LAND OF THE GIANTS

A HISTORY OF MINNESOTA BUSINESS

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The end of World War II in 1945 caused a great amount of turmoil for Minnesota manufacturers engaged in defense work. They knew that when the war ended, the demand for their products would evaporate overnight, and although they expected it, the executives operating these plants were so busy producing war goods right up to the time of the Japanese surrender, they had little time to prepare for the inevitable falloff of orders.

When the war ended, many of them were practically walking around in a daze, wondering what the future held for them. Typical of these bewildered businessmen was John E. Parker, founder and the chief executive of Northwestern Aeronautical Corp. (NAC) of St. Paul. NAC operated a government-owned facility at 1902 Minnehaha Ave. in St. Paul, building wooden gliders for the Army Air Corps and fuel tanks for military aircraft.

A Washington, D.C. resident before the war, Parker was a graduate of the Annapolis Naval Academy and had embarked on a career as an investment banker before the war started. When the military officials in Washington decided on the need for a glider-manufacturing facility, they selected Parker to head the project and Minnesota as the site for the huge factory. Parker and NAC built more than 1,500 gliders before the war ended, including those used in the Normandy invasion in 1944. The wooden craft were military personnel carriers used in airborne assaults.

One of the larger defense plants in Minnesota, and the second largest glider-manufacturer in the country during the war, NAC found itself without a single order shortly after the war ended. Founded specifically for the war effort, NAC had no peacetime product and no experience in any other field. Parker enjoyed living in Minnesota, still had his manufacturing facility, and wanted to continue in business here. All he needed was a product.

While Parker was looking, another displaced veteran of the war effort was trying to interest someone with money in an idea he had. This was William C. Norris, a Nebraska native who found himself at the end of the war a lieutenant commander in the Navy working on secret cryptographic analysis for a hush-hush military agency in Washington. A 1932 graduate of the University of Nebraska, Norris was an electrical engineer working for

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Westinghouse when the war began. His experience with the Navy excited Norris about the future possibilities of experiments in the new field of electronics he had been conducting, and his idea was to establish a business to design and fabricate equipment for a market he knew existed in the government.

The field of electronic computers was in its infancy in 1945, but Norris, who later founded Control Data Corp., now one of the giants in the computer industry, was convinced there was an entirely new world opening up in this direction. Norris was on the ground floor of the exciting computer age, and unlike others who joined him, clearly saw the vast opportunities ahead. An associate of Norris, who observed his uncanny ability throughout the years, said, "Bill Norris can see further into the future than any man I've ever met."

In 1945, however, Norris was having trouble finding people to accept his vision, especially someone with the capital to back his idea. Norris did convince two other Navy veterans, Howard T. Engstrom and Ralph L. Meader, of the merits of his plan, but, like Norris, they had skills in computer technology, but lacked the one essential ingredient—money. Engstrom had worked in Washington with Norris in projects on equipment for deciphering secret codes and on punched-card devices which were the predecessors of today's computers. Meader, a Navy captain, was in charge of the Navy's Computing Machines Laboratory at a military department inside the National Cash Register Co. in Dayton, Ohio. Meader had planned to stay on with National Cash Register after the Navy had requested the company to continue in computer work after the war. The company, in what turned out to be a blunder, rejected the offer in preference to devoting its energies to producing cash registers. The company later got into the computer business, but never caught up to the firms who were first in the field.

Norris, Engstrom and Meader were now firmly agreed they could start a computer company if they could find financial backing. They easily convinced a large group of restless military veterans, each highly qualified with engineering or other technical backgrounds, to join their project. The months slipped by, however, without an actual company being formed, and the three founders began to worry their skilled team of experts would find other opportunities before they could get started.

Then, in late 1945, Meader was introduced to the Northwestern Aeronautical Corp. founder, John Parker, through a mutual

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friend at the National Cash Register Co. facility in Dayton, Ohio. Parker, still looking for a worthwhile product for his empty St. Paul facility, immediately was interested in Meader's plan. Parker then met with Norris and Engstrom, who provided further details. Before Parker would commit himself, however, he arranged a meeting with top Navy officials in Washington where Meader, Norris and Engstrom could fully explain the nature of their proposed business. The senior Navy officers present listened with interest, and said if the group formed a company, it could count on some immediate government contracts in the computer exploration field.

Parker was convinced. He arranged the financing and turned over the NAC facility in St. Paul to the new firm. On Jan. 8, 1946, Engineering Research Associates (ERA) was incorporated in Minnesota with half-ownership going to Parker and the investors he had lined up, and the other half to Meader, Norris, Engstrom and their crew. The initial investment was only $20,000, but Parker agreed to put up another $200,000 as it was needed. Parker was named ERA president with Meader, Norris and Engstrom each appointed a vice president.

With the 40 technical men Norris had already recruited, ERA was in business immediately. Other engineers and scientists, out of work after duty in either the military or defense plants, eagerly applied for jobs at ERA. Each new employee was required to buy some stock in the new company. Two Navy contracts were received as promised, and work got under way.

The company's plant at 1902 Minnehaha Ave. was far from being ideally suited for work by skilled professionals on electronic experiments. It was originally a foundry for the American Radiator Co., then a warehouse used by the government during the depression, and finally a glider-manufacturing plant during the war. The building had high ceilings with skylights which opened and closed by pulleys, but they operated very slowly, and when it rained the scientists and engineers could expect to get drenched before the skylights were closed. And there were usually more birds in the building than workers, except in the winter when the birds left for warmer climates. The ERA staff coped with cold working conditions by wearing coats and mittens at their drawing boards.

In August 1947, ERA received a contract to design and build the first general purpose computer system. It was completed in late 1950 and installed in a National Security Agency facility in Washington, D.C. The system, called the Atlas, was the first step in the new, booming computer age. Another Atlas was delivered to the same agency in 1953, and a year later, a modified version, called the ERA 1101, was designed and built for commercial use. The world's first commercial computer was a giant, weighing more than 16,000 pounds. The ERA 1101 consisted of seven cabinets, occupying a space 45 feet long by nine feet wide, housing 2,700 vacuum tubes and miles of electrical wiring.

While this first computer was being constructed, other, more advanced models were being designed at the ERA plant, which had more than 700 employees testing and building various electronic systems.

Because ERA was one of the first computer companies in the United States, other firms, as they entered the field, looked to the skilled technicians at the St. Paul facility for trained workmen. Among those successfully recruiting some top ERA staff was Remington Rand, Inc., which entered the computer field in 1949. Remington Rand enlarged its operations in 1950 when it acquired Eckert Mauchly Computer Corp., and on Dec. 6, 1951, it offered the shareholders of ERA a tidy $1.5 million for ownership of the Minnesota company. The acquisition wascompleted a few months later, and the original shareholders of ERA each received a sum 80 times what they had invested in 1946.

Interestingly, in buying ERA, Remington Rand, got more than it had bargained for. ERA, under a top secret government contract, was working on an advanced computer, to be called the Atlas II, which could not be disclosed to Remington Rand officials, because they did not have the proper security classifications. It was after the purchase was completed before the company's top executives even knew of the existence of the vastly superior Atlas II model. The Atlas II, also called the ERA 1103, was a whopping success for the new owners. Four systems were sold in 1953, and 16 others eventually were marketed before even better models were introduced.

Remington Rand, with its Minnesota-based ERA facility, its Eckert Mauchly Computer Co. subsidiary in Philadephia, and its own computer development laboratories in Norwalk, Conn., was clearly the dominant computer company in the world. With a decided advantage in the manufacturing area, Remington Rand decided in 1953 to strengthen its sales and marketing program by opening a consolidated selling office in New York. The ERA president, John Parker, was moved to New York to head the office.

Parker was instrumental in keeping Remington Rand far ahead of the nearest competitor, International Business Machines (IBM), during the mid-1950s. Parker beat out IBM with several significant computer sales to such firms as U.S. Steel, Metropolitan Life Insurance Co., General Electric and Westinghouse.

As Remington Rand's computer operations began to mushroom, however, its needs for expansion capital was becoming critical, mainly due to the fact its computers were being rented instead of sold. With so much of its energies now being devoted to financial problems, Remington Rand began to lose ground quickly to the aggressive and fiscally healthier IBM.

James Rand, the head of Remington Rand, decided the only solution was to sell his company to a heavily capitalized firm, so on June 30, 1955, his firm was sold to Sperry Gyroscope Co., and the new Sperry Rand Corp. resulted. One of the first steps taken by the new owners was to consolidate all the various computer arms into a single division, and the head of ERA in St. Paul, William Norris, was named general manager of all computer operations, to be called the Univac Division of Sperry Rand.

The Univac Division, which eventually grew to a volume exceeding $2 billion annually in revenues with more than 50,000 employees worldwide, still has its main manufacturing facilities in Minnesota and in the late 1970s had more than 12,000 workers in several Twin Cities plants.

Norris managed the vast computer operations for Sperry Rand for the next two years, and although 80 percent of all computers in service in the U.S. came from his division, he could see the ambitious IBM making rapid strides that worried him more than his Sperry Rand superiors. He also realized that future sales of computers would be in the commercial area and not so dependent on government use, as had been the case. Norris felt a frontal attack by Sperry Rand against IBM would be prohibitively expensive.

In 1957, Norris made a decision. He would form his own computer manufacturing company in Minnesota, and instead of competing head-on against IBM and Sperry Rand, he would specialize in computer equipment they didn't offer. He had much quicker success in finding financial support with his new firm, Control Data Corp., than he experienced in forming ERA. Within 10 days of issuing a mimeographed prospectus, Norris sold enough stock in a public offering to form his corporation. He had 300 stockholders buying 615,000 shares of common stock at $1 a share, enough to get started. Norris himself invested $75,000 in the

new company. He opened offices in July 1957 on the second floor of the McGill Building, 501 Park Ave., in Minneapolis, across the street from the Minneapolis Star & Tribune Building. On Nov. 25 that year, Control Data purchased the Cedar Engineering Co., which had manufacturing facilities in St. Louis Park, a western Minneapolis suburb. Cedar, which had been making instruments and control devices, had $2 million in annual sales, 165 employees, and was acquired for $428,000.

There were problems galore in the early years for Norris and Control Data, and the situation appeared particularly glum when he and his top 20 executives all took 50 percent cuts in their salaries, and the company stock dropped to a low of 25 cents a share. Faith in his own ability and the extremely favorable investment conditions existing in those days in the stock market pulled Norris through the trying period. He said in 1957 that his personal goal for Control Data was $25 million in sales at the end of five years. By 1962, Control Data showed $42 million in sales with a half-million dollars profit. The stock had climbed to a high of $35 a share that year, after an earlier three-for-one split, which meant that the original stockholders had seen the value of each $1 share soar to $105 in less than five years.

Control Data had more than 2,000 employees in 1962, had moved its headquarters to the Minneapolis suburb of Bloomington, and had acquired two small computer companies, had opened data centers in other states, sales offices throughout the U.S. and in several foreign countries, and, most importantly, was working on the world's largest and most powerful computer.

In 1963, the year Control Data stock was listed on the New York Stock Exchange, the company introduced its giant computer, the CDC 6600, a machine which staggered the industry. Containing 350,000 transistors and resistors and 80 miles of electrical wiring, the 6600 was the undisputed king of computers. This had been Norris' strategy from the beginning—to build computers not offered by IBM, Sperry Rand or other competitors. And while he was not competing with them, they weren't happy with the upstart Norris and his young Control Data organization.

T.J. Watson Jr., head of IBM, by then the leader in the computer industry, wrote a memo, dated Aug. 28, 1963, which clearly expressed his feelings about Norris and Control Data. The memo, sent to Watson's seven top assistants, read:

"Last week, Control Data had a press conference during which they officially announced their 6600 system. I understand that in

the laboratory developing this system, there are only 34 people, including the janitor. Of these, 14 are engineers and four are programmers, and only one person had a Ph.D., a relatively junior programmer. To the outsider, the laboratory appeared to be cost conscious, hard working and highly motivated. Contrasting this modest effort with our vast development activities, I fail to understand why we have lost our industry leadership position by letting someone else offer the world's most powerful computer. I think top priority should be given to discussion as to what we are doing wrong and how we should go about changing it immediately.''

From that point on, even though Norris wasn't interested in competing with IBM, Watson saw to it that IBM competed with Control Data.

Norris, with the help of unusually healthy activity in Control Data stock trading, embarked on an aggressive acquisition program during the mid-1960s, greatly expanding the company's operations and production capabilities. Starting in early 1963 with the acquisition of the computer division of the Bendix Corp., Control Data went on to buy Meiscon Co., a civil engineering firm; Electrofact of Holland, which gave the firm an entry into the common market; Digraphics Division of Itek; Bridge, Inc., a manufacturer of peripheral products; Rabinow Engineering; OCR Systems; the Transactor Division of Stromberg; Adcomp; Data Display; Datatrol; Computec; Preston Associates; Librascope Division of General Precision; Howard Research, and Waltec Ltd. of Hong Kong.

Norris was serving notice on the entire computer industry that his Minnesota company would be a serious contender in what was becoming a highly competitive field.

IBM, however, was carefully planning its own strategy against Control Data, and its proposed entry into the giant computer business almost destroyed Norris' organization by 1966. IBM, shortly after Watson's memo about Control Data, announced with great fanfare its 360 computer, a system which it said would perform both small and large computing chores, and then later its 360/90 system which was even bigger and better. The IBM announcements posed a serious problem for Control Data, because many potential customers decided to wait until the IBM systems were available, causing a sharp falloff of orders for Norris.

The active competition from IBM forced Control Data to cut its prices and to make several concessions to customers, such as penalty clauses. A good example was in the 1965 bidding for a large computer for the Bettis Atomic Power Laboratory, operated by Westinghouse. It needed a big system and accepted IBM's lower bid, but, then suspecting the proven capabilities of the Control Data 6600 would better answer its needs, asked Control Data to requote. Norris knocked down the price to $6 million and a 6600 was installed in September, with a penalty clause as part of the contract. Troubles developed after installation, and as Control Data technicians worked feverishly to correct them, the company was penalized $3,000 a day for 180 days until the system was running smoothly.

In addition to the stiff competition, Control Data was facing other serious problems as 1966 arrived. The leasing of machines was becoming more popular, causing a cash flow problem for Norris, and Control Data stock was falling, making it more difficult to obtain financing. The large number of acquisitions was causing a tremendous drain on capital, the company's research and development requirements had to grow in order to stay competitive, and as costs rose and sales fell, the company's profits dropped, further hurting the price of the stock.

Norris was faced with probably his most serious crisis in early 1966. It appeared he had three options: sell the company or parts of it, borrow enough money to stay alive, or borrow a large amount of money and continue to expand and compete with the industry giants.

Norris spent little time on the first two options and by February 1966 had talked 10 banks into setting up $120 million in a revolving credit account for Control Data. It was enough to pull the company out of the slump, and things began to pick up from this point. By the end of fiscal 1966, Control Data was able to show a profit of nearly $2 million on $167 million in sales. The company now had more than 11,000 employees. In July that year, Control Data had its biggest month in its history with $60 million in orders. The worst seemed over. By the end of fiscal 1967, the company had earned more than $14 million on $328 million in sales, and its stock was selling at nearly $80 a share after a three-for-two split the year before.

Perhaps the boldest move ever made by Norris, and one of his most successful achievements, was the acquisition of Commercial Credit Corporation in 1968. It seemed impossible that Control Data, with total assets of only $350 million, could expect to buy giant Commercial Credit, with assets of more than $3.5 billion, but Norris completed the purchase in June 1968 with $700 million

in Control Data stock as the price. Commercial Credit, with head-quarters in Maryland, was involved in consumer loans, leasing and insurance besides offering data processing services. It also had some manufacturing plants. In later years, when computer profits declined, it was the steady earnings from Commercial Credit which kept Control Data healthy and able to expand.

As the 1960s ended, Control Data was regarded in business circles throughout the country as a classic textbook example of what a brilliant entrepreneur could do with an idea. Norris in the dozen years since founding his company, had sales in 1969 of over a billion dollars with more than $41 million in profit. Control Data stock was trading at $160 a share, and the company had more than 40,000 employees throughout the world. The company started construction that year also on its new $15 million headquarters building in Bloomington.

The 1970s, with its recessions and other problems, caused set-backs for Control Data along with all businesses, but shrewd management by Norris and his assistants prevented any serious crises. The company topped the $2 billion in annual sales mark in 1976, and has joined the other Minnesota business giants as another good example of just how far a small concern can go.

Control Data, although the most successful, was only one of many Minnesota computer companies spinning off from the original ERA experiment in St. Paul.

Norris, Parker and the other scientists and technicians who were busy chasing birds out of the former glider plant in St. Paul during the late 1940s could have never dreamed that within 30 years they would have spawned not only the multi-billion dollar Control Data Corp., but more than two dozen other computer companies in Minnesota.

The ERA operation, in addition to providing the nucleus for to-day's giant Sperry Univac, was the training ground for future executives in nearly all the country's top electronics firms. In 1957, when Norris left ERA to form Control Data, three other companies evolved from ERA—Fabritek, Midwest Circuits and Transistor Electronics. The following year, Data Display, Inc., was organized by former ERA officials. General Magnetics started in 1959 as a brainchild of ERA staffers. In the 1960s, restless ERA executives left to form Comserv, Analysts International, Telex, Whitehall Electronics, Electro Med, Comten, Flo-Tronics, Nuclear Data, Data Management, Theratron, Minneapolis Scien-

tific Controls, Aries Corp., Tronchemics Research, United Software and Community Electronics. Such Twin Cities-based companies as Data Card and Data 100 can trace their roots back to the ERA organization. And from the companies formed by that original group, other firms have split into a third generation, such as Cray Research.

In addition to Control Data and Univac, another major factor in the computer business today is Honeywell Inc. Honeywell entered the computer business in 1955 through a joint venture with Raytheon in a company called Datamatic. In 1970 the firm acquired the computer business of General Electric Corp which made Honeywell, at the time, second in size in the computer industry after IBM. Most of Honeywell's computer production facilities are located outside Minnesota in Massachusetts, Phoenix, Ariz., and Tampa and St. Petersburg, Fla. Even IBM, which from its Armon,, N.Y., headquarters, took away Minnesota's hope of being the computer capital of the world, eventually constructed a large computer facility at Rochester, Minn., employing about 5,000 highly skilled workers.

Because IBM decided to spread its computer plants throughout the world instead of concentrating them in one location, Minnesota today still is among the top states in computer production. Only California has more workers in the computer industry than Minnesota.

Of the world's top five computer manufacturers, four of them—IBM, Honeywell, Sperry Univac and Control Data—are either headquartered in Minnesota or have huge facilities here. There are more than 100 electronics-related firms based in Minnesota, with about 80 devoting most of their efforts to computers.

One of the more important aspects of the computer industry to Minnesota's business health is that it's an all-new category since World War II, and a badly needed replacement for the diminishing lumbering, flour milling and iron ore industries which built the state. The computer business is also a highly desirable industry in these days of worry about pollution and the drain on natural resources. It's a brain industry with a clean image, and it adds high quality people to the state's important work force.

As one industry executive says, "The computer industry has done more for Minnesota's self-image, in the quality of life area, than the Guthrie Theater and the Mayo Clinic put together."

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Don W. Larson, native Minnesotan, has been a close observer of the business community in the state for more than 30 years, both as a news writer and a businessman himself. Formerly publisher and editor of Corporate Report magazine, a regional business periodical, Larson was among a small group of entrepreneurs who took the nearly bankrupt magazine and within a few years turned it around into a highly successful monthly publication. For a dozen years he was business and financial editor of the St. Paul Dispatch and Pioneer Press, and during part of that time was the Minnesota correspondent for the Wall Street Journal. A past president of the Minnesota Press Club, Larson has been involved in journalism, mostly in the state, since his days as a cub reporter on the Mankato Free Press back in the late 1940s. Born in 1929 in Alexandria, Minn., Larson is now senior editor of Corporate Report and, in addition, publishes a regional business newsletter.