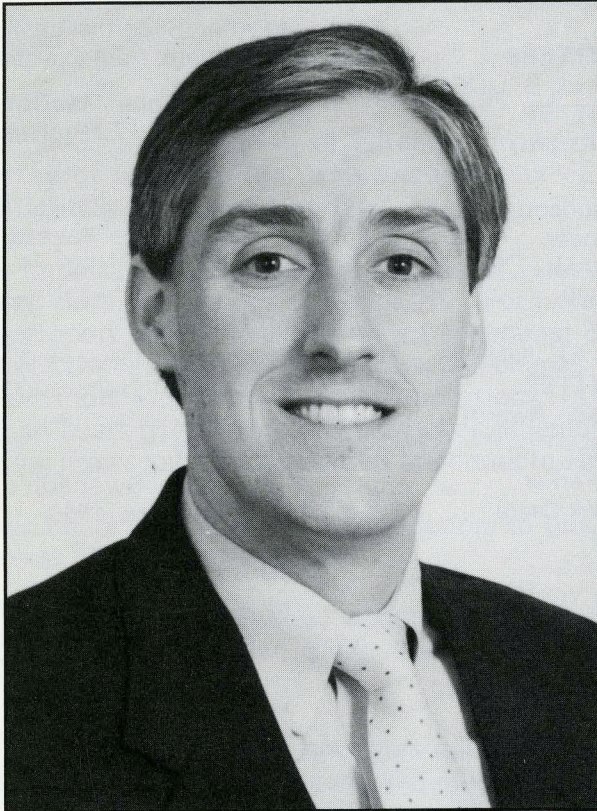
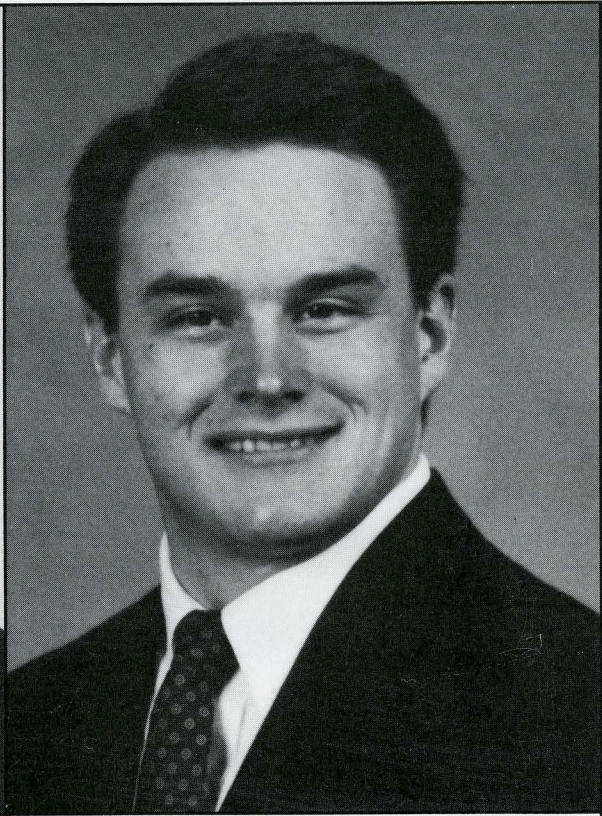




BRIDGE of Eta Kappa Nu



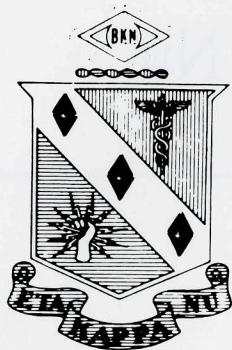
Dr. Barry W. Johnson
Outstanding EE Professor
Wins
C. Holmes MacDonald Award



Paul David Anderson
Outstanding EE Student
Wins
Alton B. Zerby Award

1991-92

WINNERS



Editor and Business Manager
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November 1992

Vol 89-No. 1

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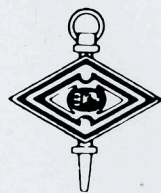
Marcus Dodson

Michelle Forster

Ed Hardy

Anthony Russell

George W. Swenson, Jr.



The BRIDGE is published by the Eta Kappa Nu Association, an electrical engineering honor society. Eta Kappa Nu was founded at the University of Illinois, Urbana, October 28, 1904, that those in the profession of electrical engineering, who, by their attainments in college or in practice, have manifested a deep interest and marked ability in their chosen life work, may be brought into closer union so as to foster a spirit of liberal culture in the engineering colleges and to mark in an outstanding manner those who, as students in electrical engineering, have conferred honor on their Alma Maters by distinguished scholarship activities, leadership and exemplary character and to help these students progress by association with alumni who have attained prominence.

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NOTICE

THE HKN

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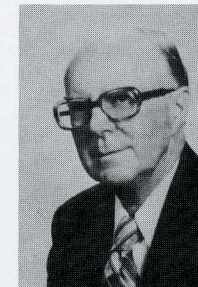
which includes a 2 year initial subscription to BRIDGE as determined in the 1991-92 HKN MAIL Convention

ETA KAPPA NU is pleased to announce the

PAUL K. HUDSON HKN DEVELOPMENT FUND

Paul K. Hudson
1916-1988

Eta Kappa Nu Executive Secretary
and BRIDGE Editor
1958-1988



Established by the Board of Directors in April 1992, this endowment fund will honor the memory of Paul Hudson, a devoted servant of HKN and a man who truly exemplified the qualities that "balance the bridge."

This important fund, managed by the HKN Board of Directors, will be used to support the general development of Eta Kappa Nu. For example, the fund will be used where necessary to help support HKN's national award programs; expansion, including the development of new college chapters and alumni chapters; and chapter visitations by current and past national officers and directors to assist with special occasions. All of these examples represent activities which Paul so heartily endorsed. Other developmental projects will be considered by the Board as funding grows and new objectives important to HKN become established.

As we honor Paul, we also honor donors to the fund by recognizing them as Paul K. Hudson Fellows. The categories are:

Distinguished Fellow: \$2000 and above
Sustaining Fellow: \$500 - \$999

Century Fellow: \$1000 - \$1999
Supporting Fellow: \$100 - \$499

Fellow: \$25 - \$99

Eta Kappa Nu invites its members and supporters to become a part of the Paul K. Hudson Development Fund by filling out and returning the form below.

I wish to become a Paul K. Hudson Fellow with a contribution of \$ _____

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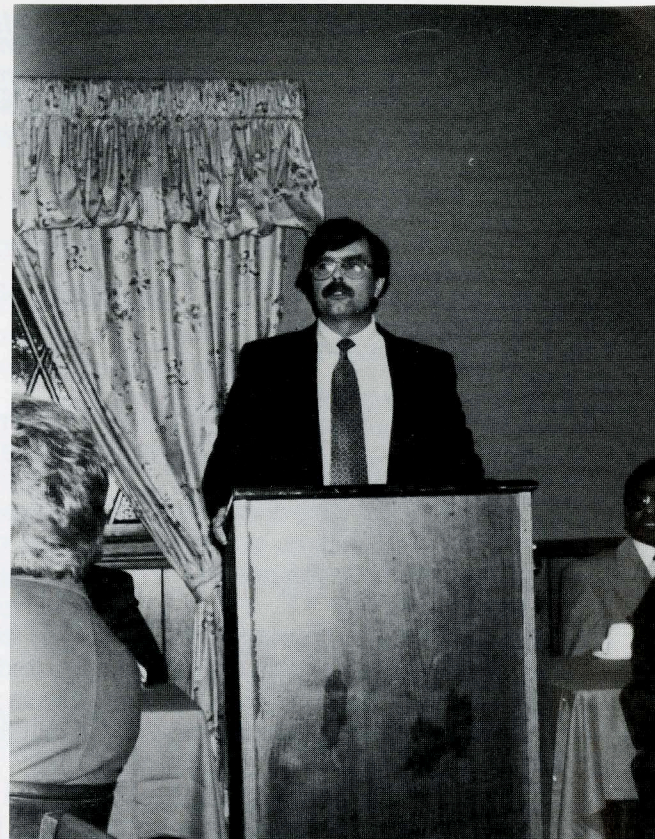
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Return to: Eta Kappa Nu International Headquarters
Box HKN
University of Missouri-Rolla
Rolla, Missouri 65401

Denice Rocca and Dr. James Richie receive awards at Marquette's Initiation Ceremony

by
Michelle Forster and Anthony Russell



Dr. Russell J. Niederjohn

On Sunday, March 22, 1992, the Marquette University Beta Omicron Chapter of Eta Kappa Nu held its spring initiation/awards banquet. The meeting began with a welcome and introduction by Bryan S. Behun, Chapter Vice President.

Following dinner, Dr. Russell J. Niederjohn Chapter Faculty Advisor, provided a brief history of Eta Kappa Nu. In addition, he congratulated all new initiates and thanked the outgoing officers for their fine job in support of the Marquette Chapter this year.

Next, Denice Rocca, a graduating senior, was presented a certificate as a result of being runner-up for the 1990-1991 Norman R. Carson Outstanding Junior Award. Dr. Mohammad Shahidehpour, Professor at the Illinois Institute of Technology (ITT), was on hand to present the certificate to Denice, recognizing her achievement. This award is administered by the Eta Kappa Nu Alumni Chapter of Austin, Texas, and is given to juniors who have good scholastic abilities and great leadership skills. Denice possesses both of these qualities. She has maintained a 3.9 GPA while serving as an officer in many honorary societies.

David Miller, President of the Beta Omicron Chapter, presented the Marquette University

Eta Kappa Nu Teaching Excellence Award to Dr. James E. Richie. Dr. Richie, an assistant professor, has been on the Marquette University Electrical and Computer Engineering faculty since August 1989. He teaches classes in electromagnetics and traveling wave theory. The Marquette University Eta Kappa Nu Teaching Excellence Award is presented to one faculty member each academic year.

Following the presentation of the awards, friends and family of the pledges were delighted and impressed by the pledge speeches and pledge class song. Each initiate was told the night before, after the initiation ceremony, that they would be expected to give a two to three minute speech on a topic dealing with electrical engineering. As usual, the pledge speeches were both informative and interesting to all in attendance. As evidence of this, many questions were asked by persons in attendance.

The spring initiates were: Michelle Forster, Brendan Keese, Kurt Lesser, Tomo Radojicic, Sajjad Salehmohamed, and Cathy Zeisler.

The meeting concluded with some closing remarks by Dr. Robert L. Reid, Dean of the Marquette University College of Engineering.



Photos: At top, Dr. Mohammad Shahidehpour, Illinois Institute of Technology, presents Runner-up Certificate, Norman R. Carson Outstanding EE Junior Award, to Denice M. Rocca; At bottom, Dr. James E. Richie makes some brief remarks following his receipt of the Chapter Teaching Excellence Award.



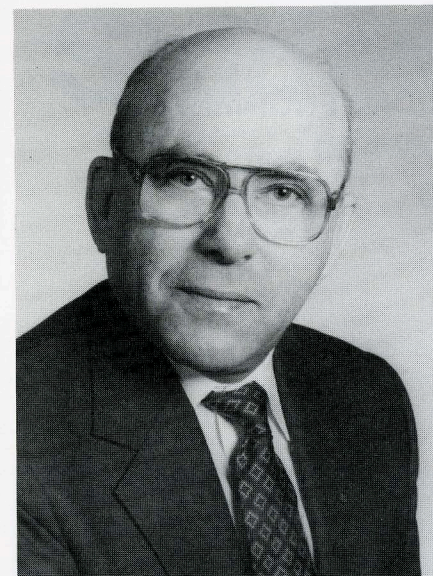
Left to right, Cathy Zeisler
Denice Rocca, David Miller
and Bryan Behun
visiting before dinner.



Dr. Alfred P. Szews
introduces Brendan Keese
for his pledge speech.



Dr. Robert L. Reid,
Dean, College of Engineering
makes closing remarks.



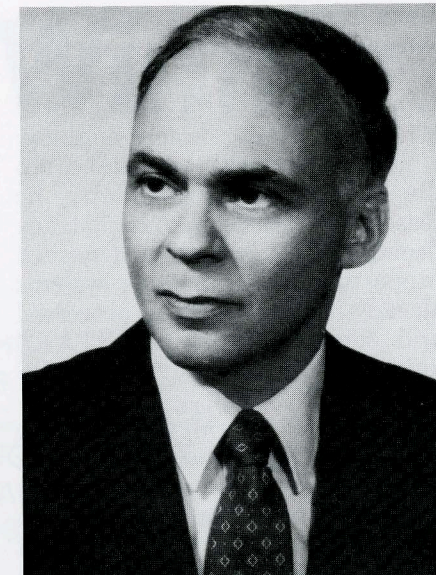
Dr. Irving Engelson

Dr. Irving Engelson has recently been made an honorary member of the A.S. Popov Society of Russia, in recognition of his contributions to the exchange of technical information between Russian engineers and scientists and their colleagues around the world. An honorary membership is the highest form of membership in the A.S. Popov Society, which is Russia's leading technical membership organization of electronics and communications engineers.

Dr. Engelson was honored by the A.S. Popov Society at a recent ceremony at the Russian Academy of Sciences in Moscow. He visited Russia in his capacity as Staff Director of Technical Activities of the Institute of Electrical and Electronics Engineers, Inc. (IEEE), the world's largest professional technical society with 320,000 members in 145 countries. During Dr. Engelson's visit, he delivered lectures in Moscow and St. Petersburg, as well as Vilnius, Lithuania and Riga, Latvia.

Dr. Engelson joined the IEEE staff in 1978 after more than two decades in higher education and with several major corporations. He holds a B.S. **magna cum laude** in electrical engineering from the Polytechnic Institute of Brooklyn, an M.S. in electrical engineering from Rutgers University, and a Ph.D. in EE from Worcester Polytechnic Institute, Worcester, Massachusetts.

HONORS AND AWARDS



Dr. Barry M. Horowitz

Dr. Engelson formerly held a number of academic positions including Professor and Associate Dean of the College of Engineering and Technology at the University of Nebraska, and Associate Professor of Electrical Engineering and Assistant Dean at the New Jersey Institute of Technology. He also held several positions in industry including eight years with RCA in a variety of capacities. He has served as a visiting Research Associate with the Bureau of Research in Neurology and Psychiatry at the New Jersey Neuro-Psychiatric Institute in Princeton, and has done consulting work for industry. He also served as a linguist while on active duty with the United States Army. His research in the area of communications and statistical analysis of bioelectric signals has demonstrated a number of important physiological and behavioral states of the brain.

He is a member of Eta Kappa Nu and has served on the HKN National Board of Directors in addition to being Chairman of HKN's Outstanding Young EE Award Organization Committee. Other professional and honor society memberships include Tau Beta Pi, Sigma Xi, and the New York Academy of Sciences. He has also served as a non-governmental representative to the Economic and Social Council of the United Nations.

Dr. Barry M. Horowitz, President and Chief Executive Officer of the MITRE Corporation, has received the Air Force's Exceptional Service Award at the company's headquarters in Bedford, MA. MITRE is a not-for-profit systems engineering firm, based in Bedford and in McLean, Virginia, engaged in scientific and technical projects for public benefit under contract to the Department of Defense and other government agencies.

The award was presented by Lt. General Gordon E. Fornell, Commander of the Air Force Electronic Systems Division. This is the highest civilian award that the Secretary of the Air Force can bestow. The Secretary approves about two of these each year.

According to the citation, Horowitz "distinguished himself through ingenious contributions to Command, Control, Communication, and Intelligence (C3I) systems deployed during Desert Storm. At his initiative, quick implementation of the Joint Surveillance Target Attack Radar System (JSTARS) to track and destroy mobile SCUD missile launchers added to the United States' successful destruction of these mobile weapon systems. His immediate recognition of our nation's need and his direction of the system integration required only six days and resulted in significant improvement of our forces' C3I abilities that saved

many lives by enabling our forces to eliminate various mobile targets."

Barry Horowitz was thoroughly familiar with JSTARS, since MITRE had been system engineer of its development program from the beginning. Consequently, he reasoned that the system could track fleeing SCUD launchers if needed supporting data from other systems already in the field were processed and communicated to JSTARS quickly enough. In turn, JSTARS would have to supply its information to fighter aircraft to destroy the SCUD launchers. These supporting intelligence and communication systems had to be integrated with JSTARS despite the fact that JSTARS was only operating as a development prototype at the time.

Since MITRE is the Air Force's System Engineer for their C31 systems, Horowitz had knowledge and access to information about all of the systems which would need to be connected in order to implement his concept.

A joint MITRE/Air Force/Raytheon team pulled the whole Horowitz concept together, and within ten days at least six mobile SCUD launchers had been destroyed by use of the enhanced JSTARS capability. A subsequent evaluation confirmed that about ten percent of all mobile launchers destroyed during hostilities resulted from the JSTARS effort.

Barry Horowitz received a bachelor's degree in 1965 from the City College of New York, a master's degree in 1967 from New York University, and a PhD, also from NYU, all in electrical engineering. He is a member of Tau Beta Pi and Eta Kappa Nu engineering honor societies, as well as a member of the board and former president of the Lexington-Concord (Massachusetts) Chapter of the Armed Forces Communications and Electronics Association (AFCEA).

In addition, he is a consultant to the Defense Science Board and the Air Force Scientific Advisory Board. He is also an Adjunct Research Fellow at the Center for Science and International Affairs, Harvard University, and a member of the Institute for Social and Economic Policy in the Middle East, John F. Kennedy School of Government at Harvard.

**THE
ALTON B. ZERBY
OUTSTANDING ELECTRICAL ENGINEERING
STUDENT AWARD
1992**

Anaheim, California
July 25, 1992

**Text by
Marcus Dodson**

**THE ETA KAPPA NU ASSOCIATION
1992**

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JURY OF AWARD

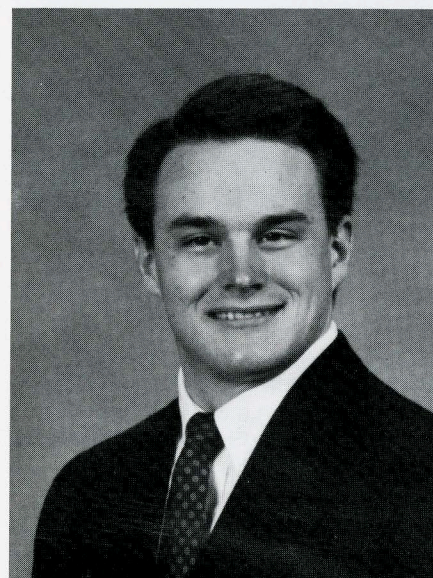
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Student Award Winner

**THE
ALTON B. ZERBY
OUTSTANDING ELECTRICAL
ENGINEERING STUDENT
AWARD
1992**



**PAUL DAVID ANDERSON
Winner**

PAUL DAVID ANDERSON graduated with a GPA of 3.96, ranking third in a class of 165 EE Seniors, was nominated by the Epsilon Rho Chapter at the Tennessee Technological University. He attended David Lipscomb University for two years before transferring to TTU. In 1991 Paul was named Honorable Mention for the Norman R. Carson Outstanding Electrical Engineering Junior. He is a member of IEEE and has been honored with membership in Tau Beta Pi, Phi Kappa Phi, Alpha Chi, as well as Eta Kappa Nu.

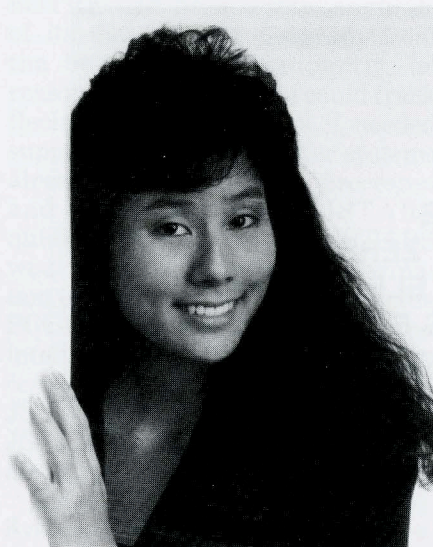
As part of the IEEE Device Design team he participated in the design and construction of a telemetry receiver for the Southeastern Region Conference (April 1992) and his Senior project was a computer telecommunications link. Paul was a physics lab. assistant while at David Lipscomb University. As an intern for Westinghouse, he worked at the Idaho National Engineering Lab. and Lawrence Livermore National Lab. While an intern for Martin Marietta Energy Systems at Oak Ridge National Lab., Paul participated in the development of computer systems that will be used by the US Navy to evaluate submarine acoustical noise.

While in various offices in HKN, he organized a tutoring program for the general EE student body. "This program has made a significant, positive impact on our Department's retention of students," said C.L. Carnal, HKN Faculty Advisor at TTU. At DLU, Paul was editor of "The Blabber" and a member of the debate team.

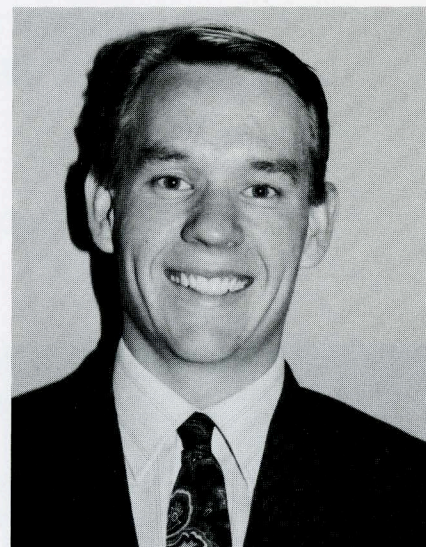
Paul is a Sunday School Teacher and active in other activities in his church. He is an Eagle Scout.

He played intramural football and volleyball. Paul is married.

Won expense-paid trip to Pan Pacific Hotel in Anaheim, California and an Award Dinner in his honor, from the Alton B. Zerby Perpetual Memorial Trust established by the Eta Kappa Nu Official Family, and a monetary gift from the Carl T. Koerner Perpetual Memorial Trust established by Edith Ann Koerner.

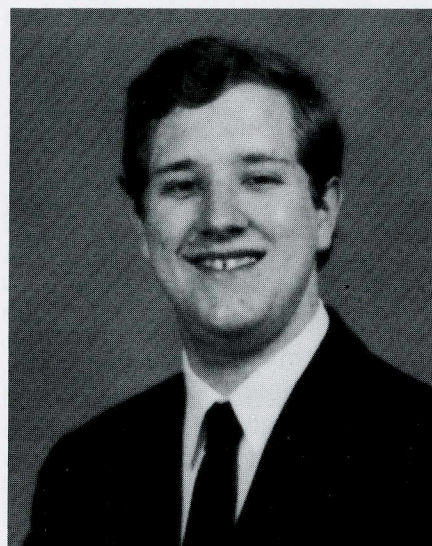


Deborah Fumi Arakaki
Honorable Mention

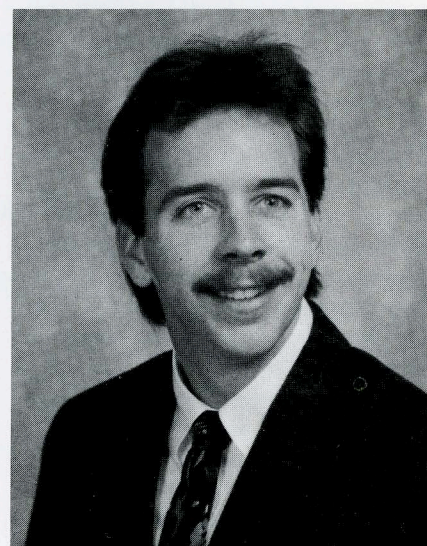


Jeffrey Dean Brooks
Honorable Mention

**THE
ALTON B. ZERBY
OUTSTANDING ELECTRICAL
ENGINEERING STUDENT
AWARD
1992**



Jonathan Weigel Dixon
Honorable Mention



Michael Scott McGovern
Honorable Mention

Deborah Fumi Arakaki graduated with a GPA of 3.89, ranking fifth in a class of 142, was nominated by the Delta Omega Chapter at the University of Hawaii-Manoa. She is a member of IEEE and has been honored with membership in Phi Eta Sigma, Golden Key and Eta Kappa Nu.

She was named Hawaii State Student of 1992 by the Hawaii NSPE and was beneficiary of the W.J. Holmes and E.E. Black scholarships. Ms. Arakaki, while an intern at the Hawaii Electric Co., designed distribution circuits and transmission structures, along with the supporting paperwork. She tutored EE students and participated in other activities.

Her music included the UH marching band and flute soloist with the Honolulu Symphony.

Jeffrey Dean Brooks graduated summa cum laude with a GPA of 4.0, ranking first in a class of 153, was nominated by the Beta Psi Chapter at the University of Nebraska-Lincoln. He is a member of IEEE and has been honored with membership in Golden Key, Tau Beta Pi as well as Eta Kappa Nu.

Jeffrey is enrolled in the US Navy's Nuclear Propulsion Officer Candidate program and served in the Persian Gulf crisis. He has done undergraduate research under the direction of Prof. Soukop and also is writing a MAPLE manual under his direction. Jeffrey has tutored and served on several committees to assist faculty and students in the administration and operation of the EE Department. He was voted Outstanding Senior by both IEEE and HKN members.

He enjoys participating in physical sports and reading.

Jonathan Weigel Dixon graduated with a GPA of 3.9, ranking second in a class of 164, was nominated by the Gamma Zeta Chapter at Michigan State University. He is a member of IEEE and has been honored with membership in Golden Key, Phi Kappa Phi, Tau Beta Pi and Eta Kappa Nu.

He has done undergraduate research under the direction of Prof. Chen in electromagnetics and has submitted two papers on computer programs to the IEEE Engineering in Medicine and Biology Society. Mr. Dixon is a member of the Board of Ministry of the Lutheran Church and active in many of its committees and projects, including scouting. He organized seminars for undergraduate students.

He enjoys his trumpet and church activities.

Michael Scott McGovern graduated with BS/MS degrees (five year program) with a GPA of 3.93, ranking third in a class of 195, was nominated by the Beta Alpha Chapter at Drexel University. He is a member of IEEE and has been honored with membership in Tau Beta Pi, Phi Eta Sigma and Eta Kappa Nu.

Michael held the position of Teaching Assistant and for 15 months was an intern with the Navy's Air Warfare Center when he wrote several programs. The title of his Masters thesis was "Novel Active Wavelength Division Multiplexing Light Source for Fiber Optic Communications". He received the American Society of Naval Engineering Scholarship. Michael organized forums for students dealing with EIT, graduate school and the BS/MS program.

He participates in fencing, basketball, softball and volleyball.

FINALISTS 1992

Curtis Charles Clifton Iowa State University
Donald James Courville, II .. University of Southwestern Louisiana
Eric Jon Ojard Pennsylvania State University
Shayne Xavier Short Texas A & M University
Diana Cynthia Ulrich Ohio State University

**THE ALTON B. ZERBY
OUTSTANDING EE STUDENT**

"The Alton B. Zerby Outstanding Electrical Engineering Student may be described as being 'outstanding by virtue of his scholastic excellence and high moral character; coupled with demonstrated exemplary service to classmates, university, community, and country'."

Among the purposes which Eta Kappa Nu expects to achieve by the operation of this program are to: annually honor the outstanding electrical engineering student by providing accepted recognition of accomplishments in this field; provide recognition to the outstanding electrical engineering student's school; provide motivation to electrical engineering students to earn membership in Eta Kappa Nu; provide recognition to the undergraduate chapter of Eta Kappa Nu from which the outstanding EE student was chosen; provide additional opportunity for publicity and recognition of the Eta Kappa Nu Association and its objectives; and provide an incentive for electrical engineering schools not having a chapter of Eta Kappa Nu to qualify and establish a chapter.

Inaugurated in 1965, an Outstanding Electrical Engineering Student Award Program of Eta Kappa Nu, it has become a traditional means of providing recognition to deserving Electrical Engineering students in the United States. In 1975 the name was changed to "The Alton B. Zerby Outstanding Electrical Engineering Student Award" to honor and perpetuate the memory of Mr. Zerby, a leader in Eta Kappa Nu and dedicated to the students. The award takes into consideration not only the scholastic achievements of the student but also pays due attention to other attributes; participation in service to classmates and university in the form of curricular and extra-curricular activities, demonstrated interest in community and fellow human beings, and regard for country. These all play a vital part in the considerations leading to being chosen. It measures the student against the traditional yardstick established by Eta Kappa Nu in its goal to achievement of the well-rounded person, one who is neither scholarly drudge nor gregarious sport, but what might be considered an appropriate combination of the best qualities of both.

Four years were spent in the development of this program by the Los Angeles Alumni Chapter of Eta Kappa Nu. Much thought and effort went into the structuring and development of the many features which are needed and the procedures which must be followed in order to be assured that a truly representative selection of the top Electrical Engineering students have been examined prior to the designation of one of these individuals as the Outstanding Student.

From Left,
President Laureen Parker
Winner, Paul Anderson
and Mrs. Paul Anderson



At far left, Billie Ball
Marcus Dodson,
Paul Anderson,
James D'Arcy
and Stuart McCullough

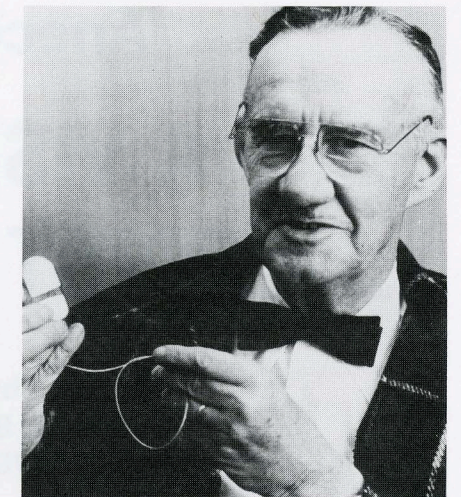
From left, Marcus Dodson
Laureen Parker
Paul Anderson
and Robert Betten



HEARTFELT DEVICES

by
Kathy Bodovitz and Ed Hardy

Editor's Note: In April 1992, Dr. Wilson Greatbatch received Eta Kappa Nu's first Vladimir Karapetoff Eminent Members' Award (See BRIDGE, Vol. 88 No. 4, August, 1992). The following article first appeared in the June, 1992 issue of the Cornell Alumni News. It is reprinted here with permission.



Dr. Wilson Greatbatch

In 1958, Wilson Greatbatch made what turned out to be a momentous decision. "I had \$2,000 in cash and enough besides to feed my family for two years. I put it to the Lord in prayer and felt led to quit all my jobs and devote my full time to the pacemaker," he recalls in his 1983 book, *Twenty-five Years of Pacemaking*. "I gave the family money to my wife. I then took the \$2,000 and went up into my wood-heated barn workshop. In two years I built fifty pacemakers, forty of which went into animals and ten into patients. We had no grant funding and asked for none. The program was successful. We got fifty pacemakers for \$2,000. Today, you can't buy one for that."

Alone in his workshop, Greatbatch made the first implantable pacemaker—a huge improvement over the original, external pacemakers that used large, cumbersome batteries for their power. The implantable model runs on a battery and transmits an electrical signal to the heart to make it beat regularly. Pacemakers today are lifesavers for people with congenital heart defects, heart disease or infection or deterioration that comes with age.

That he became an inventor was not a great surprise to Greatbatch. "I've always been interested in technical things," says the man who built his first two-tube shortwave radio receiver in his teens, in West Seneca, New York. He attended Cornell on the G.I. Bill, graduating with a degree in electrical engineering in

1950. He then received a master's degree in electrical engineering from the University of Buffalo.

While Greatbatch worked at Taber Instrument of North Tonawanda, New York, where he designed plug-in transistor modules and aerospace medical amplifiers (including the biomedical amplifiers used on Sam and Miss Sam, the monkeys sent up on NASA's Little Joe Mercury spacecraft) he moonlighted with a Buffalo doctor who was researching the sound of heartbeats. Greatbatch used a movie camera to record the sounds off an oscilloscope. When he installed the wrong part into one of the oscilloscopes, he serendipitously discovered what was needed to drive a heart. "For the next five years, most of the world's pacemakers were to use a blocking oscillator just because I grabbed the wrong resistor," he says.

Greatbatch says the technical key to his success was the invention of the transistor in 1956. "I knew I could build an implantable pacemaker but not with tubes and batteries," he says. With the new transistors in hand, he headed to his workshop. "I'd work a while, make a device, take it down to the hospital and try it out. The first two years, I did only animal pacemakers." When those proved successful, he moved on to pacemakers for humans.

The hardest part was selling the invention to skeptical doctors. "There were years of traveling across the country, going into research seminars at eight in the morning and

convincing a group of recalcitrant doctors that this would work. After a while it became obvious they had to use them," he says. Greatbatch formed Wilson Greatbatch Inc. and licensed the Chardack-Greatbatch Implantable Cardiac Pacemaker to Medtronic, Inc. of Minneapolis.

More than \$1 billion worth of pacemakers were sold last year and doctors are now quick to praise Greatbatch's invention. Dr. Kenneth A. Ellenbogen, a cardiologist at the McGuire Veterans Administration Hospital in Richmond, Virginia, and a member of the American Heart Association's Committee on Electrocardiography and Cardiac Electrophysiology, says the implantable pacemaker has saved thousands of lives. "It's hard to count how many people would not be here today if not for the pacemaker," he says.

Greatbatch has received many honors for his work. The Association for Advancement of Medical Instrumentation gave him its highest award, the National Society of Professional Engineers honored the pacemaker as one of engineering's ten outstanding contributions to society in the last fifty years, and the National Inventors Hall of Fame inducted him in 1986.

"I'll be 75 in another three years," Greatbatch says, "and I plan on retiring then and getting a PhD. I'd like to do some more work in molecular biology. I think that's where the future of all sciences lies. I get tired of the kids who say there's nothing new to do."

Anecdote: A VISIT TO POINT HOPE

by
George W. Swenson, Jr.
© GWS, 1992



Editor's Note: Dr. George W. Swenson, Jr. is Professor Emeritus of Electrical Engineering and Astronomy at The University of Illinois-Urbana.

During my time at the University of Alaska I'd become friendly with Jim, a bright young anthropologist. In the mid-1950's he'd begun a year-long residence in Point Hope, to perform a detailed study of contemporary Eskimo village life. Point Hope is at the extreme northwestern corner of Alaska on a narrow spit extending westward into the Chukchi Sea. The migration routes for seals, walrus and whales passed close to this point, so groups of Eskimo sea-mammal hunters had occupied the place apparently for thousands of years. Jim invited me to spend a week with him at Point Hope, so one day in the summer of 1956 I hopped the DC-3 for Nome and thence to Kotzebue.

Getting to Point Hope wasn't particularly easy. From Kotzebue I was to take the mail plane, an ancient 4-seat, Cessna 195. Unfortunately, just after the airline DC-3 departed, a dense fog settled in and the Cessna couldn't take off. There was no hotel room available, so I bedded down in the loft of the Kotzebue general store where there were a couple of cots for just such occasions. The fog persisted. Two days later the Eskimo mail pilot came up the attic stairs and called "let's go." I could hardly believe my ears. The fog was still hanging like a heavy gray blanket about fifty feet above the surface of Kotzebue Sound. As a newly-licensed private pilot I knew one couldn't fly in that stuff,

and I so informed the bush pilot as I tagged after him along the road to the airstrip. He responded, "If I let a low ceiling stop me, I'd never get to fly this route."

So, off we went, skimming the waves of the Sound in a northerly direction. First stop, Noatak, a tiny cluster of log cabins on the bank of the Noatak River, a few miles upstream of the Sound. We landed on a gravel bar in mid-stream, with no discernible markings other than some faint wheel tracks. A villager rowed over in a little boat, bringing an apparently-empty mail sack. After exchanging a few words in Eskimo with Tommy, my pilot, he rowed off again with an equally empty-looking sack and a large carton labeled "Sears, Roebuck—Ladies' Luggage Set—Powder Blue." Tommy patrolled the "runway," heaving aside a small driftwood log and rolling away an offending boulder.

After this takeoff we headed directly up a narrow canyon in the hills to the northwest, still under a solid, low overcast. I was quite apprehensive about this, because it violated everything I'd been taught about flying in hilly terrain. I thought I could see where the canyon floor rose to meet the clouds, and we certainly didn't have room to turn around. Tommy apparently noticed my white knuckles, as he remarked that the ceiling usually rises as the canyon rises. Sure enough, we soon passed over the crest of the hills with the rocks ten feet below our wheels and the clouds ten feet above our heads. Plenty of room! Ahead, the ceiling descended and so did we, reaching an altitude



Salmon drying on the shore
of Kotzebue Sound.

The Cessna 195 serving
Chukchi Sea villages north
of Kotzebue in 1956. The
airport infrastructure consists
of the two oil drums at
left and right of the photo,
indicating a suitable place
to land.



of about 30 feet as we came to the shore of the Chukchi Sea.

We flew along, just skimming the beach, as flocks of sea birds whipped by on either side. These were thick-billed murre, hundreds of them. I asked Tommy if he'd ever hit one. "Once in a while." Nothing more. Soon we came to Kivalina, a group of canvas tents on the tundra just above the gravelly beach. Again I could see no sign of an established airstrip, and Tommy merely remarked, "If you have to land on tundra, touch down on the green stuff rather than on the brown gravel. The grass is much firmer than the bare ground."

(This conversation reminded me of one with another bush pilot who advised, "If you have an engine failure over the woods, try to land in birch trees rather than in spruce. Spruce trees are brit-

tle and will break off and puncture the plane. Birch are limber and will let you down easy." I asked him how he knew, and he said he'd tried it both ways.)

As we throttled back on our final approach, I thought I could see an open, level space ahead. Sure enough. It even had an oil drum at either end to mark the runway. As we touched down, people came running from all directions. Tommy killed the engine as we stopped just short of the crowd, and I asked if he'd ever hit anybody. No, he said, but he'd once decapitated a dog with his propeller. Airport security seemed a bit lax at Kivalina.

Again an exchange of limp mail sacks, another takeoff and another low-altitude flight northward along the shore. More sea birds vying for airspace,

The Chukchi Sea on a calm summer midnight.



but fortunately no collisions. Then Point Hope, at last. The first impression from the air was a couple score of huts strung along the border between the tundra and the beach, about 150 meters from the water. Jury-rigged broadcast-band antennas stuck up everywhere. Several sealskin boats (umiaks) and a few kayaks lay along the beach. All this as Tommy landed us on a grassy open space on the tundra, again skillfully avoiding the dogs and Eskimos, young and old, as they rushed to participate in the once-a-week event. And this was a rare event, indeed, for there was a passenger arriving, a stranger none of them had ever seen. I suppose a stranger, to an inhabitant of a small, isolated community must be as much a curiosity as a new species of animal or bird is to you or me.

The people crowded around me as Tommy heaved my duffel bag out of the plane. One young man asked my name and then introduced himself and asked "How do you like Point Hope? Pretty nice place, eh?" I murmured something polite as I thought to myself "My God, what a dismal dump!" Native villages in the Arctic are pretty much alike, or at least they were in the 1950's and 1960's. In the November, 1982 issue of *Bridge of HKN* (Vol. 79, No. 1), I described the village of Baker Lake in the Northwest Territories of Canada as it was in 1964:

"Arctic villages are not really attractive places, especially in the summer. Vegetation is sparse and slow-growing, and decay and corrosion proceed very slowly; so the trash of civilization tends to lie around indefinitely exposed to full view. The only commodity in plentiful supply in the Arctic is the ubiquitous empty oil drum. Other materials are scarce and expensive because of the cost of

transportation, so houses tend to be tiny and patchworky, without style or decoration. Village streets are metaled with gravel, at best, and there's a clutter of snowmobiles and decrepit jeeps and tractors lying about."

That description could equally have applied to Point Hope in 1956, except that the abrupt replacement of dog teams by snowmobiles had not yet occurred. Arctic peoples must struggle for the necessities; there's no economic surplus that can be devoted to beautification of their surroundings and no tradition of pride in the appearance of the community.

My host Jim elbowed his way through the crowd. Tommy informed me he'd be back in a week: be ready. Jim led the way to his house, which turned out to be a one-room wood and tarpaper shack about ten by twenty feet. Inside, part of the room had been curtained off to conserve fuel. Jim slept on a folding cot; I was to spread my sleeping bag on the floor, which, I noted, had a liberal coating of oxidized seal oil inherited from previous tenants. Chained outside were six rather elderly sled dogs. Jim was an experienced dog driver, having maintained a recreational dog team near the Fairbanks campus. As his goal was to understand the village way of life, his intention was to live as much like an Eskimo hunter as possible. Dogs were essential in those days just before the motorized sled (snowmobile) replaced them. He'd joined a whaling crew, the basic social and economic unit of the village, and had spent the previous winter hunting seals on the sea ice. He said ruefully that the typical hunter had killed fifty seals during the winter, while he only got two. Fortunately, his government research grant protected him from famine.

Jim had suggested that I bring some beer with me, as the village was officially "dry", but he said



General view of the village of Pt. Hope in 1956. Wooden shacks, sod igloos, dog sleds, skin-boat frames, and oil drums are all typical.

A sod igloo at Pt. Hope in 1956. The boat frame on the roof awaits its sealskin cover.



Jim's house at Pt. Hope, 1956. The meat-drying rack is built of whale and jawbones and driftwood, traditional raw materials of the Arctic.

An Eskimo charmer at Pt. Hope. Her swing is supported by the jawbones of a bowhead whale.



Children playing in the school yard at Pt. Hope.



Eskimo girls playing on a freshly re-covered large skin boat, called an "Umiak." The covering is sewed from the skins of several bearded seals, or uzruk.



A diaper wash supported by two driftwood poles on the shore of the Chukchi Sea.

Drying seal meat and muktuk (whale skin, white color) on a house at Kotzebue, Alaska, 1956.



nothing about groceries. Now this oversight turned out to be important. His larder was nearly bare; likewise, the shelves of the village cooperative store. Literally, the only things for sale were one sack of coal, a few gallons of gasoline, and a one-pound box of dried prunes. We bought the latter.

But how were we to eat during my visit? A grocery order by airplane from Kotzebue requires a week's lead time. The cooperative village stores along the coast of Alaska were replenished once a year by the ship North Star from Seattle, but my visit was before the vessel's arrival. Jim recalled that he had a walrus in his cache. Every family had a cache, a pit dug down to the permafrost on the tundra above the village, where meat was stored. We hitched up the dogs, walked up to the cache, and with the dogs' help hauled the huge

carcass out of the hole and down to the shack. Alas, the whole thing was covered with green mold, so unappetizing that we both considered it completely beyond the pale. With a dull axe and much effort we cut it up for dog food. Jim's cache contained nothing else.

I'd noticed a few arctic ground squirrels on the tundra. They ought to be edible, shouldn't they? Jim had a center fire .22 rifle. We crouched behind a hummock, waited until a squirrel poked its head out of its hole, and squeezed off a shot. Just at that instant, the squirrel ducked and the bullet raised a puff of dust right where its head had been. This happened several times. Jim mentioned that the young Eskimo boys regularly killed squirrels with their slingshots. Eventually we gave up. Still no groceries.

Murre's eggs. The pocket watch is for scale. The conical shape helps protect the eggs from rolling off the cliff ledges where the birds nest.



We saw some young men loading a skin boat on the opposite side of the spit from the village, so we strolled over there. Coming closer we noticed that their outboard motor was missing one of its three propeller blades. They told us they were going across the bay to the mainland to hunt caribou. They'd be gone a couple of days. We noted that their entire outfit consisted of a large chunk of raw meat in an old five-gallon gas can, a couple of rifles, and some home-made paddles. They had only enough gas for a one-way trip, so they planned to paddle over and motor back. We offered to buy them the additional gas for the round trip if they'd bring us a quarter of caribou, and they agreed. I don't believe we ever collected, however.

Now Jim recalled that he'd been on an egg-gathering trip with his whaling crew. He'd never collected his share of the proceeds; maybe he had some eggs coming. The Eskimos gathered eggs by lowering themselves on ropes down high seaside cliffs which were the nesting sites for tens of thousands of thick-billed murre. This bird, about the size of an American crow, is one of the most abundant seabirds. It dives for its food, fish, squid, and crustaceans, and makes daily round-trip feeding flights as long as 100 miles. We walked to the house of the whaling crew captain, where we were invited in for coffee and I was introduced to the family. We conversed about the superior attributes of Point Hope as a place to live and to visit; the people were proud of their village and their region and anxious that the visitor should appreciate them.

After the formalities Jim broached the subject of the eggs, whereupon the captain went to his storeroom and emerged with a bushel basket about two-thirds full. A murre's egg is half again as large as a domestic hen's, and is bright blue-green with large, black polka-dots! The captain

said they were very good to eat. I was willing. We lugged them home and got out a skillet.

With the first egg we opened we learned the hard way a lesson that any housewife could probably have taught us: crack it first into a dish for olfactory inspection. We quickly found that about one egg in three was fresh enough to eat. (The dogs welcomed the rest.) Then another surprise—when fried, the "white" albumen doesn't turn opaque, but solidifies into a rubbery, perfectly transparent mass through which the bottom of the pan is plainly seen. In the center the yolk shown a brilliant orange. One egg was large enough for a minimal meal, but their unusual appearance put us off. Finally we found that they assumed an acceptable taste, hue and consistency when scrambled. Famine had been averted.

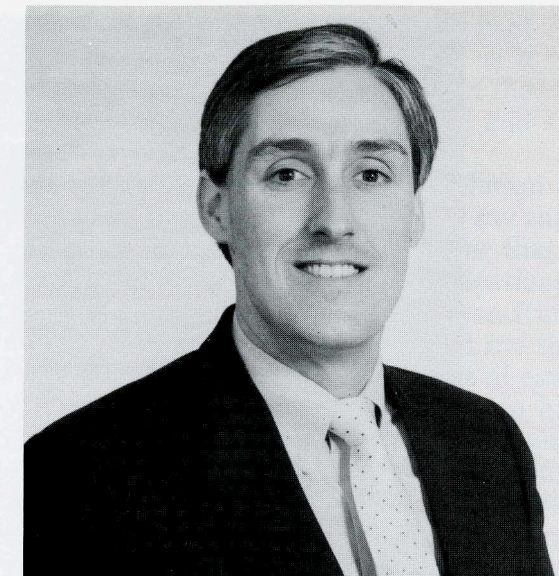
The rest of the week passed quickly in the exploration of the fascinating village and its people, under Jim's expert tutelage. They are remarkable people, with a way of life evolved through thousands of years of surviving the harshest of environments, but now under pressure to evolve much more rapidly as the world's population explosion clouds the future of hunting/gathering as a way of life.

The mail plane arrived on schedule and we flew south toward Kotzebue. More thrilling landings on primitive airstrips at tiny villages, routine for the bush pilot who does it for a living. My adventure ended, but I remember those people to whom danger, hardship, even hunger are daily fare.

For further (and more authoritative) reading: "Point Hope—an Eskimo village in Transition," by James W. VanStone, University of Washington Press, Seattle, 1962. Dr. VanStone, now of the Field Museum in Chicago, recently told the author, "last summer I visited Point Hope for the first time in 31 years. The changes are mind-boggling."

Dr. Barry W. Johnson Wins C. Holmes MacDonald Outstanding Teacher Award

by
Eric D. Cutright



Dr. Barry W. Johnson

As the President of the Gamma Pi Chapter of HKN at the University of Virginia (UVA), it gives me great pleasure to announce that the winner of the 1992 C. Holmes MacDonald Outstanding Teaching Award for Young EE Professors is UVA's very own, Dr. Barry W. Johnson. The award presentation was made by Mr. Robert Arehart, the immediate past president of HKN, at the University of Virginia on April 24, 1992. The presentation ceremony was hosted by Dr. Robert Mattauch, chairman of the department of electrical engineering at UVA, and was attended by approximately 50 members of the 1992 undergraduate electrical engineering class. Dr. Johnson is an Associate Professor of Electrical Engineering at the University of Virginia. He received the B.S.E.E. (with high distinction), M.E.E.E., and Ph.D. (electrical engineering) degrees from the University of Virginia in 1979, 1980, and 1983, respectively.

Dr. Johnson was with the Government Aerospace Systems Division of Harris Corporation from 1982 to 1984 and served as an Adjunct Professor at the Florida Institute of Technology in 1983-1984. He joined the University of Virginia as an Assistant Professor of Electrical Engineering in 1984 and was promoted to Associate Professor in 1989. His research and teaching interests are in the areas of fault-tolerant computing, VLSI testing, and microcomputer-based systems. He is the author of a textbook entitled *Design and Analysis of Fault-Tolerant Digital Systems* which was published by Addison-Wesley Publishing Company in 1989. In addition, Dr. Johnson is the author or co-author of 4 book chapters, 19 journal articles, and 42 conference papers.

In 1984 Dr. Johnson co-founded the Center for Semicustom Integrated Systems (CSIS), an interdisciplinary research center focused on fault tolerance, testing, and VLSI technologies. The CSIS currently involves 10 faculty members, 3 full-time research staff members, and approximately 40 graduate students. The Center receives research funding from the National Science Foundation (NSF), the Defense Advanced Research Projects Agency (DARPA), the Virginia Center for Innovative Technology (CIT), the National Aeronautics and Space Administration (NASA), and six industrial sponsors. Total research funding is approximately \$1.5 million per year. Dr. Johnson's personal research focuses on the design, modeling, and analysis of fault-tolerant architectures which are intended for critical applications. He currently has seven doctoral students and seven masters students working with him on various aspects of his funded research program.

Dr. Johnson has taught courses on fault-tolerant computing, microcomputers, digital systems design, advanced switching theory, and microcomputer interfacing. For the past two years he has chaired the department's Undergraduate Committee which has undertaken a detailed study and revision of the electrical engineering curriculum at the University of Virginia.

Dr. Johnson is the faculty advisor for the student chapter of Eta Kappa Nu at the University of Virginia and is a member of Eta Kappa Nu, Tau Beta Pi, and Sigma Xi. He is a Senior Member of IEEE and a member of the IEEE Computer Society. He was recently elected as the First Vice President of the Computer Society and is a voting member of the Computer Society's



Dr. Barry W. Johnson (standing, left) is presented the 1992 C. Holmes MacDonald Award by Mr. Robert Arehart, as the chairman of the UVa EE Department, Dr. Robert Mattauch (far left), looks on.



Ruhul Quddus (far left), Vice-President of the Gamma Pi Chapter, and Eric D. Cutright (center left), President of the Gamma Pi Chapter, talk with Mr. and Mrs. Arehart after the awards presentation.

Executive Committee and Board of Governors. He is also a member of the Editorial Board of the IEEE Transactions on Computers. Additional volunteer activity in the IEEE includes being a member of the Bookbroker Committee of the Technical Activities Board (TAB).

Dr. Johnson has received several awards including the 1991 Frederick Emmons Terman Award from the American Society for Engineering Education, a 1990 Outstanding Faculty Award from the State Council of Higher Education in Virginia, the 1989 University of Virginia Alumni Association's Outstanding Young Faculty Award, the 1988 Department of Electrical Engineering's Young Faculty Teaching Award, and the 1987 Eta Kappa Nu Virginia Chapter Award for Outstanding Contributions to the Department of Electrical Engineering. Dr. Johnson's paper entitled "A Course on the Design of Reliable Digital Systems" received the Outstanding Paper Award from the IEEE Transactions on Education in 1987. He has also received a Certificate of Appreciation, an Outstanding Contribution Award, and a Meritorious Service Award from the IEEE Computer Society.

The Johnson family includes his wife Susan and one daughter, Ashby, who is 13 years old. Susan teaches third grade in the Charlottesville area, and Ashby is an eighth-grade student. The family spends much of its spare time participating in sporting events of various types.

Dr. Johnson is very highly respected by both his students and peers at the University of Virginia. The Chairman of UVa's EE Department, Dr. Robert J. Mattauch, had this to say about Dr. Johnson:

"Barry Johnson is exactly the kind of faculty member every department head would like to have a dozen of. He has certainly been recognized as one of the very best teachers in his Department, the School of Engineering and Applied Science, and the Commonwealth of Virginia as indicated by his many teaching awards including the highly prestigious State Council of Higher Education Outstanding Faculty Award for 1990. The C. Holmes MacDonald Award from Eta Kappa Nu this year further underscores Barry's eminence in teaching on the national level. In addition, Dr. Johnson was a recent recipient of the ASEE Frederick Emmons Terman Award for his definitive book entitled *Design and Analysis of Fault-Tolerant Digital Systems*. Not only is Dr. Johnson known by his students and colleagues to be a very highly gifted teacher, but he is also internation-

ally known for his research of fault-tolerant computing systems. In addition, he is a recognized leader in the IEEE and in the academic affairs of his Department and School."

From a student's perspective, Dr. Johnson is simply the ideal professor. I can honestly say that he is simply the most outstanding teacher that I have ever encountered in my 18-year educational career. In the two classes that I have taken from Dr. Johnson, the aspect that has amazed me the most about him is the incredible amount of care and individual attention that he devotes to his students. He maintains an open-door policy with his students: any time they come to his office for assistance, he usually stops whatever he is working on and gives them his full attention for as long as they require. As one of his Ph.D. research students, I can vouch that this is a fantastic quality for your research advisor to possess! This quality is very admirable considering that Dr. Johnson is such an active researcher. His research in fault-tolerant systems has been supported by numerous industrial giants, including NASA, the Army, IBM, Hughes, SRC, and Union Switch and Signal. Dr. Johnson uses his textbook, *Design and Analysis of Fault-Tolerant Digital Systems*, for his graduate class in reliable digital system design. I had the pleasure of taking this class from him, and can honestly say that it was the most educational, useful, and best-taught class that I have ever taken in my educational career. Dr. Johnson has a superior sense of organization and presentation, making his classes a pleasure to take.

Dr. Johnson is also actively involved in our chapter of HKN. He has served as our faculty advisor for several years, and has done a truly outstanding job. He regularly attends all of our chapter activities, and has been an invaluable resource in the planning and preparation of chapter events. At least twice a year, he invites all the members and new candidates to his house for a huge party. His great interest in his students and his devotion to teaching and research recently earned him the HKN Gamma Pi Chapter EE Award, which is given by the members of our chapter in recognition of excellence in electrical engineering education and research. He is extremely devoted to his profession, and obviously enjoys passing his enthusiasm for electrical engineering on to his students. Speaking for all the EE students and professors at the University of Virginia, I can say that we are all extremely proud of Dr. Barry Johnson, and feel that he was certainly an excellent choice for the 1992 C. Holmes MacDonald Outstanding Teaching Award for Young EE Professors.

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