome it."

Buechler said he found that politics and management were two subjects that weren't taught him in university. "It's something new when you go to work in a big company. Everybody has his or her own job, and you are expected to know a lot. I've probably learned more from three years in the field than in four years of university." But, he pointed out that "without a university background in engineering, you can't do any good for anybody."

The key to designing computers, Buechler said, is to make the hardware and software compatible. A well-designed piece of hardware must also be easily programmable or "it's not worth as much" to the company. He contends that "something not really taught well

(at the university level) is systems architecture, or how the hard and software work together. When you get the whole idea, you can do a better job in whichever area you work."

Until this year, most people working in the computer engineering field have been electrical or computer science graduates. This year, the U of M is offering a separate computer engineering degree program, and Professor Mohan Mathur, head of the department, said 30 students have already enrolled.

Computer engineering is open to students who have completed two years of basic electrical engineering courses like electronics, digital logic, circuit theory and computer programming.

"Our emphasis is on preparing students to become designers of computer hardware and systems," Mathur explained. "Ever since integrated circuits came onto the market, the micro-revolution has created a demand for graduates from digitally-oriented courses." He said a survey of employers and potential employers of computer engineers representing 47 provincial industries conducted 18 months ago, disclosed a need for computer engineering graduates. Other studies have shown "a gross shortage of computer engineers and scientists," he said.

So far, there is only one accredited computer engineering course in the country — at McMaster University, Hamilton, Ontario.

The University of Manitoba, plus a handful of other institutions, including Concordia University, University of Alberta, and Carleton University, have begun computer engineering courses. U of M engineering professors expect to receive accreditation near the beginning of the final year of the first graduating class.

Engineers are needed

Computer engineering "is a very new thing, and we have responded to it fairly early," Mathur said. He pointed out that the entire electronics industry is moving in the direction of computers, and "we need engineers who understand and can design computer-based controls and processors."

Mathur said students entering the new course will spend more time on computer-related courses than previously offered in electrical engineering, and that they can choose courses which will lead them into either software or hardware specialties.

He concluded that "the future looks very bright right now, and graduates should have no difficulty securing jobs."

Computer engineers

□ **Education:** For the first time this fall, the University of Manitoba is offering a separate degree program in computer engineering. Entrants to the program must have completed two years of basic electrical engineering. The final two years are geared toward computer programming and design. Third-year courses include subjects like microprocessing systems and digital logic sub-systems, while fourth-year electives include advanced data structures, programming language and language translators. Students will graduate with a Bachelor of Science degree in computer

engineering. For more information, contact Electrical Engineering, Room 458, Engineering Building, University of Manitoba, Winnipeg, R3T 2N2.

□ **Salary range:** Art Round, chairman of the salary survey committee for the Association of Professional Engineers estimated the salary of a computer engineer would start at about \$23,000/year ranging to \$31,000/year after five years.

□ **Job future:** Good. Surveys show a gross shortage of computer engineers and in all areas of computer work.

□ **Employers:** Any business, industry or government agency which relies on computers or computer-based systems.

Career insurance too popular

Financial analysts, economists and editorial writers are vying with each other to definitively define the economic climate. Stagflation, recession, slow, growthflation, are a few of the labels.

Aside from the description, mystics are still peering into very misty crystal balls: it's going to end soon; interest rates really are on their way down; the stock market is already picking up; we'll see a turning point in 1983.

John Loriman is pretty sure he has some answers: it's a depression, and it's not getting any better.

Loriman is the national product manager of Careerguard. Careerguard is an innovative new insurance policy designed to insure professionals from these gale-swept economic times — insure them against the possibility that their jobs will disappear because their company merges with another, or simply because of "administrative" changes — which basically means times are tough.

"When we introduced this policy last February," Loriman says forthrightly, "we thought it was a great idea for a



Dian Cohen

recession. Seven insurance companies got together to back Careerguard and its parent company, Gescas. We had (and still have) no competition in the field because no one company is prepared to put in the effort involved in marketing such specialized insurance."

Gescas is ideally suited to career insurance, having already developed policies to cover aviation and professional liability claims. Basically, career insurance takes a yearly premium of 1.3 per cent of a professional's salary plus 10 per cent — a \$50,000-a-year engineer, for example, would pay \$715 a year.

For that amount, and if he held on to his job for six months (during which time there is no payout) he could expect the following from Career-

guard: fired or paid off within one year — six months' salary; fired or laid off after being with the firm 1 to 5 years — 12 months' salary; fired or laid off after being with the firm more than 5 years — 24 months' salary.

Careerguard employs the top head hunters in the country to help speed a client on to another job.

Careerguard came on to the market exactly six months ago this month, so it is only in the last week that claims started coming in. But Loriman says they had advance warning that this was no mere recession.

"We sold the insurance last November and December to a test group which became eligible to make claims in May and June. We had a good idea of how many or what percentage of the test group should have made claims, based on the experience of past recessions. But by the end of June, we were swamped. As far as we're concerned, this is definitely no recession."

Last month, in light of the record numbers of professionals having legitimate claims, as well as the difficulty experienced in placing them in new jobs, Loriman says the company did a

"serious review of the premium structure." The first decision was that the premiums had to be raised from a flat 1.3 per cent to an average 3 per cent, "partly to raise the money available to honor the claims, and partly to discourage some people from buying the policy."

What industries and occupations are the most hazardous from the viewpoint of layoff? Most of the construction-related jobs, says Loriman — mining, oil, consulting engineers. "Managers in transportation, communications and utilities are much less likely to be laid off, and easier to place in new jobs if they are."

Does Loriman think Careerguard will disappear because too many people are likely to buy it and then get laid off?

"We don't think so at the moment, and we're doing everything we can to keep our original policyholders' premiums at the 1.3 per cent level."

But Loriman says, after a second's pause, "you know what Goldwyn said — one should never prophesy, especially about the future."

Bun, cookie baker offered \$8.50 hourly

Canada Employment Centres in Winnipeg have a variety of job order on file. A representative sampling follows:

INQUIRY OFFICER (4695) For central Winnipeg firm. Should have bilingual capacity and must have university degree, good communicating skills and be tactful and diplomatic. Required to respond to telephone inquiries from citizens and direct callers to appropriate government departments. \$12,000 to \$15,000 annually.

WINDOW INSTALLER (3371) For Winnipeg area. Must be experienced, mature, have a driver's licence and be able to drive a standard shift vehicle. Duties consist of installation of aluminum windows, tri-pane and aluminum doors. \$7 to \$8 hourly, depending on experience.

AUTOBODY REPAIR WORKER (6344) For Transcona area. Must have own tools, be fully qualified and reliable. \$9.50 hourly.

RETAIL MEAT CUTTER (3363) With minimum of 3 years' experience; required to prepare consumer portions for in and over counter sales. \$7 hourly plus, depending on experience.

INSULATION INSTALLER (5311) For Winnipeg area. Must have CGSB qualifications and ability to drive 3-ton truck with a 20-foot trailer. Salary is piecework \$15 to \$20 per home.

DENTAL HYGIENIST (6290) For Elmwood area. Will consider recent graduate. Monday to Friday, 8 a.m. to 3 p.m. \$2,000 monthly.

TV TECHNICIAN (5309) For Fort Garry firm. Minimum 2 years experience required and a graduate of technical school preferred. \$6 hourly, and up.

TELEPHONE SOLICITOR (8333) For part-time work in St. Boniface. Hours 10 a.m. to 2 p.m. Must have own transportation; bilingual person preferred, with pleasant personality. \$4 hourly, plus commission.

BAKER (7334) For north end. Must have 5 years' experience and ability to bake buns and cookies. \$8.50 hourly to start.

LIFEGUARD (9544) For St. James area. Must have Bronze Cross, Red Cross or YMCA instructor certificate. Lifeguard duties for one month, then responsible for setting up and directing aquatic program. \$4 hourly to start.

Anyone interested in these jobs should note the order number and apply at the nearest Canada Employment Centre — 344 Edmonton Street, 393 Portage Avenue, 1841 Main Street, 1822 Portage Avenue, 220 Hespeler Avenue, 170 Marion Street and 1048 Pembina Highway.