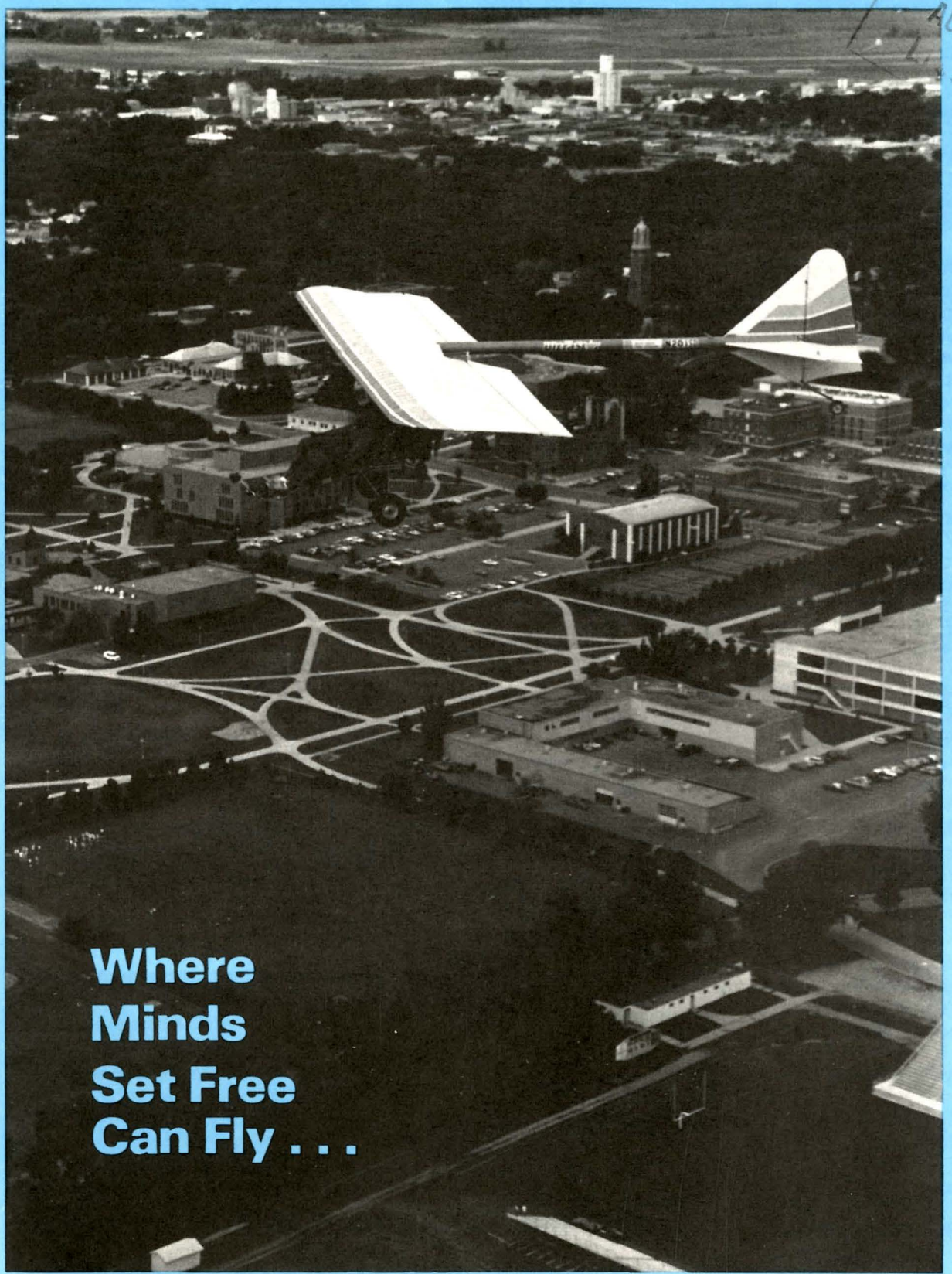
A DYNAMIC FORCE THAT INITIATES MOTION TO A BODY OR SYSTEM AUGUST 1987

IMPULSE AT STATE



SOUTH DAKOTA STATE UNIVERSITY

SDSU's engineering talent reflects excellence


Wagner


Koepsell

The mark of an outstanding college and university is the strength of the individuals who provide leadership, perform teaching, research and extension activities, serve as employees and enroll as students. In all these counts, the College of Engineering has demonstrated an excellence which reflects positively on South Dakota State University.

Dean Ernest Buckley has been asked by Gov. George Mickelson to join the Governor's Office of Economic Development as a special assistant for economic development, particularly as it relates to high technology industries and education's role in furthering industrial development. Dean Buckley's selection speaks well of the confidence the governor has in him. SDSU is pleased to share the dean in this very important project. He will fill that position through December 31, 1987, with the option of continuing those duties for an additional 18 months.

The College of Engineering is fortunate to have competent, energetic administrators serving as department heads. From among those, Vice President Carol Peterson has selected Dr. Duane Sander to act as dean of the College of Engineering during Dean Buckley's sojourn in Pierre. As acting dean, Dr. Sander is fully responsible for the programmatic and fiscal management of the college. We are pleased that he has accepted this very important position.

Professor George H. Duffey, in the Department of Physics, was recognized at the May 2, 1987 commencement as an F.O. Butler recipient in recognition for excellent service in the areas of innovative and creative activity. This is an honor shared by a small number of faculty at our university each year.

Don Ufford, a May SDSU graduate, is the recipient of two major national fellowships recognizing him as one of the outstanding 1987 engineering graduates in the nation. In 1986 Ufford was singled out as the National Student Agricultural Engineer of the Year.

This year, as you already know, the SDSU College of Engineering was presented the National Society of Professional Engineers' top award recognizing the school for providing one of the best engineering educations in the country.

All of us at SDSU are proud of the College of Engineering's leadership, faculty, staff and students. Their achievements reflect positively on the college, on the university and on the engineering profession.

Robert T. Wagner
President
South Dakota State University

Koepsell named Teacher of Year

Paul Koepsell named Teacher of the Year for College of Engineering

Paul Koepsell, civil engineering professor at SDSU, has been named "Teacher of the Year" for the College of Engineering. He was selected by a vote of the students within the engineering academic college.

Koepsell has taught at SDSU since 1957. He earned his bachelor's degree in civil engineering at SDSU in 1952 and his master's degree in structural engineering at the University of Washington in 1954. From 1952-57, Koepsell served as a structural analyst for Boeing Airplane Co. and later received his doctorate in structural engineering from Oklahoma State University. A native of Canova, Koepsell served for many years as director of research and data processing at SDSU. He is a member of several scholastic honorary societies including Phi Kappa Phi, Tau Beta Pi and Pi Mu Epsilon.

COVER: The Kolb Ultrastar, an experimental aircraft constructed from a kit by SDSU engineering students as part of Project SORD (Student Originated Research and Design), makes a flight over the SDSU campus green with senior Terry Meink at the controls. See stories on pages 3, 4 and 5.

IMPULSE

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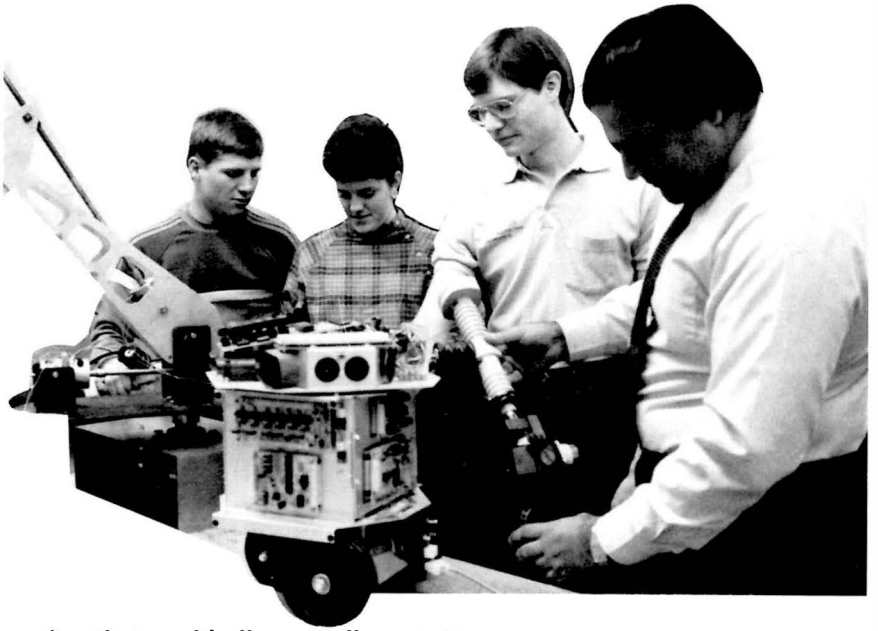
August 1987

SORD

Student Originated Research and Design projects give students practical experience in solving industrial design problems



SORD project students, from left, James Collins, Wood; Laura Stoltz, Marion; and Scott Dooley, Huron, work with Dr. Hamid Hamidzadeh, associate professor of mechanical engineering, to design a computer software program for a robotic arm.

In recent years industry has demanded economic and efficient production. Several years ago, the SDSU College of Engineering answered that need by initiating Project SORD (Student Originated Research and Design).

Originated by Dr. Ernest Buckley, dean of the College of Engineering, Project SORD responds to the need for more system design in industry, as well as in the private practice of engineering. According to Dr. Virgil Ellerbruch, project SORD coordinator and head of the Department of Electrical Engineering, the project brings together design concepts, such as robotics, being used today.

Ellerbruch says the project's primary purpose is to educate students in engineering design and secondarily to increase productivity in industry in the Midwest. A robotic arm constructed by students involved in SORD demonstrates, for example, the high degree of automation that could allow small-scale manufacturers to assemble parts more efficiently.

The students involved with SORD do all the design work to solve practical industry problems. "It gives them the connection between design problems and practical applications. It's one thing to talk about a problem, but it means a lot more if a student gets directly involved."

Current projects include the robotic arm, as well as an ultralight airplane, an automatic welder and a fuel efficiency vehicle system.

A digital computer is used in each of the projects. The Prime 750 computer, which has the software for Computer Aided Design/Computer Assisted Manufacturing (CAD/CAM), increases the students' design capabilities.

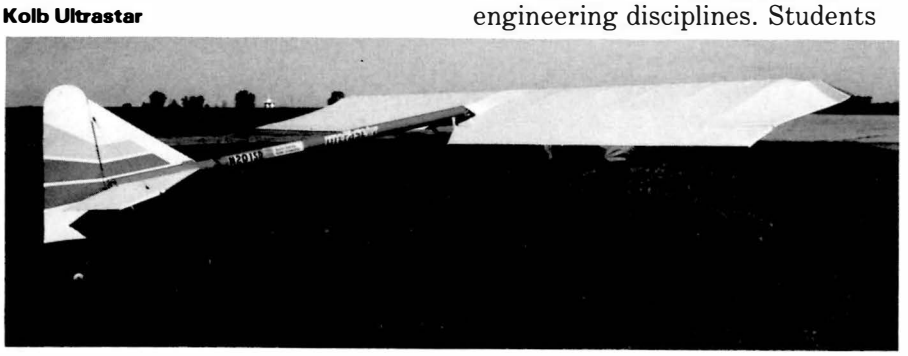
More than one dozen students worked on SORD projects last semester in design teams made up of students from the different engineering disciplines. Students from other science disciplines, such as computer science, have worked on the SORD projects, as well. The students are required to write a final report and also give an oral presentation.

Ellerbruch says, "The goals of the program are being met because we have ongoing projects that last more than one semester and even more than one year. There are teams of engineers from different disciplines designing the systems, and there's interaction with industries within the area."

Project SORD was initiated when the Accreditation Board of Engineering Technology started requiring more design work in all branches of engineering at universities throughout the nation.

Ellerbruch says more design is necessary in industry to meet the nation's need for efficient and economic production. Robotics and advanced automation have become more important because of the need for less costly labor. These industry changes relate back to the engineering schools, and the SORD project offers SDSU engineering students "hands on" experience at solving design problems for industry.

Kolb Ultrastar



Dreams take wing with SORD

Steve Turner and Troy Meink may be able to see a dream take wings and fly this summer.

If all goes well, the two SDSU mechanical engineering students will have the experimental aircraft that College of Engineering students have been designing for the past three years airworthy by August.

Potential uses for the aircraft range from agricultural spraying to military surveillance to recreational activity.

Turner, a native of Glenham and current resident of Volga, has been with the project since its beginning in the fall of 1984. Meink, who is from Lemmon, started in spring 1987. Turner was graduated from SDSU in May 1987, and Meink will graduate in May 1988.

The aircraft, SORD 1A, also has gone through the hands of about 24 junior and senior engineering design students and about 30 freshman and sophomore students who did construction work.

SORD stands for the Student Originated Research and Design program that gives engineering students hands-on experience through research and design projects. The 1A signifies that it is the first aircraft designed.

The College of Engineering also has a second aircraft that students constructed from a kit. The aircraft, called the Kolb (for the manufacturer) Ultrastar, is also an experimental aircraft. The Kolb Ultrastar was certified by the Federal Aviation Administration this spring as airworthy. The initial reason behind buying the kit was to use it as a construction project and as an engineering testbed. Funding for the kit was donated as a gift.

But the SORD 1A, because it was completely designed and constructed by engineering students, is special. SORD 1A weighs about 300 pounds, 50 pounds over the maximum that an ultralight utility aircraft can weigh. The FAA has labeled it and its counterpart from the kit, which also weighs more than 250 pounds, as experimental aircraft, not ultralights.

In order to do aerobatics like loops and rolls, the SORD 1A needed the additional strength of an experimental aircraft. The aircraft will be able to fly at about 70 miles per hour, a speed that exceeds the capabilities of an ultralight.

The SORD 1A, from the tip of the tail to the front of the prop, measures 16 feet, says Turner. Each wing is 12 feet long, four feet wide and weighs 36 pounds. The wings are made of Styrofoam and common wood like pine, carefully selected of a fine and straight grain with no knots. If the plane were manufactured for sale, Turner estimates it would sell at about $8,000.

The fledgling flight of SORD 1A will mean the conclusion of one chapter in its development and the opening of many others.

"Once we get the airplane flying, it's going to be a testbed for a lot of projects," says Meink.

Although both engineering students agree that the plane's most likely use will be recreational, they also can envision its application in agricultural or military areas.

A farmer who is a licensed pilot could put spray attachments on the aircraft and spray his land for possibly one-fourth the cost of hiring someone to do it, Turner says. The farmer could not spray on property other than his own unless licensed to do so.

A remote control system would allow SORD 1A to be programmed to automatic pilot. Spraying a field with the aircraft in remote control would probably be too difficult, says Turner, because the irregularity of the land would hinder the plane's ability to spray evenly.

An automatic wing leveling feature, however, would let the pilot relax at the controls, and the plane, says Turner, would "basically fly itself."

Surveillance applications also are being considered. Remote control would make it possible to monitor radioactive sites like Chernobyl (the Russian nuclear plant that leaked radioactive substances into the atmosphere following an explosion at the plant) without endangering a pilot's life.

SORD 1A could be used to further aerodynamic research. The aircraft could sense remotely and

transmit back information like air speed, engine power and climb rates, Meink says.

Electronics surveying of a remote area could generate a computerized contour plot of the land.

Farmers could use the craft to survey crops and check livestock.

An infrared video attachment could produce information like crop moisture content.

Turner and Meink say the project is open to involvement from all of the engineering disciplines. For example, electrical engineering students will design an electrical system for the aircraft, as well as remote control and automatic pilot components. Mechanical and civil engineers will analyze the craft's structure and possibly design a two-seater. Agricultural engineers could study the possibility of adding spray attachments and bulk chemical applicators to the plane.

If the plane is certified to fly in August, Meink and Turner, both certified pilots, plan to take it to the world's biggest airshow in Oshkosh, Wisc. Turner says approximately 20,000 planes will be at the show. "Ideally, we'd like to fly it out there," he says, "but we probably won't be certified."

Before the plane can be certified by the FAA, a 40-hour test flight period is required. Meink says extensive ground testing will take place before the aircraft ever moves through the air.

Both men say they trust their work. And in any case, the aircraft is equipped with a ballistic parachute that is capable of bringing the entire aircraft down safely if an emergency arises in the air.

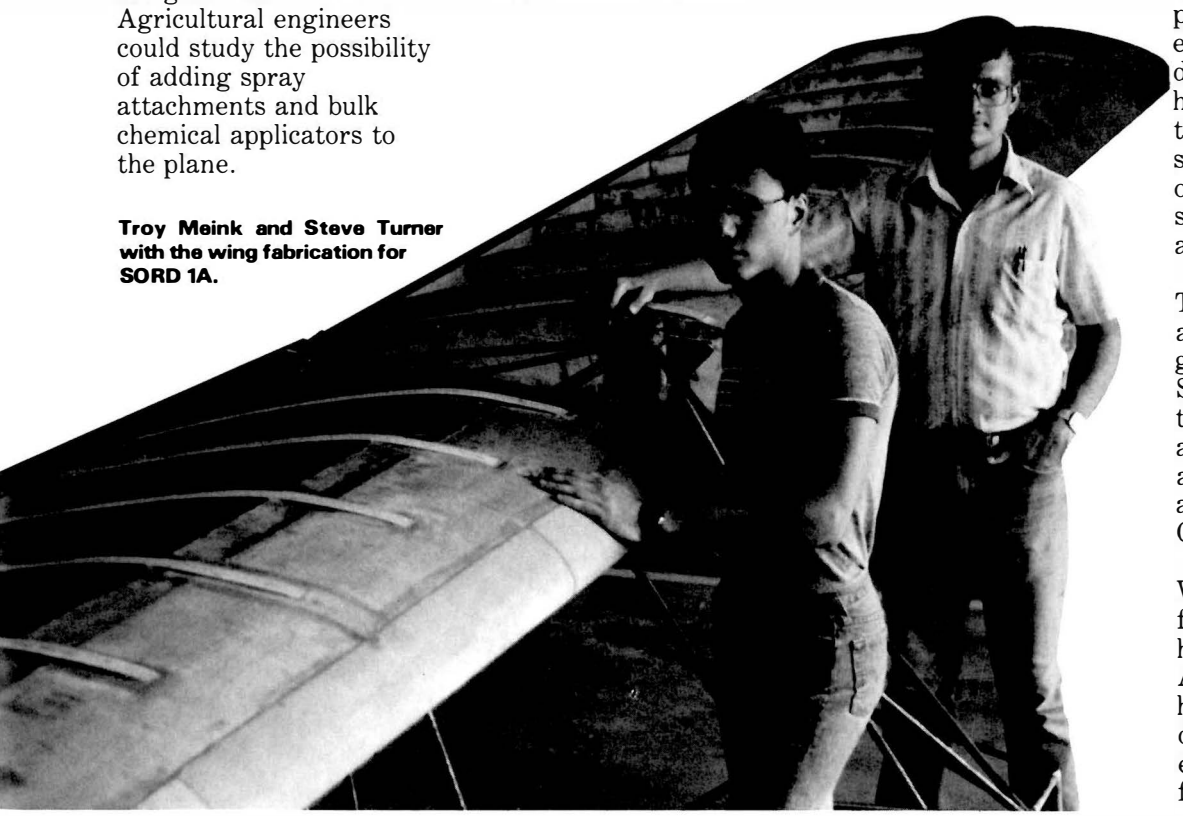
Turner and Meink say their summer plans for the aircraft include finishing the fuselage (the plane's frame), mounting the engine, putting in the controls and covering the plane with a standard aircraft fabric.

Next fall, Turner will begin a graduate assistantship in aeronautical engineering at National Aeronautics and Space Administration (NASA)/Langley, through George Washington University in Hampton, Va. He plans to specialize in aircraft design.

"SDSU's been pretty good to me," he says. "This project greatly enhanced my education." Turner had wanted to pursue a degree in aeronautical engineering, but was unable to go out-of-state to enter a program. When he came instead to SDSU, he was able to work in the SORD program and obtain experience with aircraft design. "The program here helped me get into the NASA program," he says. The NASA program only accepts about 10-15 students each year in the aeronautical program.

Turner received an associate degree in general agriculture from SDSU in 1977. Following that, he farmed for a year and then taught industrial arts for a year in Selby and three years in Glenham.

When Meink graduates from SDSU in May 1988, he plans to "fly for the Air Force." After that, he may pursue a master's degree in aeronautical engineering and work in flight test engineering.



Troy Meink and Steve Turner with the wing fabrication for SORD 1A.

Higher education and industry work together for economic development

Don Ufford, Vermillion, chairman of Impact '87

Mary Knudson, senior ME from LaCrosse, Wisc., chairperson of Engineering Exploration Day in 1988

SDSU was the junction point for business and education in South Dakota, April 24-25.

Impact '87, sponsored by the SDSU College of Engineering, the Industry and Commerce Association of South Dakota and the Governor's Office of Economic Development, was an event designed to demonstrate how higher education and industry can be partners working together for economic development in South Dakota.

William Norris, who spoke at the Distinguished Engineers Banquet held during Impact '87, praised the fair at SDSU as a step in the right direction to help solve technological problems. Norris is chairman emeritus of Control Data Corp.

Gov. George Mickelson, who has been in the forefront of South Dakota's drive to become economically sound through industrial and educational development, said in a letter sent to 30,000 people: "Impact '87 is the first of its kind in the state and the first in an annual series of trade fairs planned for enhancing economic development through education."

The two-day, student-organized event offered more than 40 professional development seminars, as well as programs for high school and college students. Besides seminars that focused on careers, high school students could compete in engineering contests to design and build bridges, paper airplanes, egg-dropping packages, a rat-trap vehicle, a marble maze and a newspaper tower.

Professional development seminars focused on economic development, business management, agriculture and science and technology.

Approximately 80 booths displayed exhibits from the state's six public colleges and commercial exhibitors, including manufacturers, utility companies, government agencies, professional practitioners and cooperatives from across the country.

Approximately 26 were student booths. Projects like robotic devices, a livestock tank liner and experimental aircraft were displayed. A demonstration and design contest brought in entries like a quick hitch and a portable tractive effort instrument.

About 15 nationally-known exhibitors had booths in Impact '87, including Daktronics Inc., the Brookings firm that makes olympic-class scoreboards and timing devices.

Michael Hart, left, Chandler, Minn., Guy Napier, Northfield, Minn., and Don Ufford, Vermillion, won first place for their design entry, the quick hitch, in the Impact '87 Design and Demonstration Contest.

An extension of Impact '87 was the dedication of the Brookings Economic Development Center (EDC), a small business incubator created to help give fledgling businesses a boost toward economic success. Prominent leaders including George Mickelson, governor of South Dakota, Jim Abdnor, former U.S. senator and current head of the U.S. Small Business Administration, and Robert Wagner, president of SDSU, were on hand to participate in the dedication.

The Entrepreneur Awards for two top small business plans written and presented by SDSU students and sponsored by Daktronics, Inc., of Brookings, and an essay award sponsored by Raven Industries, Inc., that included an internship at the company's Sioux Falls plant, also were presented during the dedication of the EDC.

A Partnership Ball and a Distinguished Engineer Awards Banquet were held in conjunction with Impact '87 and helped to further emphasize the theme of the trade fair, "education enhancing economic development."

Don Ufford, 1987 engineering graduate from Vermillion and general chairperson for the trade fair, says the fair effectively highlighted the partnership between business and education in South Dakota and promoted economic development in the state.

Impact '87 was an off-shoot of Engineering Exploration Days held each year at SDSU. Last year each of the state's six public colleges and universities joined the SDSU College of Engineering to produce "techsigns," a computer trade fair and conference. "Techsigns" earned a 1987 creative programing award from the National University Continuing Education Association.

Gov. George Mickelson has said he plans to make the trade fairs an annual event. Next year's trade fair will be held at the School of Mines and Technology in Rapid City, says Ufford.

Lower left photo: Terrance Harms, left, Chester, and Joe Pawlovich, Huron, won first place for their demonstration on a physical bowl scorer in the Impact '87 Design and Demonstration Contest.

Top photo: Second place in the demonstration contest went to Sim Ong, left, and Soon Pil Ho, both Brookings, for their presentation on the treatment of drinking water by the ozone.

Lower right photo: Rahmad Djakaria, left, Brookings, Patrick Ellwein, Barnard, and Joe Stehly, Hecla, took third place for their demonstration on a livestock tank liner.

Engineering students sweep awards for small business ideas

A business risk undertaken three years ago by two SDSU engineering students has generated more than just business profits.

David Anderson, senior in electrical engineering, has won first place and $500 for his entry in the Entrepreneurship Awards Contest at SDSU. The contest was initiated this year by Daktronics, Inc., a Brookings-based firm that produces electronic display systems.

Anderson, a Lake Preston native, and his partner, Paul Mobley, a junior from Lake Preston, own and manage a business called Zephyr Audio Productions, a sound system and light show available for events like homecomings, proms or night entertainment in bars.

The winning plan calls for the expansion of Zephyr Audio Productions into a business that also provides equipment for existing or potential bands. The business also could handle booking procedures for bands on an exclusive contract basis.

Anderson, a pianist himself, says his business ambition grew from an earlier desire to be a member of a band, a dream that went no further due to his lack of funds. "I've seen a lot of kids in the same spot," Anderson says. "Kids can practice together, but they never become a real band, because they have no money to buy equipment."

Anderson's latest dream may help others to realize theirs. Band hopefuls that come to Zephyr Audio Productions are given three to four months practice time with Zephyr's equipment in a room rented by Zephyr for practice space and equipment storage. Anderson and Mobley then attempt to book them professional jobs.

Second place winners in the Daktronics Entrepreneurship Awards Contest were David Bjorneberg, senior in agricultural engineering from Garretson, and Sam Schaefer, a graduate student in ag engineering from Sioux Falls. Bjorneberg and Schaefer won $250 for their plan to market an instrument called the transiometer, through their potential firm, B & S Company. The transiometer originated from a need to investigate water movement in highly impermeable soils and measures soil moisture flux, according to the two planners.

The two top small business plans were among three of six chosen to be presented before a committee organized to work with the students and judge the awards.

David Anderson, second from left, senior agricultural engineering student from Lake Preston, won first place in the Entreneurship Awards Contest. The award was presented at the dedication of the Brookings Economic Development Center. Also on hand were, from left, Jim Abdnor, head of the U.S. Small Business Administration, Gov. George Mickelson, Dr. Aelred Kurtenbach, president of Daktronics, Inc., and Dr. Robert Wagner, president of SDSU.

Sam Schaefer, left, graduate student from Sioux Falls, and David Bjorneberg, senior from Garretson, earned second place and $250 in the Entrepreneurship Awards Contest. Regg Glawe, below left, graduate student from Arlington, was a finalist in the contest.

The third plan presented belonged to Regg Glawe, SDSU agricultural engineering graduate student from Arlington. Glawe's presentation focused on marketing the Skidtric, an electric loader designed by the Agricultural Engineering Department at SDSU.

Other plans submitted for the entrepreneurship contest included one from Paul Knecht, senior in journalism from Hoven, for Alpha Education, a business designed to provide a letter-writing service to school-age students to improve their language skills.

Grant Washnok, sophomore in agricultural from Le Roy, Ill., produced a plan for ALPS (Assistance for Life, Production and Self), a company that would market items like specially designed clothing to handicapped individuals and would depend on government agencies and special-interest groups to invest in its growth.

Kip Mueller, a junior in agriculture from Rapid City, created a plan for K and M Manufacturing, a company that would produce revolving Christmas tree stands to be marketed for about $60.

SDSU alumni honored as distinguished engineers

Junis O. Storry, Brookings, and Delbert M. Leppke, formerly of Wecota, have been named Distinguished Engineers by the College of Engineering at SDSU. They were honored for dedication to engineering at the annual Distinguished Engineer Awards Banquet, April 25, in conjunction with Impact '87.

Leppke received his bachelor of science degree in electrical engineering from SDSU in 1951 after serving in the U.S. Army Signal Corps. He graduated with highest honors.

After graduation, Leppke became involved in the emerging nuclear power industry. Under a fellowship from the Atomic Energy Commission he attended Oak Ridge School of Reactor Technology and in 1952 joined the Chicago consulting firm of Pioneer Service & Engineering Co. There he was responsible for developing nuclear power plant design capability.

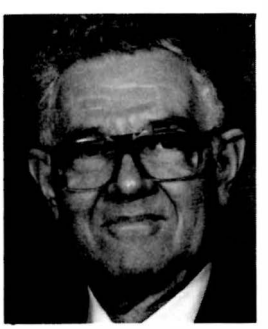
The Fluor Corp., a worldwide engineering, construction and natural resources firm, acquired Pioneer in 1974. By then Leppke was serving as senior vice president. He was one of the principal consultants in the design of five nuclear power plants and the world's largest municipal water filtration plant. As senior technical manager at Fluor's Chicago office, Leppke's work now focuses on advanced technology for electric power generation. His office deals with environmentally acceptable ways to utilize coal as fuel.

Leppke has held offices in the American Nuclear Society, the Western Society of Engineers and the Illinois Society of Professional Engineers.

Storry, an Astoria native, received his bachelor of science degree in electrical engineering from SDSU in 1942. Prior to joining the SDSU faculty in 1946, Storry worked for the Westinghouse graduate training program, handling ignitron rectifiers and automatic switchgear.

He completed his master's degree in electrical engineering at SDSU in 1949 and he received his doctorate from Iowa State University in 1967. Storry advanced to the rank of full professor and served as SDSU's College of Engineering dean for 10 years, retiring in 1982. Storry helped found SDSU's Center for Power Systems Studies, an off-shoot of the Electrical Engineering department involved with research and scholarships.

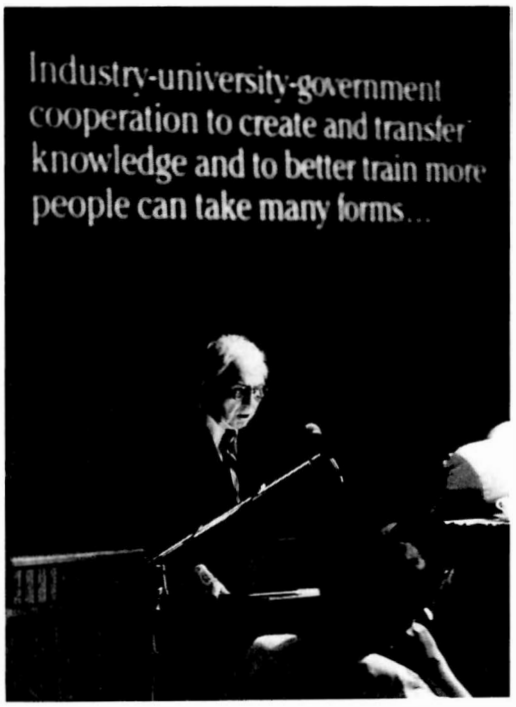
Storry remains active in the Institute of Electronic and Electrical Engineers, the Lions Club and the South Dakota Engineering Society.



Leppke
Storry

Solving the technological illiteracy probl

Control Data founder calls for expansion of computer-base



The United States must expand significantly its system of computer-based education and training if it is to continue to create new jobs and maintain its share of world markets. The future of the nation depends on it, said William C. Norris, chairman emeritus of Control Data Corp., in a speech at the Distinguished Engineers Banquet, April 25, at SDSU.

Norris founded Control Data in 1957 and is considered a pioneer in the development of computer technology.

He says a comprehensive approach must be used for economic development and job creation.

"First, there must be a vast increase in technological cooperation to more efficiently use our nation's scarce resources to expand innovation in order to stem and then reverse the serious decline under way of U.S. competitiveness in world markets," said Norris. "In industry after industry, we are losing world market share. Even in high technology industries, we have lost market share in 7 out of 10 sectors.

"The second premise is that emphasis must be placed on assisting the small business sector, because it is the major source of new jobs, and assisting the family farm because of its critical importance to nonmetropolitan area economies.

"The...last premise is that new institutions must be established to facilitate technological cooperation. The modern world calls for the kind of cooperation and collaboration we've never had before, and our institutions are not set up to do it."

In an interview before his speech, Norris said that despite great advancements in the past 30 years, our nation is still technologically ignorant, so there are significant roadblocks to such cooperation.

"In our 'what-have-you-done-for-me-lately society,' it's hard to get the commitment."

He said the kind of cooperation he is suggesting is reflected in the new Business and Technology Center in Brookings, the so-called incubator center. It is a joint project utilizing public, private and community resources.

He also praised Impact '87 at SDSU as a step in the right direction to help solve the technological illiteracy problem.

Norris also discussed recent calls for legislation to protect U.S. companies from foreign competition.

He said Control Data Corp. has had a bumpy last few years because of unfair competition.

"The Japanese had complete access to our market and they could come over here and cut the hell out of the price and we couldn't return the favor. We have to insist that other countries provide equivalent access to their markets. That's not protectionism; that's equity of access.

"If we accept $10 billion in automobile imports, they ought to take $5 billion in imports from us," he said.

Norris said most of the opposition to trade legislation comes from economists who argue that it is contrary to the free market concept.

em

d education and training

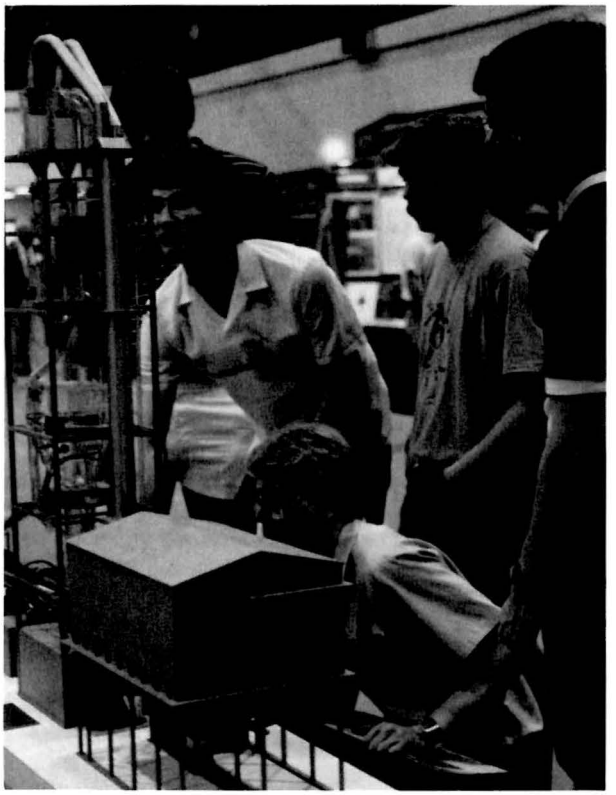
"They refuse to acknowledge that we don't have a free market today."

Norris suggested that other countries, and especially the Japanese, should help us pay for technological research.

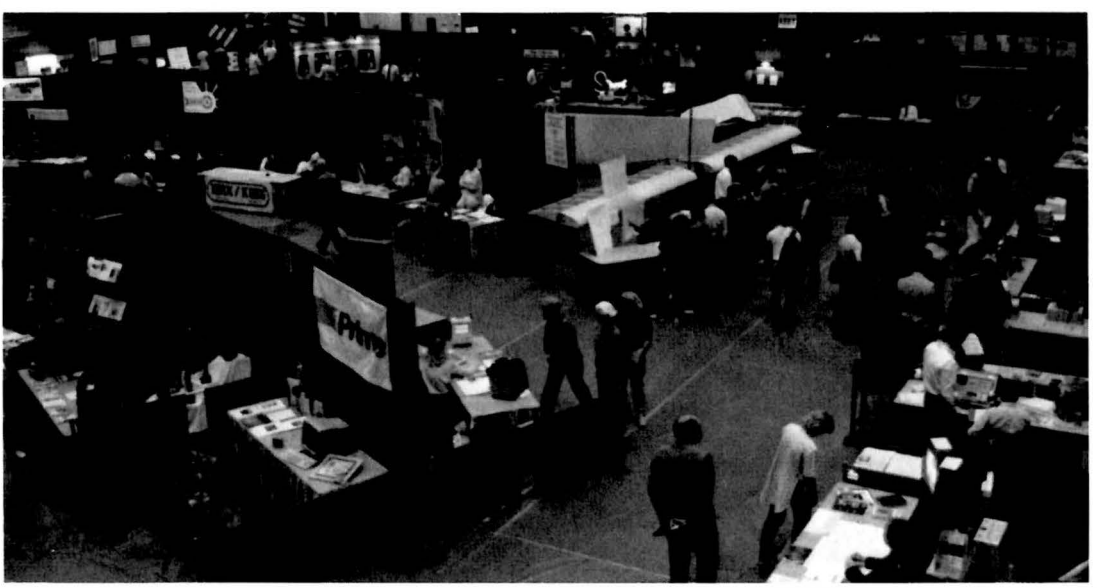
"The Japanese and everyone else have free access to our technology. They take a lot of it back with them. They ought to pay a goodly part of the research."

Control Data has several contracts on the Strategic Defense Initiative, or Star Wars.

"My own personal judgment is that we should help pursue Star Wars, but at a slower pace," said Norris.



The approximately 80 booths at Impact '87, April 24-25 at SDSU, included 26 student exhibits and 15 nationally-known exhibitors.



Project supervisor for Statue of Liberty restoration now introducing SDSU students to the challenges of architectural designing

From Miss Liberty to Lemmon

Whether it is Lady Liberty or Lemmon, S.D., Bruce Grulke uses his architectural talents to make improvements.

Grulke joined the College of Engineering staff last fall and is responsible for the development of SDSU's pre-architecture program. Before coming to SDSU, he was the project architect for the Statue of Liberty restoration in preparation for its 100-year anniversary celebration last July. Grulke first headed the renovation of the concessions and administration buildings on Liberty Island and then was asked by the Statue of Liberty/Ellis Island Foundation to be project supervisor, as well.

Now he teaches SDSU students through "hands-on" experience in architectural design.

During the past year Grulke and nine SDSU pre-architecture students have worked with Lemmon residents to provide ideas for enclosing one end of the town's main street, creating a mall-like structure.

Grulke says Lemmon's initial decision to tackle the project began with the possibility of a geodesic dome that would cover part of main street. Those plans crumbled when planners were presented with construction figures that stretched into the millions.

More recently, the students and Grulke offered three different alternatives at lower cost figures. The latest plans also afford Lemmon the possibility of keeping much of the money spent on the construction project in the area. Relying on "home-grown labor" and native materials could save up to or more than $1 million. A conventional structure (one built by an outside firm using its materials) could tally a bill of about $1.5 million. Each of three plans on the table now would cost between $400,000 and $500,000, if native assets are utilized, says Grulke.

Grulke's students have learned from the project, and the city of Lemmon has benefited. The class has provided Lemmon with conceptual models of the plans. "The models are professional; they won't get a better model," Grulke says. They may have gotten more complete drawings from a professional architect, but a professional also would have asked for at least $5,000 up front.

Grulke says the three plans offer different methods of capping the one-block long enclosure but will utilize the same floor plan. Two center rows of columns will support the roof. Each column will have a hollow center that will be heated at the top to prevent ice build up and to provide drainage for the roof.

Grulke is initiating plans for further campus-based community service projects like Lemmon's "We're seeking grant money from the federal government, and the SDSU Alumni Association is helping us go after private donation money to establish a Cooperative Design Center (CDC)," he says.

"This program would have an immediate impact on the Lemmon project. It would allow the CDC to purchase release time for mechanical engineering staff to help design a coal-fired heating system for the structure and for civil engineering staff to provide the final design for the structural connector plates for the space frame (if the city planners choose that plan)."

The CDC, Grulke says, would be a clearing house and an information center for merging student work and professional expertise to help solve real world problems in South Dakota, especially focusing on industrial needs.

Grulke and his students also have worked with the city of Redfield to help provide solutions for redeveloping its main street after a Nov. 16 fire destroyed much of it. The class also has drawn plans for a new Prairie Repertory Theatre in Madison and for rehabilitating downtown alleys in Brookings.

Students in Grulke's "Architectural Design" class who have worked on the Lemmon project include Allen Bartell, Conde; Eugene Beckwith and Gene Dilts, Wagner; Brian Shoon, Slayton, Minn.; Dan Jackson, Winterset, Iowa; Shawn Meyer, Ree Heights; Jason Galindo, Sioux Falls; and Mark Salter, Parker.

Grulke received a bachelor's degree in architecture from Ohio State University in 1976 and his master's degree from the University of California—Berkeley in 1980. His projects have included designing a $13 million, 110,000-foot television broadcast center for a New York architectural firm. But, he says, working on the Statue of Liberty for a year and a half tops his list of achievements.

As supervisor, Grulke worked with "punch lists." If a contractor announced that a job had been finished, the Statue of Liberty/Ellis Island Foundation directed Grulke to go in and check the work. "So you'd have to go through and look at every single item, and make a list, a punch list," he says. Frequently Grulke had contractors redo work. "I just basically, day by day, answered the questions or solved the problems," he says.

Grulke often haggled with different unions...like iron workers, painters, sheet metal workers. "And you'd have those scuffles between the different unions, who were saying, 'No, no, no. This is my work.' So a lot of the time, what I ended up having to do was to say who should get the job," Grulke says.

Even donations caused problems. "Somebody wanted to donate ice machines. I found out that we had an eight-foot high ceiling and the ice machines were nine feet high," Grulke says. Taking the donation meant changing all the drawings.

Winter added more problems. Concrete couldn't be poured. Icebergs floated into the bay during February and March. "Instead of taking 15 minutes (to get to the island), it took 45 minutes, because you had to stop every time. It was like playing asteroids."

Grulke says he and others often felt as though the different problems tied their hands and slowed progress. Despite that, Grulke says that toward the end of the project he felt he'd done something "of great importance."

"One couldn't be an egotistical person and do this, I don't think. Because when I was finished, this was an historic addition. It looked like it had been there since the very beginning. All the massing of the building, the details of the building were all consistent with what was existing. So when it was all over, if I had done my job right, you'd look at it and it would look like we hadn't done anything."

Going back after the celebration ended was difficult for Grulke. "It wasn't really until the fifth and the sixth of July, when I went back, that I realized that the people who were there weren't looking at the little things—you know, the little things that I'd look at. This doesn't align here...this brick is chipped there...this stone is broken there and has to be replaced. But I was thinking everything had to be perfect. That's my job."

Environmental Research and EROS sign agreement

SDSU's Engineering & Environmental Research Center (EERC) has signed an agreement for cooperation with Eros Data Center and the U.S. Geological Survey. The agreement provides for cooperation so that each may benefit from the other's strengths in the areas of basic and applied research projects in training and education, according to LaDell Swiden, EERC acting director at SDSU.

"It is a benefit of the university to have access to state of the art expertise," says Swiden. "It's a benefit to our teaching mission to be able to consult . . . (Eros Data Center)."

The purpose of the agreement is to enhance the efforts of both organizations in the areas of advancing techniques of data collection, analysis, and display and to assist public agencies, private enterprises, international organizations and academia in employing digital image processing, geographic information systems and remote sensing, nationally and internationally.

Areas of cooperation include training opportunities for students, such as internships and thesis projects. Also stated in the agreement are plans for developing joint basic and applied research projects and joint educational activities including exchange programs. Cooperation in the use of facilities, hardware and software also are expected, says Swiden.

SDSU astrophysics researcher using computer simulation to explore the heavens

Dr. Joel Rauber, 29-year-old assistant professor of physics at SDSU, is exploring uncharted territories.

The National Science Foundation (NSF), a division of the federal government that oversees government support of basic research in the sciences, has awarded Rauber a $50,640 grant to study astrophysics—specifically, what the result would be of the collision of two spinning black holes in space.

Rauber hopes to complete his research through computer simulation of colliding black holes, enormously dense yet invisible objects believed to be in outer space. A high-speed computer system bought with $20,000 of the NSF grant may lead him to some of the answers physicists seek.

"The last 15 years," Rauber says, "have witnessed an explosion of work in the field of computer simulation of astronomical events." Rauber will use the mathematical equations of Albert Einstein's theory of gravity to simulate collisions. "These are the mathematical equations that control or govern the motion of objects," says Rauber.

Rauber's work is basically part of an ongoing scientific effort to understand nature. "The benefits of technology in our society have come about because in previous generations scientists were curious about nature and asked questions. Future technological benefits will arise from basic science research."

The practical application of basic science research is not always evident at first, Rauber says. "Wilhelm Roentgen, the German physicist, was not looking for X-rays. He was trying to answer some questions about nature and accidentally discovered X-rays."

A problem of interest in astrophysics, the study of physical phenomena in the heavens, is to determine the gravitational radiation (waves) produced by collisions of compact objects like black holes.

"It's implicit in Einstein's theory of gravity that black holes exist," Rauber says. Einstein's theory predicts the existence of natural phenomena that have been detected, increasing the likelihood that his theory's other predictions, like black holes, are also accurate.

If a collision occurred, the Einstein theory predicts that gravitational waves, waves that transport energy, would result. Rauber wants his research to disclose how much and what kinds of gravitational waves might result. That information would be relevant to scientists working to detect the extraordinarily weak waves.

If a detector is ever created that is capable of discerning gravitational waves, scientists could use the results of his research to study the waves, says Rauber. Detectors are being used, but no waves have been detected yet.

Additionally, Rauber says, if gravitational waves were better understood, they could be used to develop an observational tool like a telescope. "Then, if we detect an object radiating waves like what a spinning black hole might produce, we could guess that object is a black hole."

Doing basic research in South Dakota is necessary in order to have a viable system of higher education in the state, Rauber says.

The expertise Rauber gains working on this problem can later be directed to other problems, even if his research is not successful. "I'm trying to do something that has never been done before. It might not work."

Rauber graduated with a B.S. in physics from Emory University, Atlanta, Ga., in 1978. He received his Ph.D. in physics from the University of North Carolina, Chapel Hill, in 1985. He teaches introductory and advanced physics courses at SDSU.

Buckley 'on loan' to Economic Development

Dr. Ernest Buckley, dean of the SDSU College of Engineering, has been granted a leave of absence to work as a special adviser on job creation, science and technology for the Governor's Office of Economic Development in Pierre.

Buckley will be "on loan" from SDSU beginning June 1 until the end of 1987, and possibly longer. He will work to assist in implementing plans developed while he earlier served as a special consultant on economic development from November 1986 through January 1987.

Buckley says he reviewed the organization of the economic development efforts of the state of South Dakota, as well as the office's goals and how institutions of higher education could be involved in the state's economic development plan.

According to Gov. George Mickelson, Buckley now will be assisting to implement the recommendations and changes made earlier, specifically, putting together job development programs that emphasize research and development and higher education.

SDSU President Robert Wagner says, "this is a great opportunity for SDSU to serve the governor's office and the state of South Dakota." Although Buckley's services as dean will be missed, says Wagner, the potential for the entire state with his direct involvement in economic development is substantial.

"Dean Buckley has a strong background in industry and education and we welcome the opportunity to further share his expertise with the state of South Dakota," Wagner adds.

Buckley became dean of the SDSU College of Engineering in 1983 after spending 15 years in the aerospace industry and 13 years in higher education in Texas. He also has experience in the construction industry.

He was named Engineer of the Year in 1986 by the South Dakota Engineering Society and was honored as a Distinguished Engineer by the SDSU College of Engineering in 1980 in recognition of his contributions to the engineering profession.

Buckley

Sander

Sander fills in as acting dean of Engineering

Dr. Duane Sander, head of the General Engineering Department at SDSU, has been named acting dean of the College of Engineering, to serve while Dr. Ernest Buckley is on loan to the Economic Development office in Pierre.

Sander joined the SDSU faculty in 1968 as an associate professor of electrical engineering and became a full professor in 1975. He was named director of Engineering, Extension and Development in 1984 and head of the General Engineering Department in 1986.

He has authored or co-authored more than 15 publications and was a co-founder of Daktronics, Inc., a Brookings-based business that manufactures and distributes sports scoreboards internationally.

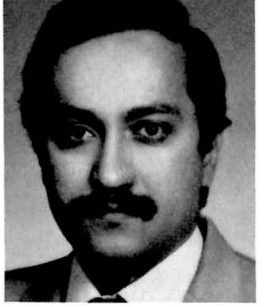
Sander received his bachelor's degree in electrical engineering from South Dakota School of Mines in 1960. He earned his master's and Ph.D. degrees from Iowa State University.

Prior to coming to SDSU Sander worked at the U.S. Army Foreign Science and Technology Center in Washington, D.C., as an intelligence analyst. He has taught at Iowa State University and has worked as an engineering counselor for Sen. Larry Pressler.

He is a member of the Institute of Electrical and Electronics Engineers, National Society of Professional Engineers, Rocky Mountain Bioengineering Symposium and the Association for the Advancement of Medical Instrumentation.


Duffey


Knabach


Nikpur


Moore

Nikpur and Moore to join engineering faculty

Dr. Kamyar Nikpur will join the staff of the SDSU College of Engineering this fall as a visiting associate professor of mechanical engineering. His responsibilities will include teaching kinematics and dynamics of machinery, design of machine elements and fracture mechanics.

Nikpur received his master's degree in applied mechanics from the Imperial College of Science and Technology, London, in 1973, and his Ph.D. from the same college in 1978.

From 1979 to 1986, Nikpur taught basic and advanced courses in strength of materials, theory of elasticity, fracture mechanics, dynamics, machine design and other courses at Tehran University of Engineering and Technology in Iran. Since 1986, he has been a visiting professor at Washington University in St. Louis.

Dr. Donald Moore will join the SDSU Electrical Engineering Department fall semester as an associate professor, tentatively teaching Electronics I.

Moore comes to SDSU from Memphis State University in Tennessee where he has been teaching and doing graduate work in applied mathematics and computer science.

He earned his bachelor's degrees in math and physics in 1942 from the University of Nebraska-Lincoln. In 1948 he received his Ph.D. in physics from the University of California.

Moore has taught at the University of Nebraska, University of California and Rensselaer Polytechnic Institute. He served as dean at Housatonic Community College, Bridgeport, Conn., and as dean of faculty at Otero Junior College, LaJunta Colorado.

He also has served as a research physicist for Standard Oil Company and Schlumberger Well Service, as a research geophysicist for Bendix Field Engineering and as a technical adviser for the Anglican Diocese of Southern Malawi in Africa.

Knabach reappointed to state commission

Wayne Knabach, SDSU electrical engineering professor, has been reappointed to the South Dakota State Electrical Commission by Gov. George Mickelson. Knabach first was appointed by former Gov. Richard Kneip in 1977 and has served on the commission since.

The responsiblities of the seven-member commission include establishing the minimum standards for electrical wiring, examining and licensing electricians, electrical contractors and inspectors within the state and inspecting and approving new wiring.

Duffey one of five to receive F.O. Butler Award

Dr. George H. Duffey, professor of physics, is one of five faculty members at SDSU selected to receive the 1986 F.O. Butler Faculty Award for exceptional individual achievements. Duffey's award recognizes him for Excellence in Innovative and Creative Activity.

The annual $500 cash awards are given to recognize performance, talent and achievement in teaching, research, extension, community and student service and creative activity among SDSU faculty and staff. Recipients were honored during commencement ceremonies May 2 at SDSU.

Duffey, a native of Manchester, Iowa, and current SDSU physics professor, has served SDSU a total of 41 years. Fourteen of those years were as a faculty member in the Chemistry Department with the remainder in the Physics Department. During that time he has had three books and more than 30 articles published. One of these books was translated into Spanish and Japanese and was used widely throughout the world.

For many years Duffey was considered one of the leaders in the fields of boron chemistry and group theoretical application to molecular bonding. He has contributed several books in these fields and is currently working on a book in graduate quantum mechanics.

Manning honored for design work with dry-type transformer

In the mid 1940's, Dr. Melvin Manning, Brookings, became the father of the dry-type transformer, an electrical distribution product designed to be fire and explosion resistant. Modifications of his design, the 220 degrees centigrade dry-type transformer, have appeared over the years and today, in the United States alone, companies spend more than $300 million a year on them.

Manning, dean of the SDSU College of Engineering from 1959-66 and professor of electrical engineering from 1966 until 1972, recently was honored by the Institute of Electrical and Electronics Engineers (IEEE) Transformer Committee for his contributions to the field of electrical engineering, particularly his work with transformers.

Manning, now 86, was on hand at the IEEE Transformer Committee meeting this spring in Fort Lauderdale, Fl., where he was honored with a special program and a plaque recognizing his work, before approximately 200 leading power engineers from the U.S., Switzerland, Germany, England and other countries. The committee cited the knowledge, time and effort required for Manning's development of the dry-type transformer and for his work as an educator.

Recognition for Manning's expertise has come not only from the IEEE Transformer Committee but also from *IEEE Electrical Insulation Magazine,* which will be publishing articles written by Manning in its July, August and September issues.

Manning, a consultant for the Keene Corporation Laminates Division, graduated from SDSU in 1927 with a B.S. in electrical engineering. He received his M.S. in electrical engineering from the University of Pittsburgh, in 1932 and his honorary doctorate in engineering from SDSU in 1978.

Myers named professor emeritus of engineering

Victor I. Myers, longtime professor of agricultural engineering and former director of the Remote Sensing Institute (RSI) at SDSU, has been named professor emeritus of agricultural engineering by the South Dakota Board of Regents.

Myers served as director of the RSI for 16 years before his retirement in 1985. During this time he played an integral role in the successful implementation of remote sensing projects at the local, state, federal and international levels. The Visiting International Scientist Program, which provides remote sensing training to scientists from around the world, also was established during his tenure at SDSU.

Before coming to SDSU he served as a civil engineer for the Soil Conservation Service (SCS), U.S. Department of Agriculture, Idaho; as a hydraulic engineer for the SCS; as associate professor, hydrologist and experiment station irrigationist for the University of Idaho; as agricultural engineer and project manager for the USDA in Reno, Nev.; and as director and research investigations leader of remote sensing at Weslaco, Texas.

In 1982 Myers received an honorary doctor of science degree from the University of Idaho. His work has involved him in international projects in such countries as Egypt, Syria, India and Spain and he has authored or co-authored more than 80 publications.

Top photos, left, Najla Ghazi, junior broadcast journalism major at SDSU and daughter of Dr. Hassan Ghazi, right, head of the Mechanical Engineering Department, is the newly crowned Miss South Dakota 1987. She competed as Miss SDSU.

Manning

Myers

Phonathon Engineering Exposition Experience '88

Student engineering groups set major projects for 1987-88

SDSU's Joint Engineering Council (JEC) has traditional as well as many new projects facing it this year.

In these days of budget cuts, the importance of the phonathon must be recognized. The equipment donations replace lab inventories which are often outdated. But the purpose of the engineering phonathon is more than to seek donations. Job leads and updating alumni on the college's activities are also important products of the event. Jim Angell, a senior agricultural engineer, will be the new coordinator for the annual phonathon.

This year's engineering exposition will focus mainly on high school students. It will introduce the engineering profession to them through seminars, contests and exhibits. Mary Knudson, a senior mechanical engineer, is the exposition's coordinator.

One of the most exciting projects facing the Joint Engineering Council is Experience '88. The program was started on a small scale last year. Sophomore through senior level students can apply to spend their spring break with sponsoring engineering firms and companies. The students will accompany an engineer for a week. This will give them an idea of the type of work they will be doing upon completion of their degrees. Companies stress that professional experience provides valuable insights for future engineers, and companies benefit by being exposed to these upcoming graduates. New companies are always needed to offer on-the-job experience to our students.

For the first time, three JEC officers will represent SDSU at the National Engineering Student Council Conference at Columbia University, New York, N.Y. The agenda will focus on seminars featuring leadership skills and speakers from Fortune 500 companies.

My personal goals for the Joint Enginering Council are pointed at gaining more exposure for our organization in 1987-88. I hope to accomplish this through improved visibility of, not only the JEC, but also of the student chapter of the National Society of Professional Engineers (NSPE) at SDSU.

The entire chapter is looking forward to an exciting and productive year.

Richard Heitkamp
President, JEC and
NSPE student chapter

Heitkamp honored for service to engineering

Richard Heitkamp, Adrian, Minn. has been honored for service and involvement by the SDSU College of Engineering.

Heitkamp, who recently finished his junior year majoring in civil engineering, was presented the Dynamic Doer Award for his "unselfish and tireless efforts" in assisting with engineering activities, according to Dr. Ernest Buckley, dean of the college.

Heitkamp served as publicity chairman for the recent Impact '87, a two-day trade fair and professional development seminar program focusing on "education enhancing economic development."

Buckley cited Heitkamp for his "professional attitude and participation" in the American Society of Civil Engineers student chapter at SDSU, as well as the chapters of the National Society of Professional Engineers (NSPE) and the Joint Engineering Council at SDSU. "He is an example to the entire College of Engineering," Buckley says of Heitkamp.

Angell to chair fraternity group

Jim Angell, Elkton, Minn., has been elected president of SDSU's Interfraternity Council (IFC).

The IFC is the governing body of the five social fraternities and the two social sororities which compose the SDSU Greek system.

Angell is a senior agricultural engineering major. He is a member of Alpha Gamma Rho fraternity, Joint Engineering Council, Dance for Dystrophy Committee and the Society of Professional Engineers.

SDSU student earns internship with Raven

A student from SDSU would like to lessen the wear and tear on farmers' bodies by decreasing the labor involved in emptying grain bins.

Jim Angell, who will be a senior in agricultural engineering at SDSU this fall, concocted a plan for using an inflatable bag in round storage bins to reduce manual labor. Angell put his plan on paper, entered it in an essay contest sponsored by Raven Industries, Inc., and won an internship for the summer at Raven's plant in Sioux Falls.

Angell, Elkton, Minn., is now working as a project engineer assistant for Raven, a company that produces scientific balloons and sealed plastic film and serves markets in aerospace, agriculture, construction, transportation, waste treatment, clothing, recreation and military applications.

If time permits, Angell says he may be able to construct a prototype of his idea while working at Raven this summer. The product, if a few bugs are worked out, is one Raven could market, Angell says.

Angell, who grew up on a swine and grain farm, calls his labor-saving device an aero-cone, an inflatable bag that when filled takes the shape of a cone. Grain, when leaving a bin, will slope into the shape of a cone.

Angell's inflated bag might delete the need for shoveling and sweep augers. The aero-cone would be placed at the bottom of the bin and would slowly inflate into the shape of a cone so the grain would flow to the center.

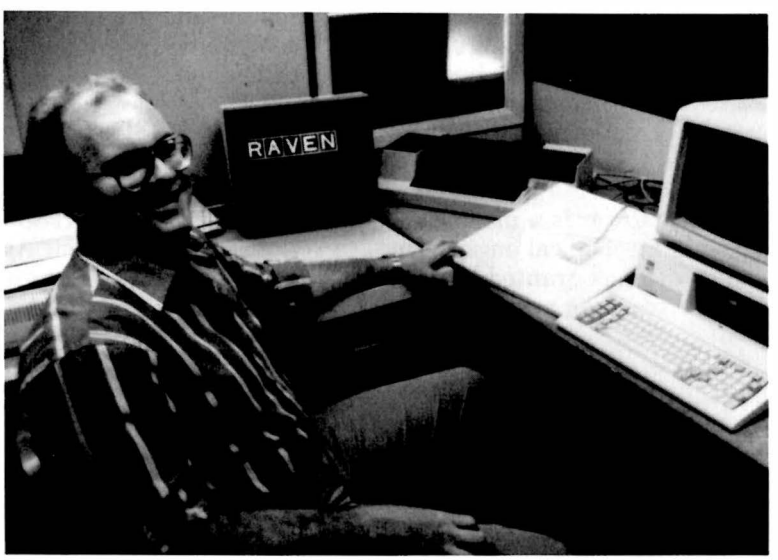
"The grain will actually be lifted up and forced to flow to the center of the bin," Angell says.
In most round grain bins a horizontal auger located at the bin's base takes the grain from the discharge hole, also at the base of the bin, to a slanted auger that transfers it to a truck.

Angell's decision to study agricultural engineering was based on a desire to produce better products for farmers.

"I know what it's like to be on the farm," he says. "There's a lot of backbreaking labor. I've seen bad products designed, and I want to be sure good products get designed."

Although Angell would someday like to be in a management engineering position, he says he would like to work with the design or re-design of machinery or structures after graduating from SDSU next spring.

This summer at Raven Industries, Inc., he is assisting with the re-design of a scientific balloon box into a reusable box. "We'd like to make a better quality box that could be shipped back," he says.



Student civil engineers receive national award

The SDSU chapter of the American Society of Civil Engineers is receiving a "Certificate of Commendation" from the National ASCE headquarters.

The honor is based on an evaluation of the annual student chapter report for its 1986 activities and reflects a number of years of outstanding activities and participation by the local chapter's more than 100 members.

SDSU's student chapter is involved with numerous community projects including planting trees and helping to rebuild the backstop at the Aurora Ballpark. In Brookings, students have built playground equipment at the Southbrook Softball Complex and have worked on preparing topographic maps of the Edgebrook Golf Course and the two city parks.

Dr. Dwayne Rollag is the head of the SDSU Civil Engineering Department, and Charles Tiltrum, associate professor of civil engineering, is the local ASCE student chapter adviser.

Chi Epsilon

Ten students at SDSU were inducted into Chi Epsilon national civil engineering honor society this spring. Chi Epsilon is dedicated to maintaining and promoting the status of civil engineering as an ideal profession.

New members to the society include James Bedessem, Brandon; Chee Kian Chai, Alan V.S. Chong, Hock Hwee Heng, Hock Eng Ker and Su Siong Pang, Brookings; Scott Schneider, Ipswich; Clair Budahl, Sioux Falls; Craig Glazier, Hastings, Minn.; and Craig Genzlinger, Maple Plain, Minn.

Pi Tau Sigma

SDSU's Pi Tau Sigma mechanical engineering honor society inducted six new members this spring. Pi Tau Sigma recognizes students for good academic records, good character and potential success in the engineering field.

Members inducted include Blake Seas, Brookings; Brian Parliament, Hayti; Scott Herrboldt, Sioux Falls; Lonnie Pederson, Sisseton; Bruce Hanen, Iowa Falls, Iowa; and Jon Ness, Kasson, Minn.

Sigma Pi Sigma

Six students at SDSU were inducted into Sigma Pi Sigma physics honor society this spring. To be eligible for the honor society, students must attain at least a 3.0 grade point average on a 4.0 scale, be majoring in physics or a related field, be ranked in the upper one third of their class and have completed three semesters of college work.

Students inducted into the honor society include Greg Bierman, Aberdeen William Baker, Theresa Binkley and Patrick Thies, Brookings; Timothy Ruggles, Watertown; and Lyle Johnson, Sibley, Iowa.

Phi Kappa Phi

Nine students from the College of Engineering are among 71 SDSU students and three faculty members elected to Phi Kappa Phi Honor Society, a campus-wide group which recognizes academic excellence.

Seniors elected into Phi Kappa Phi must rank in the top 10 percent of their class and juniors are required to be in the top five percent. Integrity, good character and academic achievement are considered.

Students elected this year from the College of Engineering are Mark Stahl, Bridgewater; Blake Seas, Brookings; Ken Neuharth, Eureka; Steven Harmon, Huron; Randall Mills, Lennox; Ralph Hagge, Menno; Michael Mueller, Parkston; Daryl Tapio, Watertown; and Lyle Johnson, Sibley, Iowa.

Mortar Board

Eight students from the College of Engineering are among 34 students recently initiated into the SDSU chapter of the Mortar Board national honor society.

To be initiated into the Mortar Board a student must rank in the top three percent of the SDSU junior class and exhibit leadership ability and community service. Members also are required to have a minimum grade average of 3.25 on a 4.0 scale.

The engineering students are Jim Bedessem, Brandon; Michelle Clauson and Philemon Mebrahtu, Brookings; Soraya Karim and Daryl Scholfield, Pierre; Lonnie Pederson, Sisseton; Daniel Berg, Pipestone, Minn.; and Mary Knudson, LaCrosse, Wis.

Ufford recognized as one of outstanding 1987 engineering graduates nationally

Don Ufford, Vermillion, has been awarded two major national fellowships recognizing him as one of the outstanding engineering graduates of 1987 nationally.

Ufford, who earned his bachelor's degree in agricultural engineering from SDSU in May, has been awarded fellowships from both national honor societies of Phi Kappa Phi and Tau Beta Pi. He will begin work this fall at Purdue University towards a master's degree in mechanical engineering. Purdue also has granted him a graduate teaching assistantship.

Ufford was one of 50 graduates nationally selected for the Phi Kappa Phi award from a group of 180 of the nation's outstanding 1987 college graduates.

Ufford's award from Tau Beta Pi, the national engineering honor society, is the Centennial Fellowship which honors the society's most outstanding fellow. He is one of 31 young engineers selected for graduate fellowships based on high scholarship, campus leadership and service and promise of future contributions to the engineering profession.

While at SDSU, Ufford maintained a perfect 4.0 grade point average, served as commencement speaker this spring and in 1986 was named the National Student Agricultural Engineer of the Year by the American Society of Agricultural Engineers (ASAE).

Ufford has held offices in the SDSU chapter of ASAE and this spring served as overall chairman of Impact '87.

Ufford has accepted the Phi Kappa Phi Fellowship without stipend.

1916

Warren D. Fish, (CE) honored in 1978 as an SDSU Distinguished Engineer, passed away in December 1985.

1923

Clarence A. Walseth (EE) is retired from The Chesapeake and Potomac Telephone Co. and lives in Richmond, Vir. He notes that the engineering phonathon is a very good idea and says, "the personal contact is enjoyable and gives a real good feeling of still belonging to State."

1930

Loys A. Johnson, (CE) is professor emeritus at the University of Florida and still works part time in the School of Building Construction as an adviser and consultant. He is living in Gainesville, Fla.

1931

Herman I. Berg (CE) lives in Fort Worth, Texas and has been retired for close to 17 years. He enjoys golf, bowling, Norwegian folk dancing and traveling and is teaching three Norwegian language classes.

Leo C. Koblas (EE) is retired as an electrical supervisor from Mare Island Naval Shipyard. He lives in Vallejo, Calif.

Sidney C. Larson (EE) lives in Minneapolis, Minn., and retired from teaching at the University of Minnesota in 1977. Prior to teaching, he was an adviser to the Electrical Engineering Department of Seoul National University and helped to rebuild the department following the Korean War. He also has been a consultant for many companies including Honeywell, Control Data, Boeing, Litton Industries and Bell Laboratories, Inc.

1943

Victor V. Nielson (EE) is living in Oceanside, Calif. He says, "SDSU must be proud of the record its engineering graduates make and they must be proud of SDSU."

1948

Lester Board (CE) is retired in Phoenix, Ariz., after 30 years in the U.S. Army.

1950

James Dowd (EE) is retired and living in Elephant Butte, N.M., after a career with AT&T Technologies. He says, "We credit SDSU for our very comfortable retirement."

1951

Craig E. Christie (ME) is living in Cedar Falls, Iowa, and works for John Deere.

1958

Richard Larson (ME), Ulster Park, N.Y., recently earned the President's Award from IRECO, which now owns the Hercules, Inc. plant where he has worked for the past 24 years. This award is presented annually to the employee who shows the most outstanding performance and service to the company.

1959

Duane D. Pederson (CE) retired from the U.S. Bureau of Reclamation in 1983, after 35 years of civil service. He lives in Othello, Wash.

1961

A.J. Van Dierendonck, (EE) is employed by Stanford Telecommunications, Inc., and lives in Los Altos, Calif. He is an expert on the navstar global positional system (GPS) and occasionally teaches seminars on the subject.

M. Jim Willard (mathematics) is working for Hewlett Packard and lives in Loveland, Colo.

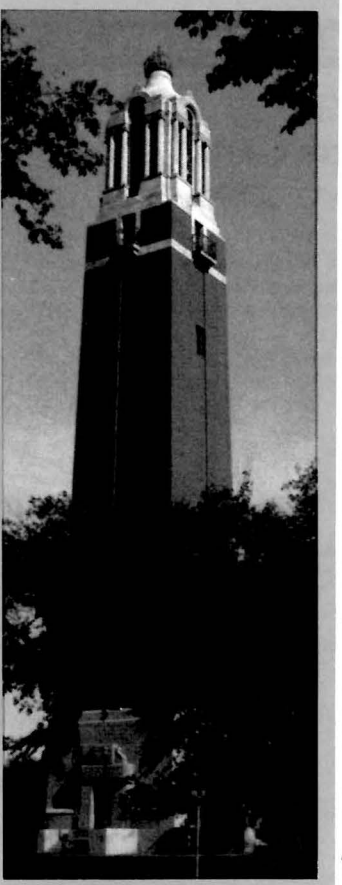
1963

Allan J. Block (CE) is currently living in Bedford, Texas, but plans to move to the Phoenix, Ariz., area within the next year.

Ellen Rasmussen (mathematics) is teaching in Cottage Grove, Ore.

1967

Lloyd E. Herbst (AE) is working for Herbst Construction, Inc., which is a highway contracting company. He lives in LeMars, Iowa.



The Coughlin Campanile is one of two SDSU landmarks recently named to the National Register of Historic Places. The campanile and its chimes were given to SDSU in 1929 by Charles L. Coughlin, a 1909 electrical engineering graduate, on the 20th anniversary of his graduation. His $75,000 donation included the 165-foot tower, sidewalk, beacon lights and floodlights. Also named to the National Register is the Coolidge Sylvan Theater constructed in 1927.

1970

Dick Suedkamp (CE) works for Ground Engineering Consultants, Inc., in Denver, Colo.

1971

David K. Palmer (EE) lives in Annandale, Va., and is stationed at Andrews Air Force Base. He says, "I sincerely hope that organizations and businesses will be attracted back to the Midwest. The bread basket has contributed so much to our country, and we dearly need people with the work ethics the Midwest breeds."

1972

Gary Lehtola (EE) is employed by the Collins Division of Rockwell International in Cedar Rapids, Iowa.

J. Tate Profilet (CE) works for P & M Steel Co. in Sioux Falls.

1973

Carole (Gilbertson) Lehtola (AE) is living in Alburnett, Iowa, where she says she is a "domestic engineer" with two children ages 5 and 7.

1977

Paul Trapp (EE) is living in Beaver Creek, Ohio.

1978

Lindsey K. Lien (CE) lives in Omaha, Neb., where she works for the U.S. Army Corps of Engineers.

1980

Kenneth Swanda (AE) lives in Pickstown, S.D., and works with the Corps of Engineers.

1983

Daryl Kirschenman (CE) lives in Minneota, Minn., and is employed by Bonestroo, Rosene, Anderlik and Assoc.

1984

Gregg Stedronsky (ME) works in St. Paul at Control Data in the environmental labs of the computer development division. Most of the work is on mainframe computer systems. Gregg feels that he has as good (or better) an engineering background as any of the engineers that he has worked with. "Thanks to SDSU for that."

CONTRIBUTORS
to the Greater State Fund
from Jan. 1 - June 1, 1987

Support from alumni has come to be essential to institutions of higher education. Contributions have made possible the developmental activities that have won recognition for the SDSU College of Engineering as one of the nation's leaders in engineering education. We have benefitted, and those who have been generous in their gifts share with us the satisfaction that comes from achievement.

BENEFACTORS

C. Milo Thelin, BSCE 1924, a senior engineer with the firm of Freese & Nichols, Consulting Engineers, and former Director of Public Works for the City of Fort Worth, Texas.

Dale Ryman, BSAE 1935 and BSCE 1938, national reputation in heavy construction specializing in freeways, now retired.

Lynn Seppala, BS Physics, 1968, currently resides in Pleasanton, Calif.

Steve M. Healy, BSME 1982, Contract Administrator with the H. L. Yoh Company out of Philadelphia, Penn.; resides in Newark, Del.

Gerald P. Ruden, BSME 1957. Owner of Delta Ford Truck Sales in Memphis, Tenn.

Albert & Ruth Kranzler. He received his BS in mathematics from the University of North Dakota in 1937 and his MS from the University of Minnesota in 1950. He taught in the Mathematics Department at SDSU for 42 years until retiring in 1981. Ruth received her BS in 1957 and her MS in 1959. She also is professor emeritus in child development.

SENIOR CENTURIONS OF THE SECOND CENTURY (Gifts of $200 to $999)

1922
Brinker, Charles S.
1924
Yule, Robert B.
1927
Barrette, Cecil E.
1928
Sundstrom, Raymond & Heler
1929
Stiles, Merrill R.
1931
Berg, Mr. & Mrs. Herman
Bue, K. Marvin
Lowe, William S.
1932
Craig, Donald E.
1933
Schulte, Mr. & Mrs. Herbert
1935
Berg, Ingolf
1938
Davis, Arthur H.
1939
Larson, Lorys J.
1942
Esmay, Merle L.
Owren, Harvey M.
1944
Brandt, Roy G.
1947
Buckley, Ernest L.
1948
Chamberlin, Charles H.
1949
Oleson, George H.
Knabach, Wayne E.
Willrodt, Marvin J.
1951
Berg, Arnold M.
1953
Miller, Roger A.
Woodworth, William
1956
Anderson, Harvey D.
1957
Vellenga, Mr. & Mrs. James
1958
Kramer, Mr. & Mrs. Dale V.
LaVallee, Ronald J.
Lohr, Jerome J.
1959
Holt, Alyn R.
1961
Bocklund, Jill L.
Christensen, Noel L.
DeLong, Mr. & Mrs. Max M.
Manwarren, Linda
Van Dierendonck, A. J.
Waggoner, Charles L.
1962
EerNisse, Errol P.
Ellingson, Ronald L.
1964
Wahlstrom, David A.
1965
Johnson, Gene A.
1966
Osmundson, Arthur
1967
Kanaan, Mahir M.
1968
Gamble, William L.
1972
Holton, Mr. & Mrs. Patrick
1975
Chen, Mr. & Mrs. Patrick
1976
Trygstad, Joan S.
1978
Kreyger, Craig E.
1979
Hagena, Gailyn D.
1983
Bocklund, Lori S.
Hagena, Gordon G.
1986
Lim, Boon Pock
Mangen, Lyle P.
Friends
Ellerbruch, Virgil G.
Finch, Robert
Hellickson, Mr. and Mrs. Mylo
Nordmark, Laura

ENGINEERING CENTURIONS (Gifts from $100 to $199)

1923
Anderson, M.
Ayers, Mrs. Richard
Walseth, Clarence A.
1925
Oleson, Mr. & Mrs. Calvin
1927
Gamble, Deda
1928
DeLong, Mr. & Mrs. Henry H.
1929
Hanly, Mr. & Mrs. Thomas
1930
Bjorklund, Mr. & Mrs. Elvin
Johnson, Loys A.
1931
Jepson, Hans G.
1936
Johnson, Stanford R.
1938
Reeve, R. A.
1940
Ordung, Philip F.
Webster, M. Keith & MaryJane
1941
English, Marvin L.
St. John, Roger B.
1942
Grace, Harold W.
1944
Chu, Mr. & Mrs. Shu T.
1948
Hall, Harold H.
Kohnke, Mr. & Mrs. Elton E.
Miller, Mr. & Mrs. Bruce
1949
Dornbush, Mr. & Mrs. James
Oviatt, Mr. & Mrs. Vinson
Severtson, Donald M.
Smith, Spencer R.
1950
Gilbert, Donald F.
Gillen, Lawrence J.
Olsen, George W.
1951
Beck, Billy R.
Bosshart, Harold P.
1952
Doering, Eugene J.
Fenner, Melvin F.
Koepsell, Paul L.
1953
Hanson, John M.
1956
Skjonsby, Rodney A.
1957
Sudman, Mr. & Mrs. Duane W.
1958
Kay, Mr. & Mrs. Robert C.
Nesheim, Willis L.
Trautman, Arthur D.
Van Eeckhout, Charles
1959
Sinnett, Richard C.
Soren, Ronald C.
1960
Dooley, Eugene N.
Hoff, Wallace J.
Mackey, F. W.
Todaro, Richard C.
VanDenBerg, Lowell & Nona
1961
Crossman, Mr. & Mrs. Leon
Silver, George L.
Sour, Larry G.
Wigdahl, A. G.
1962
Beckman, Mr. & Mrs. Richard
Proehl, Dieter W.
1963
Rakness, Warren L.
1964
Curtis, Mr. & Mrs. David R.
Druyvestein, Terry & Loretta
Hovey, Ronald S.
1965
Hayter, Mr. & Mrs. Richard
Johnson, Mr. & Mrs. David
Levins, Richard C.
1966
Keane, John F.
Mentele, James W.
Wangsness, Dennis
1967
Bartels, Mr. & Mrs. Keith
1968
Hagedorn, Mr. & Mrs. William
Isaak, Jerry J.
1969
Hauge, John D.
Johnson, Mr. & Mrs. Charles
Mullen, James J.
1970
Middleton, Glen D.
Satrang, Leroy V.
Suedkamp, Mr. & Mrs. Richard
1972
Lam, Mr. & Mrs. Hong-To
Busby, Robert W.
Corothers, James J.
Hovland, Warren G.
Tiltrum, Charles
1973
Haag, Mr. & Mrs. Gerald
Healy, William C.
1974
Firkins, Mr. & Mrs. Bruce
Potter, Richard & Vickie
1975
Sippel, Mark A.
Spilde, Daniel A.
1976
Shute, Gary M.
1977
Baker, George L.
Severson, Paul S.
1978
Baumberger, Patrick E.
DeYoung, Barbara G.
Hinrichs, Timothy L.
Hofland, Rick D.
Mahee, Sue E.
1979
Lentz, Scott J.
1980
Nachtigal, James G.
Neuse, Gerald
1981
Geraets, Lawrence J.
1982
Akland, Donald E.
Juntti, Charles E.
1983
Doeden, Craig A.
Hofer, Kent L.
Smith, Mr. & Mrs. Ernest
Ulrich, Scott D.
1984
Wahlstrom, Stuart A.
Styles, Jerald E. & Kathy
1986
Liebl, David A.

ALTRUISTIC ALUMNI (Gifts up to $99)

1920
Solberg, Harry L.
1922
Funk, Virgil C.
1925
Donabedian, Avedis H.
Jones, George K.
1927
Billman, Mr. & Mrs. Albert
Pinch, F. C.
1928
Foster, Mr. & Mrs. Raymond
Heinzen, Harry R.
Joseph, John A.
Miller, George C.
1930
Sparks, Estel A.
1931
Koblas, Leo
Larson, Sidney C.
Rempfer, Harvard C.
1932
Fromke, Fred A.
Mitchell, Robert D.
Pier, Mr. & Mrs. Donald C.
Rohde, Florence E.
Taylor, Martin L.
1933
Anderson, Richard D.
Cotton, L. Eugene
Fauquet, Raymond W.
Freeburg, Paul
Scott, Clara
1934
Adams, Mr. & Mrs. Burr E.
Dannenbring, Gareld G.
Johnson, Mr. & Mrs. Delwyn
Landdeck, Norbert E.
Miller, Melvin C.
Silberberger, Leon
1935
Hermanson, Ingram T.
Hoover, Robert G.
Miller, Kenneth W.
Phihal, Joseph A.
Sahs, Robert E.
1936
Francis, Albert D.
Kulish, Leonard F.
1937
Bentson, Robert J.
Eastby, Marcus S.
Herbert, Richard M.
Walseth, Tracy S.
1938
Bartling, Lawrence E.
Bonell, William H.
Davis, Arthur H.
Robinson, Jesse C.
Snethen, Elbert M.
Wiseman, Mr. & Mrs. Gordon
1939
Christoffersen, Lee
Ellingson, Paul E.
Lintvedt, Maynard G.
Riley, Francis C.
Roda, Vern A.
Welsh, Clifford N.
1940
Emmerich, James C.
Klosterman, Mr. & Mrs. Paul
Sisson, Mr. & Mrs. Lowell
Waltz, Rex P.
Williams, Perry W.
1941
Dirksen, Robert C.
Durland, John & Doris
Hodges, Mr. & Mrs. Lyle W.
Johnson, Herbert C.
Lien, Ray M.
Mernaugh, LeRoy J.
Mickelson, Tharral H.
Walin, Don R.
1942
Crothers, Milton H.
Dill, Everett C.
Fagrelius, Mr. & Mrs. Carl
Johnson, C. Robert
1943
Edwards, Eulys C.
Janett, Earl S.
Lothrop, Eugene H.
Malmstrom, Edward C.
Weidenbach, Donald
1944
Boyd, Ronald C.
Healy, Donald & Helen
Nielson, Victor V.
Sours, Donald T.
Windedahl, Wayne E.
Zettle, Eugene V.
1945
Baddeley, Mr. & Mrs. Robert
1946
Jacobson, Delbert G.
Miller, George E.
1947
Ardery, James E.
Case, Eugene H.
Nelsen, Robert
1948
Aisenbrey, Mr. & Mrs. Andrew
Anderson, Robert H.

Bentson, Ben R.
Board, Leslie C.
Brown, Harriet
Haag, Mr. & Mrs. Marvin
Hunt, Eugene B.
Rogness, Aaron N.
Wiersma, Frank

1949

Bol, Simon V.
Dyson, Mr. & Mrs. John D.
Eng, Donald V.
Fodness, Robert S.
Groseclose, William R.
Housiaux, Mr. & Mrs. Glenn
Johnson, Elliott B.
Loken, Vern D.
Lundquist, Charles A.
McLaughlin, Paul R.
Puncochar, Robert P.
Ruch, Maurice D.
Severtson, Donald M.
Simmons, Paul & Frances
Thomas, Mr. & Mrs. Loyl R.
Thompson, James W.
Western, Ralph

1950

Amdahl, Lowell D.
Beesley, George A.
Cooley, William N.
Coyle, George D.
Dale, Robert
Dempster, Marion K.
Dowd, James L.
Dyrdahl, Robert J.
Graham, Mr. & Mrs. Robert
Hawkins, Andrew J.
Huchendorf, Kenneth D.
Jacobson, Henry G.
Keeler, Harold L.
Kohen, Eugene M.
Leinbach, F. Harold & Ruth
Leslie, Kenneth G.
Lien, Neil C.
Mainz, Betty
Mills, Mr. & Mrs. Harvey E.
Nielson, Earl M.
Payne, Lloyd E.
Schaeffer, Mr. & Mrs. Marvin
Smith, Roger T.
Sundberg, Alvin G.
Whitaker, Emil A.
Wyland, Mr. & Mrs. James
Yrjanson, William A.

1951

Aslesen, Robert L.
Bies, John W.
Froseth, Willard D.
Leppke, Delbert M.
Lillibridge, Mr. & Mrs. Lyle
Mortensen, Audrey
Nordmark, Glenn
Peters, Wayne H.
Schwartz, Mr. & Mrs. Wendell
Westlund, Clarence A.
Wyman, Kenneth D.

1952

Borghard, William G.
Christie, Craig E.
Dylla, Anthony S.
Kerner, Mr. & Mrs. George
Larson, Mr. & Mrs. Eugene
Nelson, Kermit L.
Quickstad, La Ron G.
Schmidt, Lyle L.
Smith, James W.
Strobel, Kenneth E.
Tribuzi, Mr. & Mrs. Albert
Uthe, P. Michael
Wahlstrom, Mr. & Mrs. Donald
Wanstedt, Jack M.
Wheeler, Jay A.
Wilson, Richard K.

1953

Anderberg, Lester W.
Andersen, Robert W.
Bue, Richard C.
Lohr, George E.
Miner, Harlow & Carol
Motchenbacher, Curtis
Sexton, Mr. & Mrs. George
Soelzer, Ralph E.
Straw, Pamela A.
Wiedenman, Charrles

1954

Hartman, William F.
Hawley, George S.
Kidman, Bruce H.
Stout, James F.
Walker, Richard C.
Yetter, Mr. & Mrs. LeRoy

1955

Brosz, Donald & Pearl
Catton, Robert D.
Iverson, Norman M.
Ninneman, Gene A.
Papoutsis, Stanley K.
Patenode, George A.
Tobias, Thomas J.

1956

Brotsky, Robert & Eleda
Claggett, Bruce C.
Egan, Noel H.
Keating, Donald J.
Lee, Lloyd & Mildred
Monahan, Maurice & Patty
Nygaard, George M.
Ohman, Neil O.
Pedersen, Curtis O.
Prosser, Paul L.
Rowlands, Mary
Severson, Wayne J.
Simonson, Rodney S.

1957

Barnes, John C.
Brunke, Robert R.
Coddington, Richard & Eleanor
Eilts, Leonard G.
Hendricks, Charles J.
Hinderaker, Philip D.
Isaak, Mr. & Mrs. Merlyn
Johnson, Charles A.
Johnson, Neal C.
Olhausen, Dale D.
Smeins, Virgil Dean
Wiles, Mr. & Mrs. Robert A.
Zaiser, Gary L.
Bymers, Ronald J.
Davies, James D.
DeGroot, Glenn
Diepholz, Mr. & Mrs. Eugene
Easton, Howard F.
Eggen, Charles P.
Green, Ronald R.
Hentges, Virgil W.
Kastner, James R.
Larson, Kenneth E.
Liepa, Arnold
Melbourn, John T.
Peterson, Darcy E.
Pochon, Virgil L.
Reed, Mr. & Mrs. Charles
Schnarr, Clayton K.
Yotter, Richard F.

1959

Allender, John K.
Anderson, Frances
Anderson, Willard
Beckmann, Dietrich J.
Blesi, William P.
Bultena, John G.
Clemens, Darlo J.
Dahms, Mr. & Mrs. Arthur
Dam, N. James
Deily, Mr. & Mrs. Walter
Fejfar, Adolph
Fendrich, George W.
Fodness, Donald A.
Gunnare, Robert C.
Horstad, W. Burton
Jackson, Mr. & Mrs. Roy L.
Jones, Larry E.
Kirkpatrick, Wayne M.
LaBrie, John A.
Larson, Richard R.
Ottman, Arlen D.
Pedersen, Duane D.
Petersen, Leonard A.
Peterson, Dean W.
Peterson, Mr. & Mrs. John
Pope, Dale E.
Potter, Roland C.
Roske, Mr. & Mrs. Warren E.
Sater, John C.
Strain, David A.
Strohmeier, Richard F.
White, Darrell D.
Woodfork, Wayne M.
Yocom, Raymond R.
Zebarth, Mr. & Mrs. Roger
Zenk, Harland C.

1960

Anderson, Lee A.
Berg, Lyle L.
Bierbaum, Richard H.
Bierman, Ordean A.
Blizzard, Mr. & Mrs. C. R.
Brush, Robert J.
Buse, Richard L.
Christensen, Dennnis D.
Christenson, Helmer D.
Cummings, Duane B.
Elsasser, Thomas R.
Gillen, Joseph W.
Hoff, Wallace J.
Jensen, Mr. & Mrs. Roland
Kaiser, Melvin R.
Kappenman, Patrick W.
Kellen, Kenneth P.
Kirby, James F.
Klas, Delbert P.
Knudson, A. B.
Kohl, Vance L.
Kost, Robert A.
Lang, Donald J.
Lippert, Mr. & Mrs. George
McGregor, Lauren L.
Oster, Clarence C.
Prew, Duane T.
Rapp, Delvin G.
Schlaht, Lawrence
Schultz, Robert G.
Simunek, William J.
Smith, Craig D.
Smith, Larry J.
Starken, George M.
Stern, Wallace R.
Weaver, Thomas L.
Williams, Dennis R.

1961

Arp, C. Wayne
Crawford, Gerald A.
Dahms, Mr. & Mrs. Arthur L.
Daniels, David D.
DeLong, Max & Marilyn
Gorsuch, Robert R.
Haack, Dale A.
Hallenbeck, Edward M.
Haugen, Floyd M.
Hoscheid, Terrence G.
Isaak, Larry F.
Keating, John & Sandra
Kramer, Donald H.
McVay, James V.
Nereim, Allan F.
Neyhart, Peter W.
Pearson, William R.
Rieck, Harold P.
Seislove, George M.
Simon, John H.
Stoddard, James A.
Tagtow, Eugene A.
Tande, Paul R.
Tilstra, Cornelius F.
Torgerson, Mr. & Mrs. John
Vander Woude, James
Wichmann, James H.
Willard, Mr. & Mrs. M. Jim

1962

Eberlein, Mr. & Mrs. Delvin
Hill, Charles W.
Jensen, Volmer K.
Jungemann, Roger A.
Juttelstad, David L.
Miller, James A.
Miller, James M.
Musolf, Roger A.
Pedersen, Derald A.
Putnam, Richard W.
Schmidt, John A.
Sisk, Mr. & Mrs. Michael G.
Steffen, Roy A.
Swan, Aaron A.
Swiden, Mr. & Mrs. LaDell
Van Eldik, William D.
Winter, Mr. & Mrs. Marlyn
Wolles, Walter L.
Black, Allan J.

1963

Bollinger, Jacob D.
Day, Alvin D.
DeFoos, Roger L.
Folkerts, James C.
Foss, Charles H.
Hanson, Jon G.
Harris, David J.
Hembd, James A.
Jarf, John E.
Larson, Roy H.
McCracken, William
Nordstrom, Dennis L.
Peterson, Mr. & Mrs. Alan
Peterson, Arvid O.
Rasmussen, Ellen
Richter, Gerhard W.
Schmidt, Ronald D.
Stevens, Dale M.
Vig, Robert J.
Wieting, Mr. & Mrs. Charles
Witham, Lonnie G.

1964

Auer, George A.
Brosz, Delvin D.
Ditmar, Charles E.
Dwyer, James D.
Emouna, Sidney S.
Jones, Russell D.
Kruse, Cameron G.
Lockwood, Mr. & Mrs. Donald
Mittelstedt, Dennis & Sharon
Molohon, Thomas J.
Opland, Mr. & Mrs. Raymond
Raffety, Michael R.
Reimers, Dave L.
Rust, Richard E.
Schlimgen, William A.
Serreyn, Donald L.
Siverhus, Ardell V.
Tyler, Douglas

1965

Billars, James R.
Clark, Robery J.
Dalager, John A.
Fennig, David O.
Harms, Vernon R.
Harter, Richard
Jones, Roger L.
Lorenz, Kenneth & Jonslyn
Micheel, John H.
Monhardt, Richard J.
Nelson, Donald C.
Parrish, Paul E.
Rasmussen, Virgil A.
Rassel, Richard J.
Sauer, Val J.
Stanley, Gerald L.
Stoeckman, Dennis K.
Stubben, David & Gladys
Tekrony, Kenneth L.
Tofflemire, T. J.
Vandenhoek, Allen M.
Wagenaar, Loren B.
Williamson, Sidney P.
Wollman, Glen R.
Woods, Thomas M.

1966

Bryan, Mr. & Mrs. Berlyn L.
Bucks, Dale A.
DeVries, David H.
Engle, Roger M.
Etbauer, Wilbur & Joan S.
Foreman, Larry R.
Gorsett, Eugene M.
Hartmann, Gary L.
Hickey, Charles E.
Hausken, Terrence
Jorgensen, Donald G.
Kallesen, Douglas R.
Pieper, Wendeli J.
Porter, Gary L.
Sawinski, Richard S.
Snapp, Richard S.
Spahr, Ronald & Barbara
Stavig, Helen V.
Sundberg, Garald C.
Van Den Berg, Max E.
Voell, Anthony T.
Willmott, Harry W.

1967

Birznieks, Mr. & Mrs. Uldis
Cothern, Mr. & Mrs. Joseph
Dutcher, Robert G.
Flagstad, Mr. & Mrs. Bruce
Friedrich, William C.
Gaspar, Jerome J.
Haisch, William T.
Hejl, Frederick D.
Herbst, Mr. & Mrs. Lloyd
Hendrickson, Dean L.
Henry, Eugene A.
Janzen, Kenroy K.
Knapp, Mr. & Mrs. Harry J.
McCarl, Mr. & Mrs. Terry
Miller, Donald L.
Nelson, David C.
Nelson, Kenneth C.
Pedersen, Robert K.
Proehl, Klaus A.
Scott, Gary J.
Siegel, Jerry L.
Sigl, Arden B.
Thorsvold, Mr. & Mrs. Gordon

1968

Aho, James A.
Anderson, Mr. & Mrs. Byron
Bailey, Roger G.
Cutler, Mr. & Mrs. James
Elhoff, Charles R.
Folk, William J.
Gilbert, Carl F.
Haug, Wayne R.
Heeren, Jerome D.
Hesla, Mr. & Mrs. James P.
Hetager, John A.
Klosterbuer, Shirley F.
McCormick, James R.

1969

Boulais, Charles O.
Breyfogle, Earl P.
Danielson, James E.
DeBerg, David E.
Drefke, Neal D.
Ekanger, Theodore L.
Flannery, Gerald F.
Gillispie, John K.
Graber, Dennis W.
Karnitis, John V.
Lutter, David A.
Mastroianni, Joseph R.
Ochsner, David & Gloria
Pavlis, Mr. & Mrs. Roger
Pettigrew, Douglas D.
Phillips, Richard A.
Poppenga, Mr. & Mrs. Bernard
Rakness, Mr. & Mrs. Kerwin
Rewalt, Mr. & Mrs. James
Schricker, Joe H.
Schweitzer, Steven F.
Svanda, Richard A.
Thormodsgard, Paul & Eilene
Tschetter, Mr. & Mrs. Wesley
Vania, George B.

1970

Caldwell, Gordon M.
Casler, James G.
DeKraai, Arlo B.
Devine, Rodney J.
Fergen, Joseph M.
Gunderson, Larry P.
Hoppe, Paul D.
Jensen, Douglas C.
Morgan, Mr. & Mrs. James
Murra, Carl L.
Nonnemacher, Pamela
O Neal, William B.
Paulson, Virgil A.
Richards, Dennis L.
Roskens, Mr. & Mrs. James R.
Rothermel, Robert A.
Satrang, Leroy V.
Schultz, Steven H.
Senden, Joseph H.
Serreyn, David V.
Walstrom, Robert W.
Willard, Mr. & Mrs. David

1971

Benting, Gary M.
Bjerke, Daniel L.
Boettcher, Robert M.
Dais, Delbert D.
Demlo, Richard E.
Duffey, Mr. & Mrs. James
Espeset, Mr. & Mrs. Paul
Foreman, Mr. & Mrs. Craig
Gelderman, Charles & Joyce
Gisi, Andrew J.
Hagin, Terry L.
Hegge, Mr. & Mrs. Ronald
Hofer, Mr. & Mrs. Dallas L.
Hoffart, Victor L.
Iverson, James P.
Jongeling, Gregg E.
Johnson, Thomas W.
Larson, Mr. & Mrs. Darrell
Lovo, Mr. & Mrs. James V.
Palmer, David K.
Shelbourn, Mr. & Mrs. Joseph
Stadheim, David A.
Thomas, Mr. & Mrs. Melvin
Zender, Thomas E.
Wegehaupt, Lynn A.

1972

Arndt, James
Austin, Gerald P.
Balster, Galen W.
Bliss, Gary L.
Brinkman, Darwin & Nancy
Busse, Jan J.
Crawford, Robert W.
Danek, Gerald W.
Dangel, Michael D.
DeVries, Mary
Durick, Michael J.
Fedde, Mickiel P.
Flanagan, Stephen J.
Forest, Terry & Debara
Graf, Timothy P.
Graves, David M.
Green, Donald L.
Hall, Richard A.
Hicks, Robert P.
Holman, David E.
Jorgenson, Mr. & Mrs. Ken
Kub, Mr. & Mrs. Francis J.
Kuper, Orlin L.
Larson, Mr. & Mrs. Elwin
Miller, James A.
Olson, Norman L.
Quenzer, Harlan
Stofferahn, Terrance L.
Thelin, Thomas L.
Thomas, Ralph S.
Thomas, Roger W.
Ullom, Mr. & Mrs. Arthur J.
Voelzke, Mr. & Mrs. Vernon

1973

DeHaai, Alan J.
Deibert, Janice
Erickson, Ralph T.
Fritz, Gene S.
Goetz, Dale M.
Huffman, Lester E. & Vickie
Johnson, Terry D.
Keating, Mr. & Mrs. Timothy
Klein, Mr. & Mrs. Michael
Koehn, Rodney
Kuchenbeker, Linda
Lanz, Lavern W.
Manning, James D.
Meyer, Mr. & Mrs. Gregory
Morgan, Larry M.
Mutz, Roger K.
Nelson, Rodney L.
Phillips, Reuben D.
Pickart, Bryce J.
Plucker, Darrell A.
Profilet, Mr. & Mrs. J. Tate
Redman, Alan L.
Roling, John E.
Quissell, Steven A.
Schoen, Daniel N.
Thompson, Millard C.
Tomac, Donald D.
Trygstad, William J.
Weber, Raymond S.
Welch, Michael R.
Zoellner, Kenneth O.

1974

Bertsch, Roger J.
Bortnem, Mark A.
Brewer, Karen J.
Clarke, Joseph P.
Egan, Mr. & Mrs. Robert K.
Eide, Gary W.
Ellis, Thomas E.
Heig, H. G.
Jackson, Charles L.
Jensen, Lyle L.
Jewett, Mr. & Mrs. Randall
Kortan, Mr. & Mrs. David
Magee, Gregory L.
Otterby, Mr. & Mrs. Michael
Pratt, David H.
Renner, Robert C.
Rethke, John T.
Ruff, Donald G.
Sherman, William B.
Silver, Thomas L.
Staebell, William D.
Undem, Halvor A.
VanHattan, Richard L.
VanLiere, Darrel D.

1975

Alsaker, Mr. & Mrs. Dayton
Beste, Douglas D.
Bettmann, Martin C.
Bies, Charles M.
Bloemendaal, Brent J.
Brosz, Danny S.
Brunken, Charles H.
Dokken, Ronald L.
Endahl, Robert L.
Hemmer, Ronald J.
Jans, Dale A.
Jorenby, Howard L.
Klaassen, Curtis J.
Koepsell, Steven A.
Lange, Duane J.
Larsen, Floyd A.
Lindner, Ralph E.
McComish, Richard L.

ENGINEERING DEAN'S FUND

McNellis, Kerry J.
Mousel, Mr. & Mrs. Steven
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1976

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