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HISTORY of the COLLEGE OF ENGINEERING

WICHITA STATE UNIVERSITY



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Reminiscences of
MELVIN H. SNYDER
Professor Emeritus of Aeronautical Engineering

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A HISTORY OF THE COLLEGE OF ENGINEERING AT WICHITA STATE UNIVERSITY

Personal Reminiscences of Professor Melvin H. Snyder

Preface

This "history" is not a complete history as it would be reported by a historian. It is, rather, my story of how the Wichita State University College of Engineering came to be as it is today. It is my story because I lived through most of it. Of course, I didn't experience the very first days, but I have talked with many who did. I knew many of the engineering pioneers -- Alex Petroff, Roy Elliot, Jerry Gerteis, Dwane Wallace, Tom Salter, Brownie Miller, and their university associates, Lloyd McKinley, Hugo Wall, Worth Fletcher, John Rydjord, George Wilner, and, of course, Ken Razak.

I came to Wichita, not to stay, but to learn and to move on. But something happened -- I got involved with building a school of engineering, and I stayed on. As I look back, I can't imagine a more interesting life than the one I have had here.

Probably the reader -- if anyone plows through these memoirs -- will find that I spend too much time on the first three decades of the engineering school and not enough on the later four. I have two excuses. I am in my seventy-fifth year, and I find that I remember more clearly the events of many years ago than the events of last week, or last year. Secondly, what we were doing in the early days was challenging, and seemed to be more fun. Some may object that I write mainly about the Aeronautical Engineering department to the neglect of the others. I write what I know and have experienced. The writing was facilitated by the cheerful assistance of Betty Alford, the typing of Kay Snyder, and the reading by Dick Holloway.

-- Wichita, Kansas, January, 1996

My Story

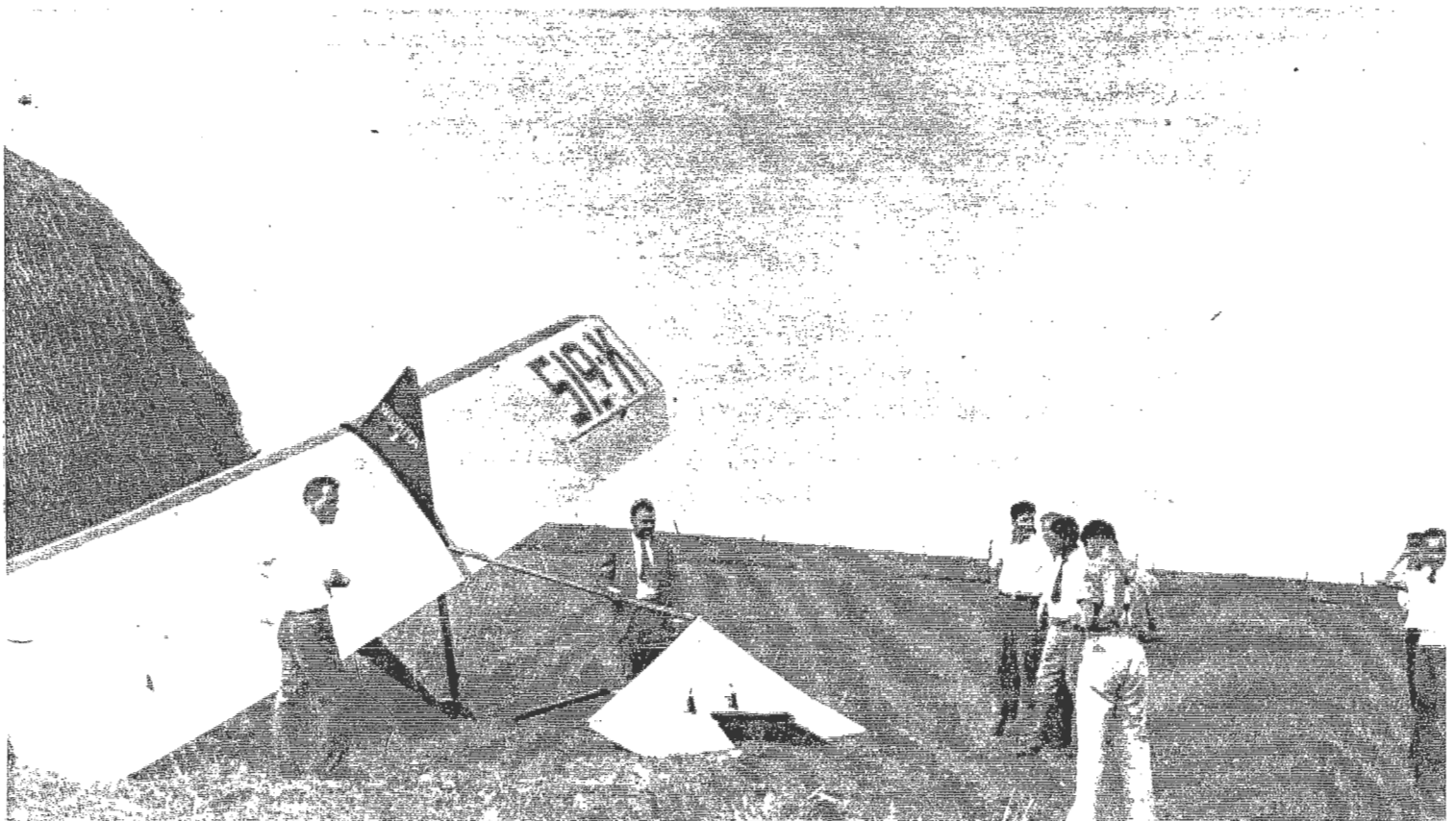
For me, the history of the W.S.U. College of Engineering began the week after Christmas, 1946. Except, it wasn't the College of Engineering, nor was it the Wichita State University. It was the Municipal University of Wichita (usually called "W.U."), and it was the Department of Aeronautical Engineering, and, of course, 1946 was not the beginning of engineering education at Wichita University.

To tell the story of the beginnings and the development of the College of Engineering, it is logical to divide that development into four periods -- the Petroff Era, the Razak Era, the Jakowatz Era, and the Wilhelm Era -- periods named for the four leaders of the school.



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THE PETROFF ERA



The Petroff Era

In 1926, the Congregational Church turned the facilities of Fairmount College over to the city of Wichita, after a vote of the citizens to support it as a municipal university. It required two separate elections (and a lot of campaigning by faculty, led by Marie Graham, a history instructor and president of the alumni organization) to get the necessary votes to ratify the agreement.

The task of converting the liberal arts college into a university involved setting up a public governing board -- The Board of Regents -- and establishment of four colleges within the University -- the College of Liberal Arts and Sciences, the College of Education, the College of Fine Arts, and the College of Business Administration and Industry.

The words "and Industry" were included in the name of the B.A. College so that it could serve as home for freshman and sophomore engineering courses. The basic courses in engineering drawing and statics could be taken along with chemistry, physics, mathematics, speech, English, and non-technical elective courses by students wishing to major in Civil, Mechanical, Electrical, and Chemical engineering. These students could transfer their credits to the University of Kansas or to Kansas State A. & M. College for the completion of their degree requirements.

From the time of World War I through the twenties, there was wild, erratic growth of aviation throughout the nation, nowhere more than in Wichita, where the large number of aircraft companies changed the "Peerless Princess of the Plains" to the "Air Capital of the World". This burgeoning industry had to progress from barnstormers and pasture mechanics to trained engineers, professional pilots, and industry managers.

Responding to this community need, the W. U. Board of Regents approved, in early 1928, a four-year course in Aeronautics. A Bachelor of Science degree in Aeronautical Engineering was to be awarded to the graduates of the four-year course. The 1928 issue of the Parnassus, the university yearbook, lists Roy W. Elliott, the Bursar (and a civil engineer), as Assistant Professor of Engineering. It also pictures the Engineers Club with 24 members and officers -- Jerry Gerteis, president; Emerson Brooks, v.p.; Leslie Bosworth, sec-treas.; Garvin Taylor, sgt. at arms; and Sidney Brick, reporter.

According to Dr. E. J. Rodgers, later chairman of the Aeronautical Engineering department at Wichita State, there were five aeronautical engineering degree programs established prior to this time. These five were at the University of Seattle, Leland Stanford University, the University of Michigan, New York University, and the Massachusetts Institute of Technology.

Dr. Rodgers described the early days at W. U. ---

"It was then announced in June of 1928 that the College of Aeronautics would be opened by the University of Wichita in the Fall of 1928. Amos O. Payne, technical and consulting engineer of the Swallow Airplane Manufacturing Company was named as the Chief Engineer and Director of the new school. He would not only have a faculty of theoretical experts on the university campus, but would have the cooperation of the practical engineering staff of the eight Wichita aircraft factories, the Marshall Field Service Unit of Fort Riley and the Aeronautics Branch of the United States Department of Commerce. Mr. Payne evidently did not accept the position. The Topeka Kansas Journal of September 27, 1928, reported that Captain Walter Fitz of the United States (Navy) Bureau of Aeronautics in Washington had agreed to become head of the University of Wichita School of Aeronautics as announced by Dr. Foght, president of the University. The intention was that Secretary of the Navy, Curtis D. Wilbur, would accept Captain Fitz's resignation in order for him to take this position. It was stated that the appointment was being made to a position vacated by Amos O. Payne late in the summer in order for Payne to take a position in St. Louis.

"Captain Fitz however did not show up at the university. Perhaps his resignation was not accepted. The Board of Regents of the Wichita University then accepted the recommendation of President Foght that Alexander A. Petroff, a graduate of the University of Michigan, be named director of the School of Aeronautics of the university and Professor of Aeronautics at a salary of \$3,000.00 for the 9-month period. The Board accepted this recommendation with the provision that Dr. Foght be satisfied after a personal interview with Mr. Petroff. This action took place at the October 4, 1928 meeting of the Board of Regents. He evidently met the favor of Dr. Foght and was soon appointed Director of the School of Aeronautics.

"The life story of Mr. Petroff is interesting as a study in itself. He certainly can be ranked as one of the pioneers of the aeronautical engineering

educational field. Alexander Petroff was born in Russia claiming Perm as his home town. He graduated from the Perm Gymnasium and entered the Military Academy at Moscow. On graduation he was made a lieutenant in the Russian Army during the first World War and fought near the Austrian lines. Later he attended the University of Perm, and, on graduation, became a member of the Russian Nationalist Army under General Kolchak. He also worked while in Russia as an engineer on the China Eastern Railroad in 1920 and assisted in the installation of an automatic telephone system in Siberia.

"He came to the United States in 1922 as a Russian refugee and attended the University of California for a short time holding various engineering positions. He migrated across the United States and ended up at the University of Michigan in Ann Arbor where he was employed in connection with the completion of equipment for a new aerodynamic laboratory and wind tunnel. He also pursued and was awarded the degree of Bachelor of Science in Aeronautical Engineering and later a Master's Degree from Michigan in the same area. From there he was appointed to the position of the Director of the Aeronautical Engineering program at Wichita University. He was one of the few holders of a Master's degree in aeronautical engineering at that time. After Mr. Petroff left W.U. in 1933, he worked for the Curtis Wright Aircraft Company in New York, and the Hughes Aircraft Company in California."

In the fifties, Alex Petroff was persuaded by his former students, Dwane Wallace, Tom Salter, and Jerry Gerteis to return to Wichita to head up the research and development section of Cessna Aircraft where he worked until his retirement. He served as the President of the Wichita Section of the American Rocket Society. In 1960 he worked with the U.S. State Department in Indonesia and in Brazil establishing courses in aeronautical engineering. He died at the age of 74 on September 3, 1971, at his home in La Jolla, California.

One of Mr. Petroff's first major tasks was the construction of a wind tunnel on campus. On December 6, 1928, the University of Wichita Board of Regents appropriated \$1,000.00 for the construction of a wind tunnel under the direction of Professor Petroff. He designed an open-return tunnel which was constructed of wood and lined with aircraft fabric. The tunnel had a open jet four feet in diameter. This open jet test section was enclosed in a small room also occupied by the student operators. The wind tunnel was constructed in the unfinished fourth floor of Science Hall (now, McKinley Hall).

The tunnel was powered by a 60 horsepower electric motor driving a wooden 4-bladed fixed-pitch propeller. The motor was started and controlled using a street-car type controller. Motor speed could be varied from 400 to 860 rpm by use of the controller. Further adjustment of test section wind velocity was made using variable vents downstream of the test section. By opening or closing these vents, more or less air bypassed the test section varying test section velocity.

The balance system was described in an article by J. H. Gerteis and Dwane Wallace and published in the 1933 issue of the CONTACT of Tau Omega:

"The balances are ordinary Fairbanks platform scales with a capacity of 100 pounds and accurate to one-half of an ounce. Recently the rear lift and drag balances have been altered so as to provide an accuracy of one-twentieth of an ounce. The model is suspended (inverted) in the tunnel by the wire balance system, a method that has proved very satisfactory in numerous other tunnels."

"The device for changing the angle of attack is very simple. Establishing the distance between the leading edge and the tail pivot points of the model as 18 inches, the rear left balance platform carries two plates with a series of holes located on the arc of the circle of 18 inches radius so that the distance between two adjacent holes corresponds to one degree. The tail wire of the model is then attached to the pin which fits these holes which are, in turn, numbered in degrees. Thus, by lifting or lowering the pin, the angle of attack of the model can be changed."

Pictures in the PARNASSUS show that the students participated in a glider club, and there were aircraft and an engine test cell on campus. The Engineers Club was supplanted by Tau Omega, the Aeronautical Honorary Fraternity, which was founded in 1927 at the University of Oklahoma. The second chapter was installed at Wichita University on May 14, 1932. Professor Petroff and students are listed as charter members of the Beta chapter of the first Aeronautical Engineering Honorary society.

At the Fourth Annual Commencement of the University of Wichita, on Friday, May 30, 1930, the first five students received the first degrees of Bachelor of Science in Aeronautical Engineering: Virgil H. Adamson, Emerson Hayden Brooks, Jerry Howard Gerteis, Ernest Shih, and Byron Campbell Thayer.

As the Great Depression deepened and the aircraft companies closed, the enrollments in the program decreased. Finally, in the mid-thirties, the program was closed down. Alex Petroff had left the University, as did Jerry Gerteis. Jerry had done a year of graduate work at M.I.T. and then returned to W. U. where he pursued a teacher's degree and also taught in the A.E. program. Other engineering instructors stayed on at the University, including Associate Professor Charles M. "Brownie" Miller and Professor Roy W. Elliott, who also served as University Comptroller. Tau Omega remained active through 1936 and then became inactive. It was reactivated in 1949.

On February 28, 1953, Tau Omega merged with another national aeronautical engineering honorary, Gamma Alpha Rho, to form a new society, Sigma Gamma Tau. It is active to the present time as one of the oldest honorary societies on the campus.



WICHITA STATE UNIVERSITY

THE RAZAK ERA



The Razak Era

The engineering education effort remained in a state of limbo until the rapid expansion of the local aircraft industry during World War II. The local industry asked for engineering courses for their workers, and the Razak era began when C. Kenneth Razak arrived at Wichita University in June, 1943.

Ken Razak (usually called "Kenny" in the forties and fifties) had been raised in the small northwest Kansas agricultural community of Collier. He was valedictorian of his high school class of seven which included three Razaks -- Ken, a sister, and a cousin. The growing-up years of the thirties were dust bowl days. More than once the school was closed down for a week or so. When it was reopened, the dust (blow sand and top soil) had to be shoveled out of the classrooms.

Young Ken Razak attended Kansas University, and during summers he worked in Wichita, first, at Stearman Division of Boeing, and then at Beech. The summer he worked at Beechcraft, he cut all the sheet metal that went on every airplane produced that summer.

One of the ingenious methods of financing his college education was by means of "Montgomery Ward Scholarships" -- a percentage of the price of the orders sent by his mother and neighbors on special Montgomery Ward order forms.

As a result of on-campus work at K.U., Ken became acquainted with one of the Aeronautical instructors, Fred Gustafson, who introduced him to the K.U. Wind Tunnel which was under the stadium. Ken began spending all the time possible in the wind tunnel, and by the time he became a senior, he was teaching wind tunnel testing.

He received his B.S. degree in 1939, stayed as an Instructor, earned the M.S. in 1941, and then was promoted to Assistant Professor. Among the courses he taught was ground school for the Civilian Pilot Training Program (CPTP). In fact, Ken was teaching at the same time that he was taking the course. He came to Wichita University as an Associate Professor in 1943.

Ken taught night classes for the engineers from the plants, and during the day he and a student refurbished the four-foot wind tunnel. This work included removing the thousands of tacks holding the fabric liner to the

tunnel. It was replaced with plywood. The open-throat test section was changed to a closed-throat, and the Fairbanks-Morse balances were replaced with an automatic balance system of his own design and driven by sewing machine motors. Eventually (after the end of the War) the fixed-pitch propeller was replaced by a P-38 electric variable-pitch propeller.

More important was the fact that Ken Razak took charge of the engineering courses and developed a cohesive program leading to the degree of Bachelor of Science in Aeronautical Engineering. Roy Elliott was the nominal director of engineering, and he taught some courses, but his duties as comptroller and ex-officio board member precluded much active direction. Razak became the actual director of the program.

Razak also promoted the close relationship with the local aircraft industry that became a hallmark of engineering education at Wichita University and Wichita State University. As mentioned above, he came to Wichita to teach aeronautical engineering courses because of the requests of Beech and Cessna, and he and other W. U. professors offered the CPTP at Wichita.

The refurbished wind tunnel made it possible for the companies to test models of aircraft proposed for the post-war period. These included Cessna aircraft, for Boeing an experimental constant angle-of-attack plane and its successors, the XL-15 and YL-15, and an attempt to test a model of the Buckminster Fuller Dymaxion house for Beech.

Cooperation with technical societies was fostered. In the March, 1945, issue of the Aeronautical Engineering Review (a publication of the Institute of the Aeronautical Sciences) appeared the following notice:

"An organization meeting of the Wichita Section was held on February 15, 1945 at the University of Wichita. The following officers were elected: Chairman, Jack C. Jones; Vice Chairman, Walter Burnham; Secretary, Kenneth Razak; Treasurer, R. W. Allred. The Advisory Board was elected, comprising Walter Krause, Wilfred Pearce, Herbert DeWess, Dr. P. S. Albright, and Tom Salter."

In addition to Kenneth Razak, Dr. Albright was also a member of the W.U. faculty, being head of the Physics Department. Tom Salter was Chief Engineer of Cessna, and Walter Burnham was a top designer at Beech.

The fiftieth anniversary of the Wichita Section (Now the American Institute of Aeronautics and Astronautics) was celebrated at the University Alumni and Faculty Club and at the Marcus Center on February 15, 1995. Charter members Ken Razak and Bill Pearce attended and were honored.

In the spring semester, 1945, a student chapter of the IAS was established at Wichita University. Carl Prewitt, an engineer at Beech, was the first president. The student chapter has been quite active to the present time.

At the end of World War II, in spring and summer of 1946, three events strongly impacted the engineering program. They were:

1. The G.I. Bill, which paid tuition, books, and a stipend to returning veterans, brought a huge influx of students to the University. A large number of these veterans enrolled in engineering, not necessarily because W.U. had a great reputation as an engineering school, but largely because student spaces in engineering schools were limited. Interest in engineering was promoted by the technical advances during the war. U. S. was victorious largely because we outproduced the enemy.
2. War surplus materiel was made available to colleges and universities. Wichita obtained four fighter aircraft, buildings, machine tools from government-owned plants such as Boeing, and shared with Pittsburg State a box car filled with electronic material.
3. Beech and Cessna decided that they needed a quality wind tunnel, and offered to finance one for the University. When President Jardine asked Ken Razak to state the amount of money he would need to build one, Ken "picked the largest number I could think of (and expect to get) and said \$100,000." It turned out that 100 grand wasn't nearly enough, but he did it anyway.

These three events shaped the future engineering program. It was planned to move engineering to the "East Campus"--a large field west of Yale Street and east of the Crestview Country Club and between 18th Street and 21st Street. Razak shared an office in the Aviation Building (now know as Industrial Arts) with John Gaddis, head of Buildings and Grounds, and listed as an engineering professor. Also in the building were two classrooms, the engineering shop, shop office, and tool crib.

At this time, shop courses, including machine shop, foundry, and welding, were a part of engineering curricula at American universities. Razak believed that the students would benefit from being associated with a working shop. He put John Allen, formerly a tool shop supervisor at Boeing, in charge of the shop. Johnny manned the shop with tool-and-die machinists, including Forrest Olsen, George Gerards, and Hubert Crane. These highly-skilled machinists were "on soft money", their salaries being paid for by the tool and die work done for local industry. In the early fifties, this contract work was decreased because of complaints by local machine shops. By that time, however, much of their effort was needed for wind tunnel model making.

The first building erected on the East Campus was a triple Quonset hut that housed the shops. When the pre-fab parts for the Quonset were delivered, Ken Razak, eager to site the building, paced off the foundation and stuck some stakes in the ground to see how it would look with respect to the roads and the site for the wind tunnel. He was later chagrined to discover that the contractor poured the footings for the building using his stakes rather than surveying it. The result was that the building was not truly east-west, north-south; it was off by about 1.5 degrees. This fact bothered Ken who, like many persons raised in Kansas, lived by the cardinal points of the compass. Years later, when a laboratory addition was made to the building, a west curtain wall was added that was truly north-south.

When the machine shop and welding shop were moved to the East Campus Quonset in the summer 1947, an aluminum foundry and pattern making shop were added. Pattern making, taught by Charles Newman became the core of the wind tunnel model shop. Charlie Newman, a favorite of the students as well as the workers, became the shop supervisor and devised methods of building models for the tunnel, as well as modifications to the tunnel itself.

The sheet metal building was made quite usable by the use of radiant heating; hot water was circulated through pipes in the concrete floor. The walls were lined with B-29 insulation obtained from war surplus stocks at Boeing.

The new wind tunnel was built east of the Quonset hut, and a former PX building from Camp Crowder was built north of it. This latter

building was used as laboratories for electricity, internal-combustion engines, structures, and heat-power. Also, a classroom and a group of offices were housed in the one story frame building.

In order to plan for construction of the wind tunnel, Ken Razak and M. Jerry Gordon, Beech aerodynamicist, traveled around the country visiting wind tunnel installations. They decided on the 7 ft. x 10 ft. test section size because of the extensive NACA experience with tunnels of that size. They quickly discovered how little money they had to work with -- the Pittsburgh DeMoines Steel Company wanted \$25,000 for just the design drawings.

Decisions were made. It was decided to use reinforced concrete rather than steel. This was a difficult problem because it was too expensive to make the tube separate from the foundation. Since the tube and foundation would expand and contract at different rates, because of their different temperatures, there was a problem of expansion joints. It was decided to put enough steel in the concrete to hold the chunks together after they had gone through an annual temperature cycle.

Razak, with the aid of a 1/12 scale model, did the aerodynamic design of the tunnel. Al Masterson, a Kansas City structural engineer, designed the tunnel structure. B. W. (Bud) Grant, a grain elevator builder, was foreman of the job. His main regret was that he couldn't slip-form the tunnel. The lower part (roughly one-third of the tube) and the foundation were poured. The upper part of the tube was formed by the gunite process. The designer put a rolled-channel ring every four feet along the tube to maintain the circular shape. A year later, there was a crack every four feet which was then waterproofed, so that there were many expansion joints instead of one.

It is tempting to discuss the balance system and its evolution, but suffice it to say that it is a six-component pyramidal balance. The individual balances for each component made use of surplus electronic gear. The out-of-balance sensors and cursor drive motors were from B-17 autopilots. Originally, the balances were stopped at each test point and readings recorded by hand. There have been three generations of data acquisition hardware, and today, high speed data gathering, processing, and tabular and graphic presentation of results are all on-line.

The initial powerplants for the tunnel were Allison V-1710 (12

cylinder, liquid cooled) engines; the first used were removed from P-63 fighters. It required an engine operator in the powerplant room connected to the tunnel operator by intercom. Paul Smith was the mechanic who installed and operated the engines. Later, when sufficient transmission line capacity reached East Campus, the engines were replaced by an electric motor.

I discovered the Aeronautical Engineering department at W. U. through a series of coincidences. I had studied Mechanical Engineering (Aeronautical Option) at the Carnegie Institute of Technology in Pittsburgh, PA. With about a year to complete degree requirements, I entered the Army in 1943. I had completed four years of Corps of Engineers R.O.T.C. and transferred to the Army Air Corps before reporting to O.C.S. in Miami.

At the end of WW II, I returned to Carnegie Tech (still on the trimester system), completed requirements for my degree, and graduated February 1, 1947. During the summer of 1946, I purchased a copy of Flying magazine, which included an article on graduate study in aeronautical engineering, with a listing of universities offering graduate work in A. E. I wrote letters of application for graduate study to about a half-dozen of the schools. Because of my concern about the crowding of the colleges because of the G. I. Bill, I told, in the letter of application, about my experience as an aircraft engineering officer with a P-47 fighter group and with a B-17 repair depot. I was surprised to receive an invitation from Ken Razak to visit Wichita and consider teaching at W. U.

The cleanliness of the city and campus was a marked contrast with coal-black Pittsburgh. The testing of an L-15 model for Boeing in the 4-foot wind tunnel and the construction of the 7 x 10 tunnel convinced me that this is where I wanted to be -- at least for a while. I had no intention of staying; I just was going to teach until I earned my master's degree. I met my first class on February 10, 1947, and I retired in May, 1992.

The faculty which I joined consisted of:

Kenneth Razak, department head
C. Robert Gottlieb, mechanics & structures
Roland O. Byers and William Nagel, who taught engineering drawing
Charles "Brownie" Miller, drawing, kinematics, and statics
John S. Allen, who directed the shop and taught shop courses
D. D. Ward, welding.

My schedule for spring semester, 1947, included thermodynamics, fluid mechanics, internal combustion engines, and kinematics. In the fall, aerodynamics replaced kinematics.

We used the two classrooms in the Aviation building. Above the classrooms was an attic where much of the government surplus was stored. It was disturbing to hear persons moving around on the rafters above the class. One day, as I was lecturing to the engines class, a student above slipped, and his leg came through the ceiling. Fortunately, he caught the rafter beams, and the rest of the student did not fall through.

When his companions pulled him back up to the storage room, they all started laughing, and a couple of them put their heads through the hole, asking whether they had interrupted the class. This class session was not a profitable one.

At first, my 'desk' was a little space at the end of a drafting board occupied by a draftsman designing the wind tunnel. A few weeks later, Bob Gottlieb and I were given a very small office to share. Space was at such a premium that we had to share our cramped quarters with Paul Morris and his drafting table.

Sharing an office with Bob Gottlieb was interesting, to say the least. He had served in the Pacific as gunnery officer on a Navy supply ship, and he could really spin a yarn. His stories included pre-war service on a banana boat, service at Eniwetok during the atom bomb tests, and wartime service including the tale about the island hospital overlooking the harbor where the nurse's shower was visible through the ship's telescopes and range finder--and this was before Mr. Roberts was published.

Bob had joined the faculty the semester before I had. He was a relative of President Jardine, and when he arrived in Wichita, he stayed at the President's residence while house hunting. President Jardine was in Hawaii recuperating from an illness, but Bob had a key and admitted himself. Apparently, John Gaddis had rigged a burglar alarm which went off. It was reported that a component of the alarm was a mortar shell, and the plaster was blown off the hall ceiling.

Most of the students that first semester were veterans, about my age and a few older than I. It was challenging to be their teacher -- in some

cases, a bit scary. One student, Dan Bird, watched me so intently, while I lectured, that I thought he was waiting for me to make an error so he could pounce on me. I found out later he was just interested in what I was saying.

In the Spring semester of 1947, Dr. Jardine returned from Hawaii and the Post-War Planning Committee reported to the faculty. This Committee, chaired by Dr. Lloyd McKinley, was charged with the task of examining the curricula of the University. In making his report, Dr. McKinley stated that, for every proposal, Dr. Cecil Read supplied hypothetical examples, Dr. Forrest Whan argued all objections, and Dr. P. S. Albright saw to it that no measure passed unanimously.

The committee proposed a number of minimum requirements for all Bachelor degrees offered by the University. These requirements included:

- 6 hours Freshman English
- 2 hours Speech
- Political Science 201 (Introduction to Citizenship)
- 120 hours plus 4 hours of Physical Education or R.O.T.C.

Dr. Robert Mood objected to the physical education requirement saying that, "I get all the exercise I need acting as pall bearer for my friends who exercise." After considerable discussion, the Committee report was adopted by the faculty.

The requirement for graduation in Aeronautical engineering was 140 hours plus 4 hours of R.O.T.C. or P.E. The veterans received at least 4 hours of credit for their military service. Beginning in 1949, the A. E. students were required to satisfy the four-hour requirement with Basic (i.e., first two years) Air Force R.O.T.C. (instead of physical ed. or Army R.O.T.C.). The justification for this ruling was that the Air Force was the largest customer of the aircraft industry which would be the employer of the graduates. More than a decade later, the Army Professor of Military Science and Tactics (R.O.T.C.) objected strenuously to the rule and forced a change in policy. During the anti-militaristic decades of the sixties and seventies enrollment in R.O.T.C. became so low that both Air Force and Army R.O.T.C. programs were withdrawn from the campus.

The first post-war class of engineers graduated in Spring, 1948. It consisted of:

Bachelor of Science in Aeronautical Engineering

Dan Bird	Jerry Dinoff	Paul Morris
Bob Burnham	Jack Fisher	John Nunemaker
	Earl Parsons	

Master of Science

Melvin L. Falk

In those times the entire faculty met after final grades were in and voted approval of the list of graduates before commencement. Commencement was held in the Commons auditorium (now, Wilner Auditorium). The faculty sat on the stage and the graduates and family members in the auditorium seats. My first Commencement was memorable. President William Jardine (who had been Secretary of Agriculture in President Coolidge's Cabinet) had invited a corporation president who had also been a friend of the Coolidges, to be the principal speaker. There was no air conditioning, and it was a sunny day in May. The speaker went on at length telling about the Coolidges--"Cal this and Grace that". He said, "I could talk forever about them". An audible murmur went through the audience -- we were afraid he really was going to do it.

The auditorium and another procession in academic costume remains in my memory. President Jardine retired in 1949. Nominations for president were solicited throughout the academic world. The reply from the president of the University of Chicago was that the best man for the job was on the Wichita Faculty -- Harry F. Corbin, Associate Professor of Political Science. There was, however, a triumvirate of faculty members which had its own slate. Apparently Earl Davis, head of the English department, and Forrest Whan, head of the speech department, were both candidates for president. Professor Whan threw his support to Davis. Max Milbourn, assistant to President Jardine for public relations was the third member of this group.

Harry Corbin was elected President by one vote, that vote being cast by a newly-appointed member of the Board of Regents. Davis and Milbourn went to Kansas State, and Whan went to Texas.

When Harry Corbin was inaugurated, it was again a warm and sultry day. There was a procession in academic costume with visitors to campus

representing colleges and universities throughout the country. The day before the event, the Buildings and Grounds crew had spread many truckloads of fertilizer from the city sewage plant on all of the campus lawns. On the morning of the celebratory day, the spring air was rank and fetid. It is reported that John Gaddis, Superintendent of Buildings and Grounds, was asked why he had spread that stuff around. His reply was, "I didn't want all those folks to think that this was a one-horse college".

I was interested to note that as soon as it was rumoed that Harry Corbin was being considered for president, Ken Razak brought him over to the wind tunnel to see what was happening.

What was happening was that a research activity had started, supported by the 7 x 10 wind tunnel and, in turn, supporting a "soft money" staff. In order to complete the balance system and the control room, Razak obtained money from the Kansas Corporation Commission and the Women's Aeronautical Association. The first tunnel test was a test of full-sized automobiles sponsored by the Nash Motor Company. In the late forties, the Nash body style was best described as an "upside down bathtub". Their unitized body contrasted with the GM cars with the large fenders, notch backs, and tail fins. The tests were sponsored by the advertising department rather than the engineering department. We came to feel that they felt that the definition of streamlining was "the smooth passage of the eye from the front to the rear of the car" -- no mention of air.

Originally, it was planned to compare the Nash Ambassador with the "other big four"--the Cadillac, Packard, Chrysler Imperial, and Lincoln. The first tests showed the Nash to be aerodynamically superior (i.e., less drag), so all 1949 body styles were tested (all American manufacturers).

After a couple of years advertising their aerodynamic superiority, the Nash Company switched to the GM design philosophy. They had printed thousands of the wind tunnel reports for their dealers and others. When they changed their style, they shipped all those reports back to us.

The important result of these first tests was that the wind tunnel laboratory became operational with an experienced crew and with many of the "bugs" worked out of the system.

Dean Razak developed a working arrangement with the Office of Naval Research (O.N.R.) for the study of the use of energy to enable airfoils to develop higher lift coefficients. The result was more than a decade of sponsorship by the O.N.R. of study of boundary layer control and circulation control. Mississippi State worked with area suction, and W.U. investigated suction on the airfoils and blowing over the flap surfaces through finite-width slots. Much of the basic and applied research on boundary layer control was done at Wichita. Also, in June 1955, a short course was taught including lectures by Phillippe Poisson-Quinton of the French ONERA, and Professor Heinrich Helmbold and Frederick Wagner, two German scientists, who were members of the W.U. Engineering Research department and who had been supplied by the O.N.R. through "Operation Paperclip". Another effort was the cooperative development, with Cessna, of a circulation-control flight demonstration airplane.

This research program was very important to the School of Engineering, not only for the research experience and training of the faculty and graduate students, but also for the reputation of the University in the academic community. During the fifties, a Department of Engineering Research was built up, initially headed by Virgil Razak and later by Robert K. Wattson.

In school year 1947-48 the first Engineering Laboratory building was erected on the East Campus next to the Shop building. It consisted of a frame PX building (75' x 144') which had been removed from Camp Crowder and transported to the site on the Wichita University campus at a cost of \$9,527. It was initially used as offices for the engineering professors, and as a laboratory for materials testing, internal combustion engines, and laboratory methods. Also in January of 1947, the four foot wind tunnel was moved from Science Hall to the East Campus.

Not all of the engineering students wanted to be aeronautical engineers. There were a number of requests for other fields. The University had a strong Chemistry department, but a Chemical engineering program would require a large amount of additional expensive laboratory equipment. Similar problems faced other fields.

Some interest was expressed in Industrial Engineering, and at that time, the laboratory requirements in that field were stop watches and clip boards in addition to the excellent machine shop and foundry already on hand.

In 1949, H. Lawrence Hall, an industrial engineer, joined the staff to inaugurate a four-year Industrial Engineering program, and the first B.S. in I.E. degrees were given in 1950. The offices of the Industrial Engineering department were also moved into the Laboratory building. Partly as a result of the first ECPD inspection of the Aeronautical Engineering curriculum, the Department of Engineering was changed to the School of Engineering headed by a Director -- Kenneth Razak. Included were the two degree-granting departments of Aeronautical Engineering and Industrial Engineering and the departments of Engineering Drawing, Engineering Sciences, and Engineering Shops and Industrial Arts.

ECPD, Engineering Council for Professional Development, was the accrediting agency for engineering curricula. It is now Accrediting Board for Engineering and Technology -- ABET.

In 1950 Neff Hall was constructed, and at this time Kenneth Razak was named Acting Dean of the College of Business Administration and Industry, and his office was moved to Neff Hall, relieving the press for space in the Engineering Laboratory building to some extent. Also, aircraft design classes and machine design classes were conducted in one of the classrooms in the ROTC building. Engineering Drawing classes were conducted from 1946 until the construction of the Engineering Building in rooms located in the basement of Morrison Library.

In 1950 the School of Engineering was confronted with the problems of attempting to retain faculty members and of declining student enrollment. The problem of retention of faculty was highlighted by the resignation of Professor Miller, who after eighteen years of loyal service to the University, resigned to take a job at Beechcraft (at a significant increase in salary). A meeting was held in the home of Ken Razak to decide whether to close the School of Engineering or to seek some drastic solution to the problems. It was decided to attempt to increase the enrollment by offering a majority of the classes on an evening schedule.

The class offerings were such that undergraduate courses were offered both in daytime and night classes. A student could earn a degree by taking all day classes, all night classes, or a combination of both. The engineering graduate classes were, for a number of years, given at night only.

This was a time of full employment of engineers, and this plan worked well. There were many draftsmen, technicians, and engineers in the plants who had not completed their BS degrees. They were able to do so by attending night classes at W.U.

Also, recruiters at the aircraft companies used our night program of graduate courses as one of the inducements to attract new graduates (ours and those from other schools) to join their companies.

As an example, the Spartan School of Aeronautics in Tulsa was closing their aeronautical engineering program. I went with Roy Kunz, the Beech engineering recruiter, to Tulsa. He talked to the students about employment at Beech, and I explained how they could complete a B. S. degree at W.U. at night. We managed to bring about a dozen young men to Wichita. They included Bob Crawshaw, later Flight Test Director at Cessna; Bruce Peterman, later Executive Vice President of Cessna; and Everett Cook who became a valuable longtime faculty member at W.S.U. and then went on to other careers at Learjet, OMAC, and Raytheon.

The plan resulted in increased student enrollment, and it was possible to obtain a significant raise in salaries of engineering faculty members so that these members could be retained at the university. As a result of the success of evening courses in engineering and our pressure on supporting departments, there was an expansion of offerings in all departments of the university. There has been an active evening school program since that time.

In 1952 departments of Civil Engineering and Mechanical Engineering were added. Leonard Rastrelli headed the Civil Engineering department, later joined by Walter Bernhart. Walt later became a valued member of the A. E. department. He was a utility infielder, i.e., he was the most versatile faculty member in engineering. Among other things, he introduced the faculty to computers.

The Mechanical Engineering department was headed by one of the most memorable professors in our history, John W. Dunn. Jack Dunn had graduated from the University of Cincinnati in 1932 with the professional degree (i.e., 5-year degree) of Chemical Engineer. He eventually became the metallurgist at Cessna Aircraft with a hobby of electricity. Ken Razak employed him as a Lecturer to teach the electrical courses. In 1948, Jack

joined the Engineering faculty full time and added the Materials lab to his responsibilities.

When Jack Dunn took on the job of Head of Mechanical Engineering, he immersed himself in thermodynamics and heat power. He took over (from me) the teaching of thermodynamics and even read the life of Willard Gibbs. Still today, former students speak, with awe and trembling, about his thermodynamics course. One student, who received a D, asked, "Professor Dunn, should I repeat thermodynamics?" "Why no, Mr. -----, if I wanted you to take it again, I would have given you an F." He was quite formal in class, always addressed the students as Mr. -----. Jack was an interesting officemate, who entertained me with endless stories. An inveterate patron of surplus stores, he soon produced a heat power lab with an impulse steam turbine and a uniflow engine. The M.E. department was accredited by E.C.P.D. in 1960.

In 1952, the School of Engineering separated from the Business Administration College. A new Dean of the College of Business Administration was named, and Ken Razak became Dean of the School of Engineering. A building for the School of Engineering was erected in 1952-53, providing office space for the faculty, three classrooms, three engineering drawing rooms, and two design rooms. Originally there was an engineering library, but this space was gradually taken over by offices as the number of engineering faculty increased. In 1957 it became apparent that the enrollment in Civil engineering was decreasing to the point where it was impossible to justify the necessary laboratories for this department, and, as a result, the department was closed. The last major in Civil engineering was graduated in 1959. At about the same time, a department of Electrical Engineering was established in response to the demands from students, and the department was accredited in 1961.

Immediately after World War II, the engineering programs were education in the "art of engineering". Our program was typical. It required four hours of shop courses and only a minimum of humanistic or social studies courses. Design courses were included. The first post-war seniors designed a Goodyear Trophy racing plane which was built by two mechanics in the Laboratory building. The students, in their classes, produced the construction drawings and proof-loaded parts, such as the wing and the carry-through structure. Needless to say, the plane's progress in the National Air Races during the summer was closely followed.

One of the first steps in transition from teaching the art of engineering to teaching the science of engineering was the employment, in 1954, of our first Ph.D. engineering professor, John Ruptash. John was an energetic, somewhat feisty, Canadian from Hairy Hill, Alberta. He received his doctor's degree from the Institute of Aero-Physics at the University of Toronto. His first assignment was to take charge of the graduate program in A.E. In 1950, six of us received the M.S. in Aeronautical Engineering. Our programs of study were about one-half participation in sponsored or unsponsored research programs, and the rest were Math and Physics courses, although Ken Razak did develop a supersonic aerodynamics course -- probably the first one taught in Kansas.

John Ruptash developed three courses that became the basic part of the graduate program: Aerodynamics of Incompressible Fluids, Aerodynamics of Compressible Fluids, and Aerodynamics of Viscous Fluids. These courses, or modifications of them, have been part of the graduate program to the present.

Dr. Ruptash taught these courses at night. For years the graduate courses were all taught at night, and even today, a major part of the graduate work is in late afternoon or evening classes. In the evenings, after class, John and his students would continue their discussions/arguments, sometimes until 1 or 2 a.m. He also liked to involve the undergraduates in his discussions, sometimes telling about student activities in Canada.

Partly as a result of his stories, the students organized an Engineering Council. One of this group's first activities was to steal a large rock that had been on the lawn of old Fairmount Hall, and later in front of the Commons (now Wilner), and to plant it at the south entrance of the Engineering building. On the Saturday that this nefarious act was committed, there was a paving company pouring new concrete sidewalks on campus. The students talked the men out of a wheelbarrow-load of concrete so that the rock was well planted. They also had prepared a bronze tablet which is mounted on the rock and can be viewed to this day. The students involved were members of the class of 1955 and included Bill Wentz and Richard Ross (both later A. E. faculty members), Fred Wierum (later at M.I.T.), Ed Eastham, and others whose names have faded from my memory.

The Engineering Council organized, regularly elected officers, and was largely responsible for the development of an esprit de corps of the Engineering School. They took over the annual Engineering Open House which Dean Razak had initiated in 1950. Associated with the Open House was the annual Engineering Banquet, usually held on campus. Some Open House project awards were given, but the main emphasis was fun. Usually there was a competition of some sort. Regularly, Roy Norris had an entry which tried to take advantage of some loophole in the rules. Each year the students attempted to write the rules to defeat him, but each year he managed to find a new loophole.

In March each year, the students would manage to ascend the roof of Morrison Hall and decorate the clock faces with large shamrocks. This was a signal that engineering classes were cancelled, and the St. Patrick's picnic would be held with food and games. Most years the campus cops would arrest the roof climbers, but they would release them in time for the lunch.

Our first step into experimental supersonic aerodynamics was taken when John Ruptash designed a small vacuum-driven supersonic wind tunnel. It was designed for Mach 2 airflow through the 20 square inch test section. This tunnel was a joy for undergraduates to work with -- the highest pressure was atmospheric pressure, so they weren't going to hurt themselves -- although they did accomplish a lot of dumb things like sucking a pair of coveralls into the vacuum tank.

Several years later when the Boeing Company failed to land the F-111 contract, a decision was made to close down most of their Wichita experimental facilities which included a research quality pressure blowdown tunnel with a 9 in. by 9 in. test section. It was about to be shipped to Kansas State University when Richard Holloway, the supervisor of the Aerodynamics and Propulsion group at Boeing heard of it and arranged to have it donated to W.U. instead.

Dick Holloway (B.S. in I.E. and M.S. in A. E. from Wichita, and also Masters in Library Science from Illinois) is one of the staunchest supporters of our College of Engineering. I particularly liked the way he strongly supported W.S.U. graduates when hiring for Boeing.

The engineering curricula of the late forties and early fifties was that which accommodated the requirements of the Post-War Planning Committee Report adopted in Spring of 1947. Adherence was guaranteed by the fact that there was a single Curriculum Committee for the entire University which had to approve of all programs and changes, additions, or deletions of courses. There was continual pressure for more definitive specifications of the basic University degree requirements. Many of the engineering faculty felt that the Liberal Arts faction was trying to dominate the entire University. I was not as concerned as many; I had done my work under President Robert E. Doherty at Carnegie Tech. Doherty was one of the leaders of the movement to increase the humanistic and social component of the engineering curricula.

In 1954, a Committee on the Basic Curriculum studied and proposed a new University Core Program which was adopted by the Faculty. The committee had spent a year defining the objectives of General Education, but when it came to determining which courses satisfied these objectives, the department politics dominated the discussion, and the desire of each department to maximize student credit hours taught sabotaged the idealistic goals. It is small wonder that within three years a new self-study committee was appointed to revise the Core.

President Corbin appointed a self-study committee (Gerry Hammond called us the "Buddha Committee") to study the general education program. Geologist Robert Berg, chairman of the University Curriculum committee, chaired this committee which included representatives from each of the colleges, and Harry Corbin also met with us.

It took more than two years to produce a new University Core program. It was rejected the first time that it was presented to the faculty. The part of the plan which has survived to this day was the establishment of a University College to which all entering freshmen were to be admitted. As originally planned, W.U. would offer large sections (taught by the best lecture/scholars), such as "Man and the Biological World", "Man and the Social World", and "Man and the Fine Arts" plus English 111. After completion of these courses, students could apply for admission to degree-granting colleges. This concept of a "University College" was proposed and vigorously promoted by committee member Jackson O. Powell, Dean of Education.

University College still exists, although the College of Engineering bypasses many of its functions, particularly counseling of students.

The immediate effect of the new core program was that it required 45 hours, compared with twenty-nine to thirty-six previously, and distribution requirements spanned five general areas--math and general sciences, communications, humanities, social sciences, and physical activities.

Thus, in 1958, a new crisis faced the School of Engineering as a result of the adoption by the university faculty of this University Core Curriculum which increased the number of non-technical elective courses from about 12 hours to a minimum of 24 hours. Since the necessity to include this additional number of hours in the engineering program required that the engineering curriculum be revised, Dean Razak and the faculty of the School of Engineering decided that this was an opportunity to examine the entire philosophy of engineering education at the University of Wichita.

This need for reexamination of our programs was also pointed up by the fact that, in 1957, Aeronautical Engineering was reaccredited by the ECPD for only two years, and Mechanical Engineering and Industrial Engineering were denied accreditation. Aeronautical Engineering had originally been accredited in 1949 and reaccredited in 1953.

The entire engineering faculty debated the problems and philosophy of engineering education and established the basis of what was referred to as a new program in engineering education. "Goals of Engineering Education" were debated and formulated and then we started from scratch to devise courses to attain the goals. Much of the new approach was proposed by Dr. Arthur T. Murphy, the new Electrical Engineering department head from Carnegie Tech. The debate began in the summer of 1957, and general agreement was obtained during spring semester of 1958. It was agreed that the program should require that all of graduates should be engineers first, and that there were certain levels of knowledge and skills to be attained by all. Following that foundation, specialization in a field could be begun in the senior year (and in graduate school for some). The details of the courses of this program were worked out by a committee consisting of Professors Murphy, Rastrelli, Aldrich, and Snyder, and were ratified by the engineering faculty in November 1958.

This new program consisted of 46 hours of University Core courses, including 24 hours of humanities and social science, 76 hours of Engineering Core courses, and 22 hours of department courses.

Fortunately, I had been a member of the University Curriculum committee for some time and also served as chairman. As Acting Dean of Engineering in 1959, I was able to sell the committee which approved the program.

Revising the engineering curriculum and courses was one step in the transition from the art of engineering to the science of engineering. The other component is the upgrading of the faculty. We had some Ph.D. faculty members (Art Murphy, John Ruptash, Bob Schrag, Barney McCormick, Win Dalley, and Gordon McKay) in the 1950's, and they were the leaven in the dough.

Andrew Jack Craig (Jack to his engineer associates, Andy to the rest of the campus) joined the Engineering Research department as a test pilot, earned an M.S., and became one of the most dynamic (even, charismatic) professors in the Aeronautical Engineering department. Jack went off to Stanford to earn a Ph.D., and Walt Bernhart took leave to go to Oklahoma State for the same goal.

On October 4, 1957, the Soviet Union launched the first man-made earth satellite into orbit. The first U.S. satellite, Explorer I, went up four months later. These events had national and international impact -- political and military. There was also local impact. For example, Ken Razak and I appeared on the new Wichita television station explaining how rockets worked and how a satellite could remain in orbit. Also, the A.E. department presented to an evening class of hundreds of students a NASA-made film course on space flight.

One of the reactions to Sputnik that improved the quality of U.S. engineering education was the establishment by the National Science Foundation of the Science Faculty Fellowship Program. One plan financed math, science, and engineering faculty to take advanced courses in the summers. Another program was the awarding of fellowships (12- or 15-month) to work on advanced degrees. The fellowship paid tuition and the fellows were paid a salary which was the same as their income for the

previous year, tax free. This generous support made it possible for faculty with families (in my case, a wife and four children) to take a leave and move to a college of choice.

Many of us at W.U. earned our PhD degrees at Oklahoma State University. It was the nearest school with a good graduate program, and the Graduate Office worked with the students in developing reasonable graduate programs. We quickly discovered that those who asked Dean of Faculties Emory Lindquist to write letters of recommendation were successful in applying for a fellowship. Those who took advantage of this program included Everett Cook, Mel Snyder, and Bill Wentz in A.E., Howard Hamilton and Roy Norris in E.E., and John Leslie in I.E. When Jack Craig returned from Stanford, he brought two other new Ph.D.'s with him, Walt Eversman and Don Higdon.

In the mid-fifties the Engineering Research department, which was a separate research activity within the School of Engineering, built a one story brick addition to the Engineering Shop building. A portion of this addition was equipped as an electrical and electronics laboratory, and the remainder as offices for the Engineering Research department. Also, a partial second floor was built in the Quonset hut for use as a drafting room. In 1961 the Engineering Research department, because sponsored research was becoming more difficult to obtain, was forced to solicit ordinary testing programs just to meet the payroll. The Department was closed, and the offices were converted to offices for the Aeronautical Engineering department, relieving the office situation in the Engineering building.

The Honors Convocation was started in 1954 as a method to pay special honor to students who had attained a high academic record. A special convocation was held with the honor students on the stage. A special speaker, usually one of the University's top professors, gave an appropriate address. Then students were presented to the audience of faculty, students, and families and friends of the honorees. In the evening, a banquet was given for the students and their parents.

In the Spring of 1959, I was the Chairman of the Honors Convocation Committee. It was my duty to design the printed program, arrange for the banquet, the program, and the convocation speaker, and serve as M.C. at the banquet. The new Campus Activity Center had just

been finished, and I booked the ballroom for the dinner. I was assured that although this would be the first event in the new facility, it would be ready.

The convocation went well. In the evening, when the students and their parents arrived at the ballroom, the doors were locked. Investigating, I found that the tables had not been set, but a very small staff was working at it. When the almost 200 people were admitted, there were only two or three waiters. We ended up with the President's wife, Sally Corbin, Dean of Women Josephine Fugate, Asst. Registrar Laura Cross and other volunteers waiting tables. Fortunately, most persons were good natured, but the Do-It-Yourself Honors Banquet was a real embarrassment for me.

In Spring, 1963, the bill to make Wichita University a state university finally was approved by the State Legislature. Again, as in 1926, the citizens of Wichita voted. They overwhelmingly approved the incorporation of the University of Wichita into the state education system by a 96.7 percent majority in May, 1963. On July 1, 1964, Wichita State University entered the state system. This was the culmination of years of work by President Harry F. Corbin, who on May 18, 1963, resigned the presidency of the University of Wichita. In Uncloistered Halls, Craig Miner stated " He was the University's greatest visionary since Morrison and maybe the greatest motivator and fighter ever".

Harry Corbin was succeeded by Emory Lindquist. Emory was the ideal man to preside over the transition from W.U. to W.S.U. and to heal the personal and regional political wounds resulting from the fight. He was a respected scholar and a fine Christian gentleman.

Kenneth Razak also decided to leave the university. Colon Dunn, Head of the Electrical Engineering department, served as Acting Dean in 1964-65. Razak went on to design and build a revolutionary agricultural airplane called the Distributor Wing airplane. He spent a few years at Kansas State University developing an industrial extension system. He also did accident investigation and expert witness work, and today he is probably the leading expert on railroad accidents.

The changes that occurred were more than just a change in the University's name. There was a feeling among the faculty that we were

now the peers of those at K.U. and K.S.U. Apparently, there was also a similar feeling among the public. The addition of "State" to the University's name (and the reduction in the tuition cost) resulted in a sudden jump in enrollment.

I was in residence at Oklahoma State University during the changeover and missed much of the turmoil. Jack Craig returned from Stanford with his Ph.D. and took my place as A.E. department head.



THE JAKOWATZ ERA



The Jakowatz Era

During the Academic Year, 1964-65, a search was made for a new dean. The Faculty Committee finally recommended to President Emory Lindquist that the position be offered to Dr. Charles V. Jakowatz. Dr. Jakowatz was an electrical engineer employed in the research laboratory of General Electric at Schenectady, N.Y. He had midwest connections, having been born and raised in Kansas City. His B.S.E.E. and M.S.E.E. were earned at Kansas State University, and he was a member of the K State faculty at one time. His Ph.D. degree was obtained at the University of Illinois.

Dean Charles Jakowatz's two major accomplishments were important steps toward the College of Engineering which we have now. They were the building of Wallace Hall and the beginning of the PhD graduate program.

The planning, financing, and construction of Wallace Hall was a great accomplishment. Wallace Hall was named to honor Dwane L. and Velma Lunt Wallace. Dwane Wallace was a 1933 graduate of the W. U. Aeronautical Engineering program. He became General Manager of the Cessna plant in January, 1934, and from 1936 to 1975, he served as Chief Executive Officer of Cessna Aircraft Company.

The support of Dwane Wallace enabled the university to obtain sufficient state money to build a much-needed laboratory building. Also, in May, 1976, the Dwane L. and Velma Lunt Wallace Fund was established at W.S.U. to support scholarships and graduate fellowships for engineering students, and to purchase equipment needed by the College of Engineering.

Wallace Hall, dedicated April 22, 1977, added 78,204 square feet of space for laboratories, offices, and classrooms (including a lecture hall). The Dean's offices and the Aeronautical and Electrical Engineering offices were moved into Wallace Hall. Most of the space was used for thirty laboratories for the four departments. Also, a replacement for the old four-foot tunnel was built as part of the building. The building was wrapped around the Beech Wind Tunnel and additional workrooms were provided for the tunnel. A new Engineering Shop was also included.

Moving into the new building was a glorious day. We felt that now we really were on a par with K.U. and K. State. It was a proud time for us, and we were happy to serve as hosts of the Mid-West Section of the ASEE.

Another change that occurred when we went into the state system was that the School of Engineering became the College of Engineering.

Jack Craig began talking about offering the doctor's degree in aeronautical engineering. He pointed out that we had the best aeronautical laboratory equipment in Kansas and excellent library holdings. He and the other Stanford Ph.D.'s were eager to go.

K.U. and K.S.U. were not enthusiastic, but when I returned from my leave at Oklahoma State, a proposal had been floated. At first, I was not involved. Since W.S.U. had the best wind tunnel in the midwest, I received permission to do the experimental work for my dissertation in that tunnel. I completed my dissertation and received the Ph.D. degree at Stillwater in May, 1967 -- twenty years after receiving my bachelor's degree at Carnegie Tech and 17 years after the M. S. at W. U.

My advisor at O.S.U. was Glen Zumwalt. He was planning to take a two-year leave of absence to teach at a university in Egypt, and he proposed that I take his place on the faculty at Oklahoma State. However, a brief war between Israel and Egypt in June, 1967, caused a disruption in the diplomatic ties between the U.S. and the Arab countries and scuttled Dr. Zumwalt's plans. Another problem erupted closer to home. Jack Craig had resigned as department head, and the Dean asked me to take the job.

When Wichita University became a part of the State system, it was provided that it should be a university with its existing Baccalaureate, Masters, and single Ph.D. program (Logopedics), continuing to lead to degrees awarded in its own name. The legislation provided that Wichita State University should be an Associate University of the University of Kansas and that further doctoral programs at Wichita should be developed cooperatively with K.U. and that the degrees should be University of Kansas degrees.

In June, 1966, the K.U. Chancellor and the W.S.U. President, with their staffs, met to discuss cooperative arrangements. Among other

things, it was decided that cooperative doctoral programs at Wichita should be developed in selected areas. The W.S.U. Graduate Council designated the Department of Aeronautical Engineering as one of five departments most ready to begin planning doctoral programs.

To provide the manpower to offer such a graduate program, two steps were taken: (a) Dean Jakowatz obtained authorization to add two Distinguished Professors in Aeronautical Engineering, and (b) the Department of Mechanics and Materials was merged into the Aeronautical Engineering Department. On my recommendation, Dr. Glen Zumwalt was named the first Distinguished Professor. These actions provided us with a staff of:

Distinguished Professor

Dr. Glen W. Zumwalt

Professors

Dr. Walter Bernhart

Dr. Andrew J. Craig

Dr. Melvin H. Snyder, Chairman

Associate Professors

Dr. Everett L. Cook (hired him back from O.S.U., January, 1969)

Dr. Walter Eversman

Dr. Bert L. Smith

Assistant Professors

Professor Herb H. Coin

Dr. Robert S. Goudy

Dr. David E. McFarland

Dr. William H. Wentz

With the able assistance of Glen Zumwalt, I put together a proposal for "A new program of studies leading to the degree of Doctor of Philosophy to be offered jointly by the Department of Aerospace

Engineering, University of Kansas, and the Department of Aeronautical Engineering, Wichita State University", dated August, 1968, and revised January, 1969.

The program was finally approved by the Board of Regents, and we embarked on a new venture. The first year, there was an exchange of faculty. Dr. Jan Roskam flew to Wichita once a week to teach aerodynamics courses (and to build up flying time), and Dr. A. J. Craig took up residence in Lawrence where he taught stability and control courses (and courted his wife-to-be). The committees for the students were composed of members from both institutions; we sometimes met midway on the Emporia State campus. While W.S.U. was putting students into this program, K.U. had practically no students in it. The K.U. Aerospace Department had started a Doctor of Engineering program into which most of their students were funneled.

After a few years of this unilateral usage of the program the program was altered so that each school ran its own program and gave its own degrees.

Other changes that resulted when we became part of the State system included (a) the ability of the faculty to take sabbatical leaves, and (b) cancelling of the practice of permitting faculty family members to attend at half-tuition. This latter change was not a burden because the State tuition was roughly half of that which the municipal university had charged.

The privilege of sabbatical leaves is important, and is one of which, in my opinion, the engineering faculty do not sufficiently take advantage. During my years at the municipal university, I spent most of my summers employed at the local aircraft plants--Cessna, Beech, and Boeing. That experience, combined with my military aircraft experience, enabled me to speak with knowledge and authority and to make my lectures more interesting.

Sabbatical leaves were granted at full-pay for a semester or at half-pay for a year. Also, in the seventies and eighties, the National Science Foundation sponsored summer employment at government

laboratories. I was able to spend four summers plus an academic year at NASA Langley Research Center in Virginia, an academic year at von Karman Institute for Fluid Dynamics in Belgium, and two summers at NASA Lewis Research Center. In addition to staying abreast of the aerodynamic research field, I brought back to W.S.U. sponsored research projects.

In addition to pushing the Ph.D. program, Dean Jakowatz increased our involvement in two-year Associate Degree programs. There was a fairly long history of two-year (and shorter) programs at the University, including secretarial, electronics technology, tool design, and fire fighting. These were scattered throughout the University with essentially no coordination. In 1976, a technical institute was established within the College of Engineering offering two-year programs leading to Associate of Science degrees in Mechanical Engineering Technology, Electrical Engineering Technology and Fire Science Technology. The program was headed by Gerald Rath.

At the same time, there was an erosion of the Engineering Core Curriculum. The Core requirements were minimized, under pressure from the separate departments, until there was essentially no real engineering core. Many of us who had worked to establish an engineering core based on the principle that each engineer should be an engineer first and a specialist second felt, if not betrayed, at least let down.

Some of us got involved in an interesting research program through politics. In the mid-seventies, Governor Robert Docking was considering running for the U.S. Senate. At this time, there was considerable interest in the problems of energy sources and concern about the control of crude oil by OPEC. One of Governor Docking's principal advisors was Marvin (Mike) Harder who had been a W.S.U. Political Science Professor and was at this time in Topeka in the Governor's Office. They decided that it would be good politics to show the Governor's concern about energy sources by funding energy research projects at each of the three State universities. Mike called me to ask if we would be interested in investigating generating electric power using windmills.

I jumped at the chance; it seemed that utilizing our aerodynamic know-how to harvest the energy of the well-known Kansas wind was perfect. Colon Dunn and I put together a research proposal for Mike Harder. It was included in the governor's budget and was funded by the Legislature.

This activity was a great opportunity for us, but it did not benefit the governor. Shortly before he was going to announce his candidacy, his brother was accused of some impropriety involving the State Architect's Office. The Governor retired, at the end of his term, to Arkansas City. I thought that the funding (\$100,000) was a one-time event, but Mike had put it in the W.S.U. budget as a line item, so that it was funded every year.

We set up a Wind Energy Center and worked with the Kansas Energy Office. I designed a two-bladed wind turbine and a tower which were built by the W.S.U. shop. Colon Dunn developed an induction generator system which showed quite a bit of promise. We erected the system on campus and did some testing. Gary Thomann, Mark Jong, and Bob Egbert of the E.E. department were all involved. This particular test item was doomed by the untimely death of Colon Dunn. I was unable to find anyone who fully understood what he was attempting to do with his induction generating system. We did use the wind turbine (the more proper name for the windmill) for studies of the Himmelscamp flow on the blades, and I also designed and built a wind turbine grain bin dryer which was installed at the grain laboratory at Kansas State University.

After Professor Dunn's death, I recommended that Gary Thomann be named director of the lab, and Dean Jakowatz made the appointment.

About this time, we received new support for wind energy research. Bill Wentz had done some excellent research in developing ailerons, flaps, and spoilers for modern airfoils. At first it was developing spoiler controls for the ATLIT (Advanced Technology Light Twin) airplane and then developing and testing in our wind tunnel, flaps for the new laminar flow airfoils being developed by NASA. This work was funded by NASA Langley Research Center.

The U.S. government aerodynamic development of wind turbines was being done for the Department of Energy by the Wind Energy Office of NASA at the Lewis Laboratory in Cleveland. The people there came to realize that one of the main problems was that of control of the output and speed of the turbines. It was suggested that perhaps spoilers or flaps could be used to control the turbines. They contacted the aerodynamics group at Langley Lab and were told that the person who knew most about the application of spoilers and flaps was Dr. Bill Wentz at Wichita State University.

Thus began a long series of research contracts with the NASA Wind Energy Office. We developed aileron controls for a 100-ft. wind turbine which was tested at the NASA test facility at Plum Brook, Ohio; we converted the NASA PROP computer program to user-friendly WIND code (WIND-2 through WIND-15); we also wind tunnel-tested tower components. I spent two summers at the Lewis Lab, and Bill and I made numerous presentations of the research results, including a one-week course at von Karman Institute in Belgium and a three-week short course in New Zealand.

NASA has now been out of the wind energy business for almost ten years. The work is being done by the National Renewable Energy Laboratory in Colorado. Bill Wentz and Scott Miller continue to do testing for them and for some of the commercial companies on next generation wind turbines. This work is being done by the National Institute for Aviation Research (NIAR). The former Wind Energy Laboratory was renamed the Center for Energy Studies in the mid-eighties. Dr. Robert Egbert is the director; most of their studies are in the electrical engineering field.

A source of pride for the College of Engineering has been the work which faculty and students have done for handicapped persons. Members of the Electrical Engineering and Industrial Engineering faculties worked with Jack Jonas of the United Cerebral Palsy to provide severely handicapped students, workers and others with the ability to live alone, to communicate with others, and to be gainfully employed.

This assistance involved development of a myriad of devices, such as special work stations, tailored wheel chairs, large button telephones, typewriters and computers for paraplegics, and much more. Design of special machine controls enabled the formation of Center Industries which makes license plates, jet transport windows, and a host of other products. In 1974 Professors Roy Norris, Elmer Hoyer, John Leslie, Everett Johnson, and others formed the Rehabilitation Research Center.

In 1979, Dean Charles V. Jakowatz resigned and returned to teaching Electrical Engineering. In 1987, he retired due to increasingly poor health.



THE WILHELM ERA



The Wilhelm Era

In 1979, an engineering faculty committee conducted a search for a dean, and they recommended Dr. William J. Wilhelm. Dr. Wilhelm was head of the Civil Engineering Department of West Virginia University. He was a native of Mobile, Alabama, had received his B.S.M.E. Degree at Auburn University, and M.S. and Ph.D. Degrees in Civil Engineering from North Carolina State University.

One of Dean Wilhelm's first activities was to establish the Sam Bloomfield Distinguished Engineer Lecture Series. Each year, a distinguished practicing engineer spends a day on campus, meeting with students and faculty, and in the evening delivers a lecture in his area of expertise.

He also initiated the Dwane and Velma Lunt Wallace Outstanding Educator Awards. At the annual Engineering Banquet held in conjunction with Open House, awards are given for excellence in teaching, research, continuing education, and for outstanding teaching fellows. Also, the Wallace Scholarship Program was expanded.

In 1983, the Engineering Technology program was closed. Continuing the move toward a research university, the next year the Ph.D. program was extended to all four engineering departments.

I was at the NASA Langley Research Center for my sabbatical year of 1985-86. During that time the National Institute for Aviation Research (NIAR) was born. The Research Institute was the brainchild of Fred Sudermann and President Warren Armstrong. They convinced Senator Robert Dole that such an aviation research institute was needed, and that Wichita, Kansas, the Air Capital of the World, was the place for it. Senator Dole worked the financing into a Spring 1986 appropriation bill with \$5 million coming from the Army and \$3 million coming from the Federal Aviation Administration. The plan was to make laboratories and equipment available to the W.S.U. faculty and graduate students to work on problems in the aircraft industry. The faculty would be primarily engineers, but also it was hoped that participants would come from physics, chemistry, business, and computer science.

Initially, John Breazeale, a physicist, who had served as an outstanding Academic Vice President of the University, was the Director of the Institute. He got the planning and organization off to a good start and then retired, turning the job over to Bill Wentz. A splendid laboratory was built adjacent to the Beech Wind Tunnel. We moved into the new building in December 1989, and it was dedicated April 30, 1990. Dr. William Wentz was Executive Director, Dr. John Hutchinson was Director of the Center for Aviation Safety, Dr. Richard Graham was Director of the Center for Productivity Enhancement, Dr. Brent Bowen directed the Center for Aviation Research and Management, and I was the Director of the Center for Basic and Applied Research.

The \$7 million, 75,000 sq.ft. building houses offices, conference and seminar rooms, and laboratories, including:

- Impact Dynamics Lab with crash sled
- Composites Lab
- Human Factors Lab
- Computer-integrated Manufacturing Lab
- CAD/CAM Training Rooms
- Materials Lab with electron microscopes
- Propulsion Lab
- Flow Visualization Lab with 2' x 3' water tunnel
- Wind Tunnels (7 x 10, 3 x 4, supersonic)
- Structures Lab
- Cryogenics Lab

At first, the organization was called the Aviation Research Institute; it was finally decided to name it the National Institute for Aviation Research. Jack Craig felt we went a little far, and he sarcastically always calls it the Galactic Institute.

Originally, Bill Wentz reported directly to the University's Academic Vice President. The Beech 7 x 10 Wind Tunnel and Engineering Shop were under the direction of the Dean of Engineering. The other wind tunnels and the Structures Lab were controlled by the A.E. department chairman.

After ten years operation, the management and personnel have changed. Most of the faculty and graduate and undergraduate students are

now from Engineering (with the exception of Dr. James Ho, physicist, who operates the Cryogenic Lab). The wind tunnels and shop are merged into the NIAR, and Bill Wentz reports to Fred Sudermann, WSU Vice-President for Research. There is a close relationship between the Institute and the College of Engineering. Many of the engineering faculty are "Faculty Associates" of NIAR. The labs are available for graduate students and their advisers, and many of the students are partly supported by research contracts and grants. The University Research Contracts and Government Relations Office has moved into the NIAR building to the mutual benefit of both.

When I retired, the first time, in 1991, David Ellis took my place as Research Director. Immediately before retiring I managed to secure a grant from the National Science Foundation to refurbish and modernize the aerodynamic laboratory. This money was used to improve the 7 by 10 Walter Beech Wind Tunnel. A roof was built over the tunnel to protect it from the ravages of weather. The drive motor was removed, for the first time in about thirty years, and it was completely overhauled and reinstalled. The horribly corrosive liquid starting rheostat was replaced by a solid state system. Most important, a new state-of-the-art high-speed data acquisition and reduction computer system was installed.

I felt good leaving the tunnel in tip-top condition. The wind tunnel continues to be used for faculty and graduate research, but also for contract research and for model testing for the aircraft companies.

Financial Support of the NIAR is provided by state money from KTEC (Kansas Technology Enterprise Corporation); from research contracts with FAA, NREL, and others; fees for testing (wind tunnel and Impact Lab) for aircraft companies; and income from MAMTC (Mid-America Manufacturing Technical Center).

As we moved into the decade of the nineties, the problem of obsolescence of laboratory equipment was becoming critical. Dean Wilhelm developed two programs to meet this problem. First, he started the Dean's Circle, a group of alumni pledged to raise an endowment fund to supply laboratory equipment. Secondly, he joined with the K.U. & K State Engineering Deans in obtaining from the Board of Regents, the right to apply a surcharge to the tuition for engineering courses. This extra money goes into an equipment fund.

The Dean's Circle was founded in 1989. There have been three Chairmen of the Circle:

Dick Holloway	1989 - 1993
Larry Frutiger	1993 - 1995
Bob Umschied	1995 -

An additional activity of the Dean's Circle is to designate one or two Distinguished Engineer Service Awards each year. Plaques commemorating these awards are placed in a position of honor on the wall in Wallace Hall. Awards to date are:

Dwane Wallace	1992
Melvin Snyder	1992
Bruce Peterman	1993
Eugene Klein	1994
John Leslie	1995

One of the most recent changes is the expansion of the work done by the Rehabilitation Center and the development of the Institute for Rehabilitation Research and Service.

At the time of Sputnik and the beginnings of the U.S. space program, many of the Aeronautical Engineering departments throughout the country laid claim to this new area of engineering by changing their names. Such names as Aeronautical and Astronautical Engineering and Aerospace Engineering appeared in college catalogs. The professional society, Institute of the Aeronautical Sciences changed its name to the American Institute of Aeronautics and Astronautics.

Partly because the Wichita area industry was involved with production of airplanes, i.e., winged flight vehicles, and partly because we faculty members were aeronautical engineers, at W.S.U., we resisted the temptation to change our name and we remained the Department of Aeronautical Engineering--until 1992, that is. Bert Smith, the department chairman, was bothered by the fact that most other departments are titled Aerospace Engineering. Following the sage admonition to "...not be the first nor the last to adopt a new fad", Bert convinced a majority of the department faculty to vote to change the name to Aerospace Engineering. However, I still consider myself an Aeronautical engineer.

The I. E. department has changed its name to Industrial and Manufacturing Engineering department and is now offering a degree in Manufacturing Engineering. This is part of a national trend to increase design and manufacturing courses. The pendulum had swung too far from art of engineering to science of engineering.

In 1992, I retired a second time and was named Professor Emeritus of Aerospace Engineering and Director Emeritus of the Center for Basic and Applied Research of the National Institute for Aviation Research. I must admit that I am Proud of the title just as I was proud for so many years to be Professor of Aeronautical Engineering at Wichita State University.

Also, I get a permanent parking sticker for my car, free membership at the University Club, and free admission to the Heskett Center. And that is really pretty good. In addition, Glen Zumwalt and I have a tiny office in the NIAR Building. That's where I maintain the archives of the Midwest Section of the American Society for Engineering Education and of the Wichita Section of the American Institute for Aeronautics and Astronautics. I have consulted with Dr. Scott Miller on wind energy conversion research, and Bill Wentz and I jointly published a report on control of wind turbines.

The summer after my retirement, my wife Kay and I decided to take advantage of the University's policy of letting Senior Citizens audit courses. We decided to take tennis. We came to Registration at the designated time. Kay's registration went right through (she had taken a course a few years earlier). I was informed that I could not register because my name was not in the computer. Computers have little compassion; it disregarded the fact that I had earned a Master's degree at W.U. and had been on the faculty for forty-five and a half years. Finally, after conferring with Mike Tilford, the Graduate Dean, I was provisionally admitted to the Graduate School so that I could audit a freshman course in tennis.

Since then, I have taken courses almost every semester--courses that I was too busy to take before: history, geology, astronomy, and I am going to continue to occupy seats in the classrooms. The academic life is invigorating--on either side of the desk.



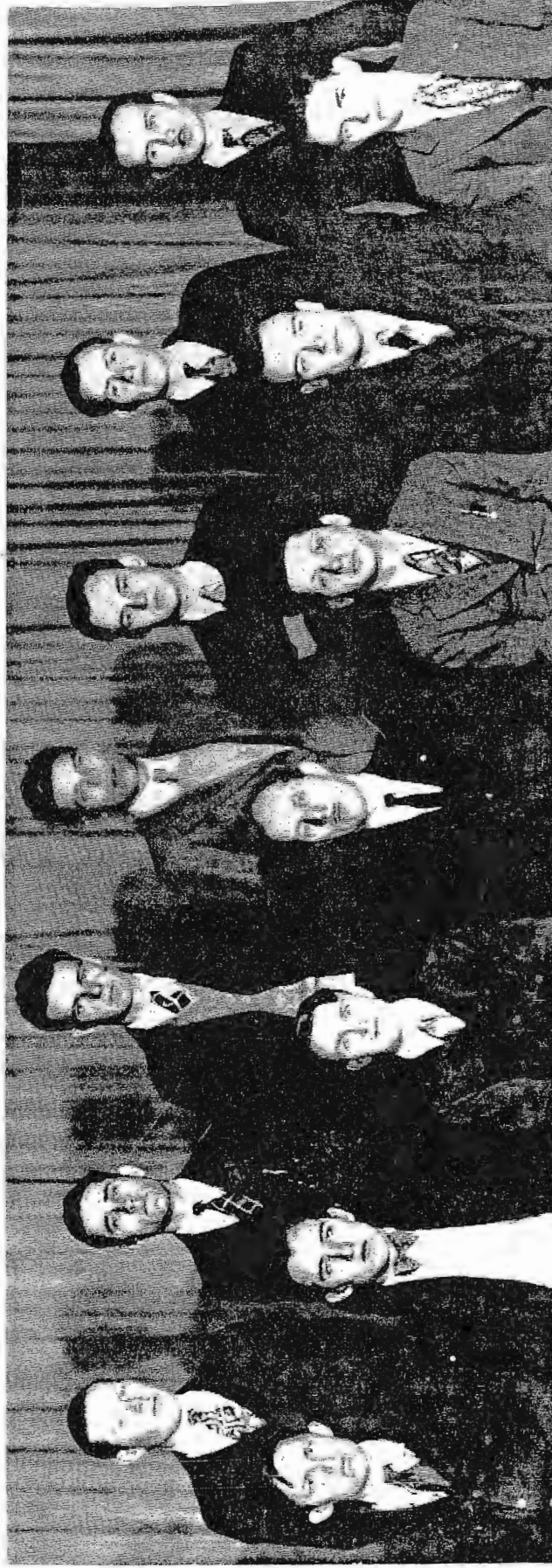
ROY W. ELLIOTT
Bursar and First
Engineering Professor



ALEXANDER PETROFF
Director of
Aeronautical Engineering



CHARLES M. MILLER
Asst. Professor of
Engineering



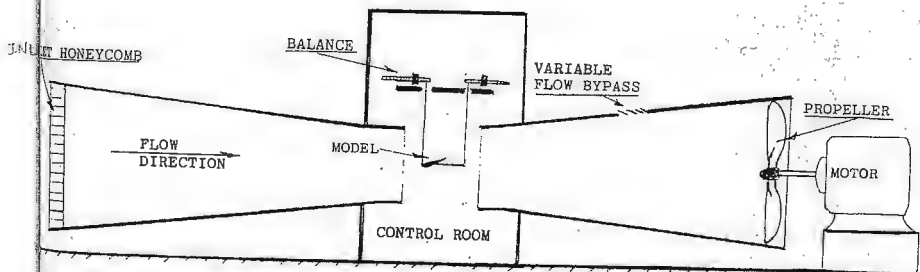
The Glider Club -- 1930

Standing: Leonard Zonker, Glenn Joram, Dwane Wallace
Carlos Shank, Tom Salter, William Leath, Byron Thayer

Seated: James Byrnes, Mike Bovankovitch, Virgil Adamson (secy.-treas)
Professor Alexander Petroff, George Baughman (president)
Jerry Gerteis (vice-pres), Emerson Brooks



Professor Petroff and Students, Oct. 27, 1932



Schematic of 4-ft. Wind Tunnel
Tunnel is in 4th floor of Science
Hall -- building in background of
picture above.



1931 -- Engineers Club in Front of Petroff 4-ft. Wind Tunnel



EAST
CAMPUS

1950

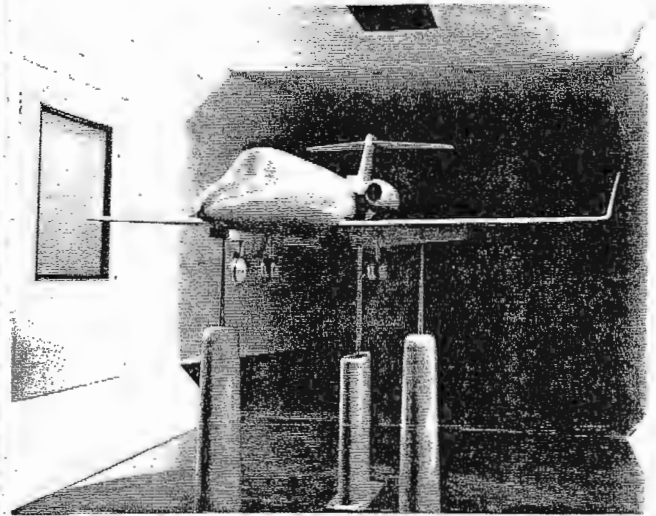


1970

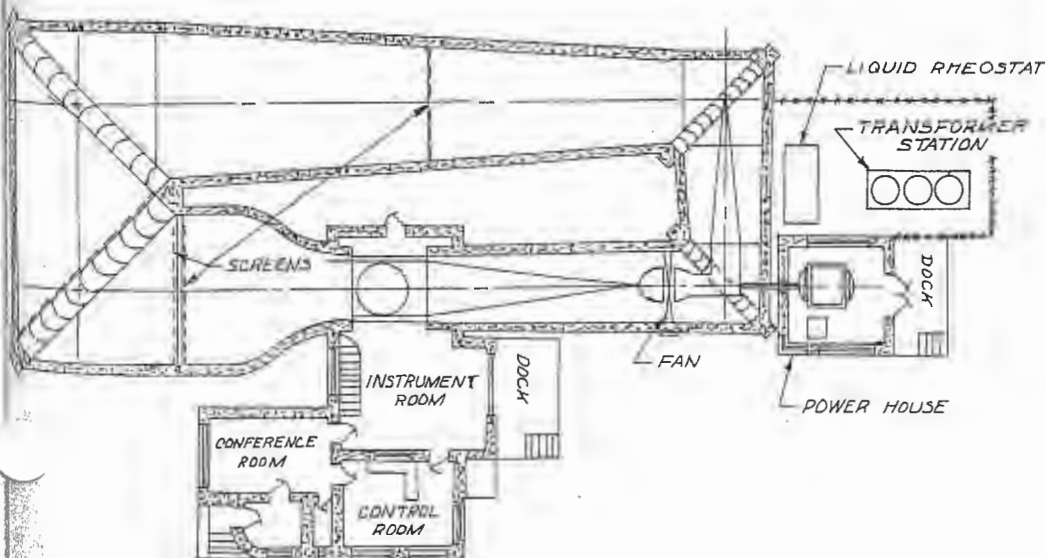


1985

WALTER BEECH MEMORIAL WIND TUNNEL

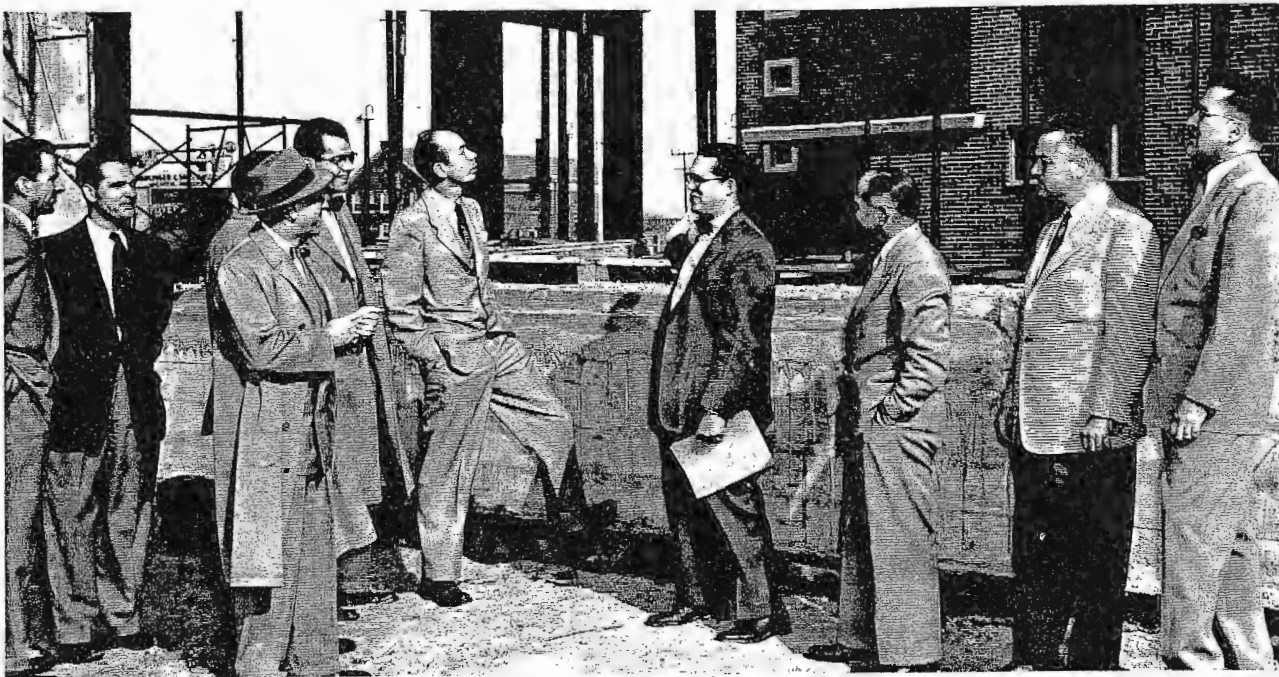


Dedication July 15, 1951. K. Razak speaking. Olive Ann Beech, Harry Corbin, and Dwane Wallace were among platform guests.

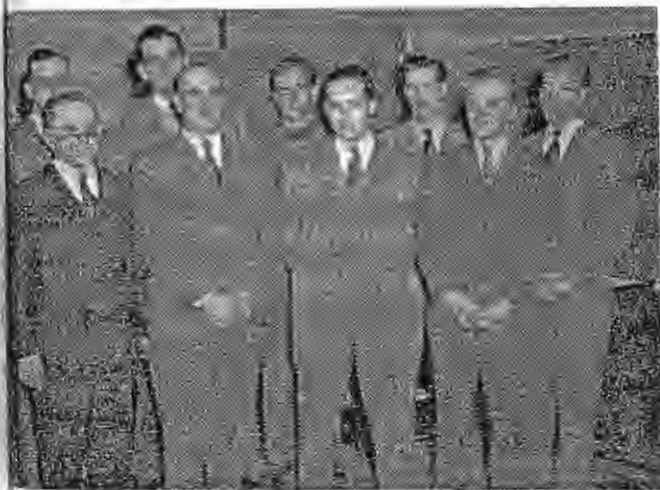


Charlie Newman & Forrest Olsen building a wing model for wind tunnel testing.

7' x 10' WIND TUNNEL



Engineering faculty checking out construction of the Engineering building. From left: Unknown, Bob Foster, hidden, Leonard Rastrelli, Mel Snyder, Art Risser, Ken Razak, Pat Brandenburg, Larry Hall, Jack Dunn; 1952.



Engineering Faculty

W Nagel, Charles Miller, Mel Snyder, John Gaddis,
Gottlieb, Ken Razak, Ron Byers, John Allen, Don Ward.



Above: Engineering Faculty at ASEE meeting at University of Nebraska.

Front: Jack Dunn, Bill Zook, Wayne Simons,
Pat Brandenburg

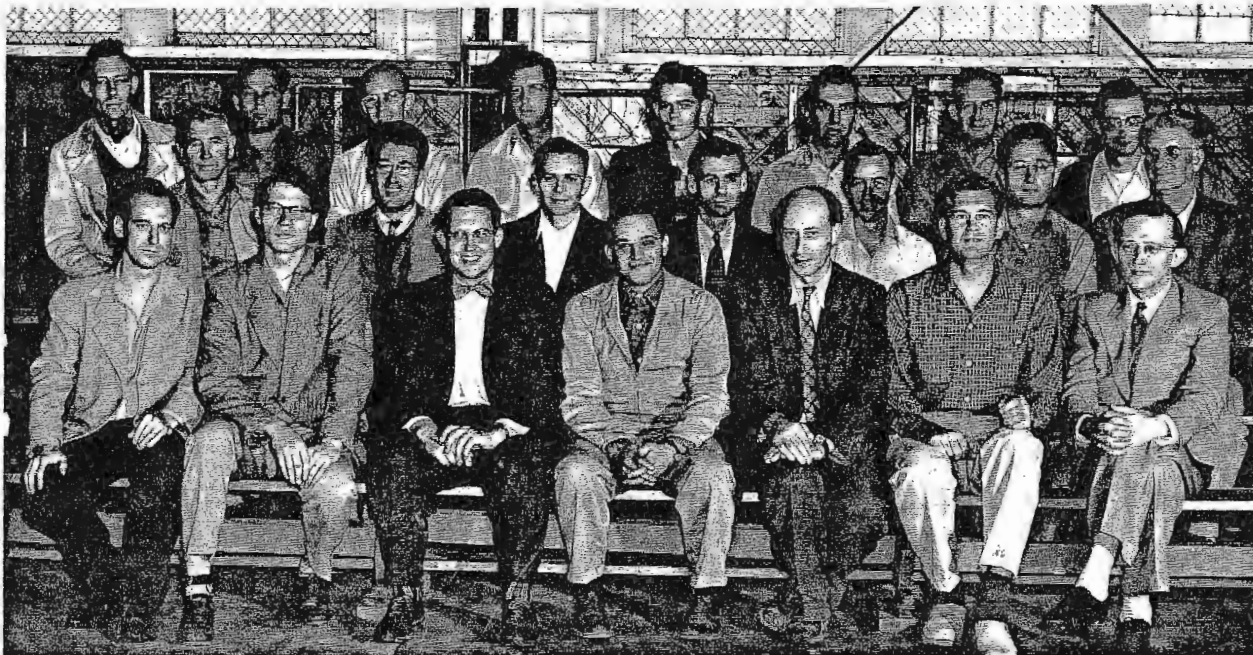
Rear: Leonard Rastrelli, Gene Chambers, Mel Snyder,
unidentified, Chet Johnson, Walt Bernhart



Left: Walt Bernhart demonstrating our first computer to faculty.

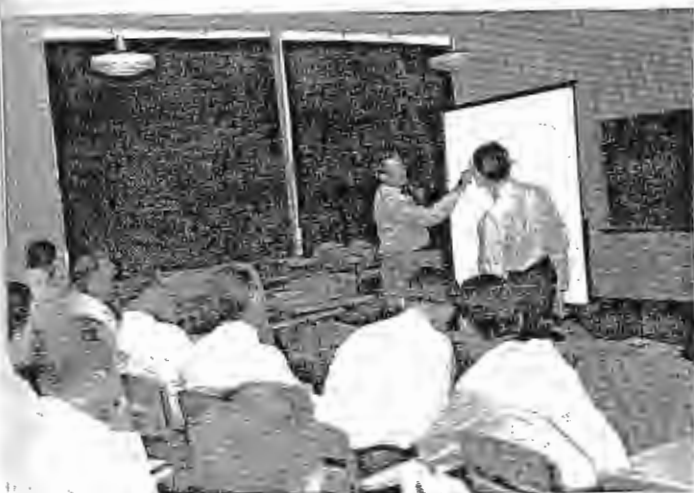
Seated: Loring Hanson, Walt Bernhart, Ed Williams

Standing: Bill Ford, Colon Dunn, Bob Howard, Bob Schrag,
Jim McDougal, Bob Reed,



ENGINEERING RESEARCH DEPARTMENT PERSONNEL, 1954

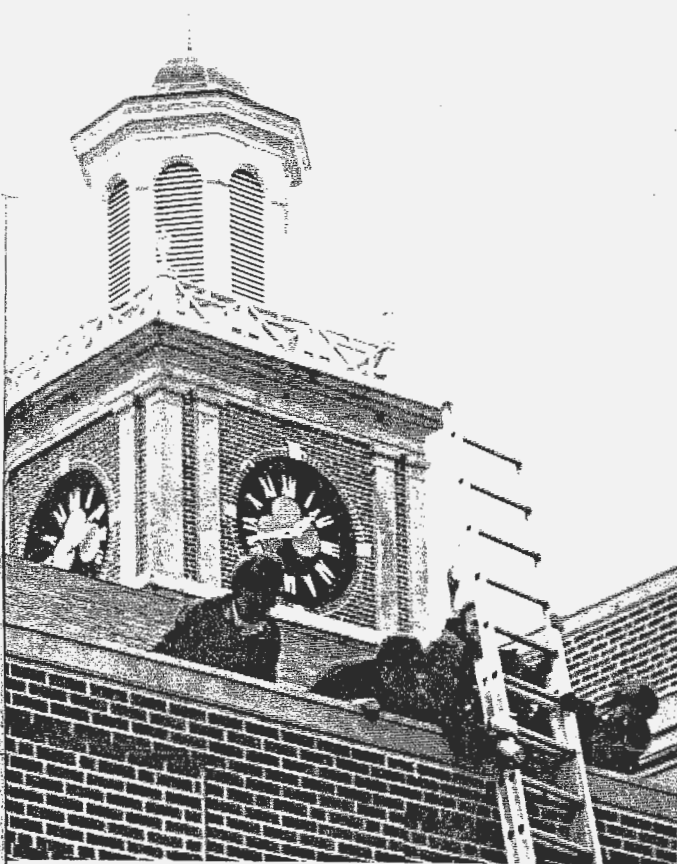
- 1st Row: Unidentified, Richard Wallace, Ken Razak, Virgil Razak, Frederick Wagner, "Big Mac", Heinrich Helmbold.
- 2nd Row: Mr. Newman, Otto Winterhalter, Vic Ten Eyck, Paul Morris, "Little Mac", Forrest Olsen, unidentified.
- 3rd Row: Rod Kelley, Paul Smith, Cornelius Jongedyk, unidentified, George Gerards, unidentified, Royal Bondie.



K. Razak leading discussion at the short course on Boundary Layer Control and Circulation Control.



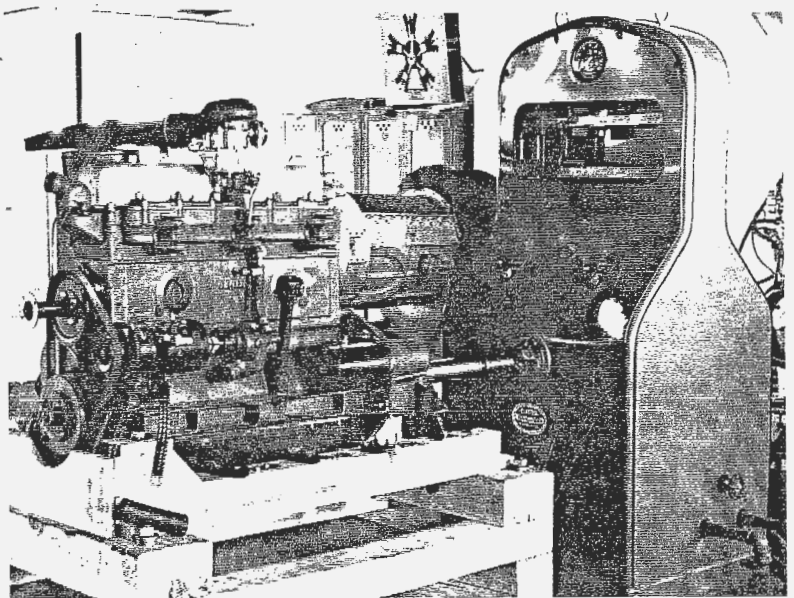
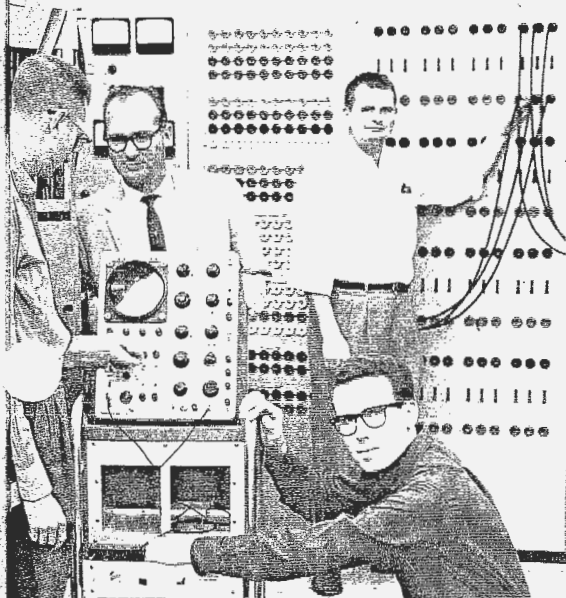
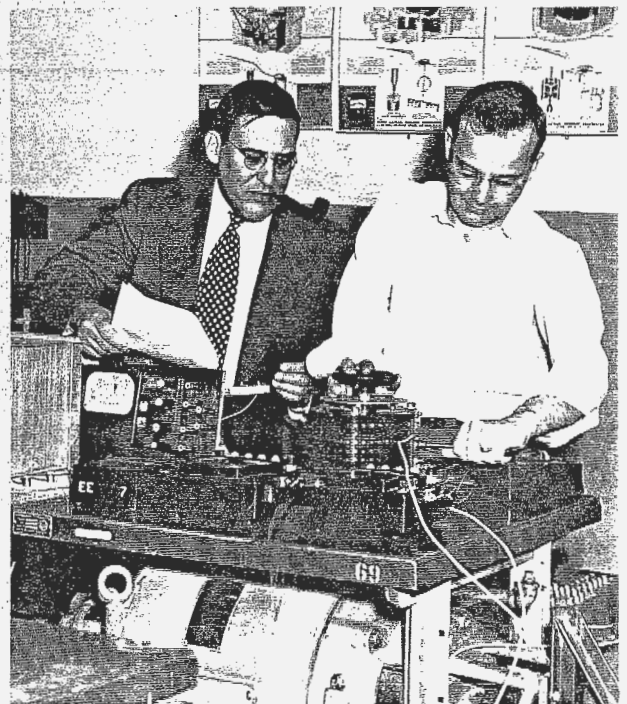
...ing to learn from the masters; Ph. Poisson-Quinton left, Alexander Lippisch at right.



Cancelling Classes for St. Pat's Day



THE ROCK and ENGINEERING COUNCIL





WALLACE HALL

DWANE and VELMA WALLACE



**NATIONAL INSTITUTE
for AVIATION RESEARCH**

First Director of NIAR was
Dr. John Breazeale (Below)

The present Director is
Dr. William Wentz, shown below
at left at the Water Tunnel.



APPENDIX

ENGINEERING DEANS

C. Kenneth Razak	1948-52	Director of School of Engineering
	1950-52	Acting Dean, College of Business Administration and Industry
	1952-65	Dean of School of Engineering
Charles V. Jakowatz	1965-78	Dean of College of Engineering
William J. Wilhelm	1979-pres.	Dean of College of Engineering

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|                       |         |                                       |
|-----------------------|---------|---------------------------------------|
| Lloyd M. Benningfield | 1972-86 | Dean of Graduate Studies and Research |
| Melvin H. Snyder      | 1958-59 | Acting Dean of School of Engineering  |
| Colon Dunn            | 1964-65 | Acting Dean of School of Engineering  |



## DEPARTMENT HEADS / CHAIRMEN

### ENGINEERING

|         |                |      |
|---------|----------------|------|
| 1933-47 | Roy W. Elliott | Head |
|---------|----------------|------|

### AERONAUTICAL / AEROSPACE ENGINEERING

|            |                      |                 |
|------------|----------------------|-----------------|
| 1928-33    | Alexander N. Petroff | Director        |
| 1945-50    | C. Kenneth Razak     | Head            |
| 1951-58    | Melvin H. Snyder     | Head            |
| 1958-59    | Barnes W. McCormick  | Head            |
| 1959-60    | Joseph "Win" Dalley  | Head            |
| 1960-61    | Everett L. Cook      | Acting Head     |
| 1961-63    | Melvin H. Snyder     | Head            |
| 1963-67    | Andrew Jack Craig    | Chairman        |
| 1967-69    | Melvin H. Snyder     | Chairman        |
| 1969-70    | Glen W. Zumwalt      | Acting Chairman |
| 1970-75    | Edward J. Rodgers    | Chairman        |
| 1975-78    | Melvin H. Snyder     | Chairman        |
| 1978-81    | Edward J. Rodgers    | Chairman        |
| 1981-94    | Bert L. Smith        | Chairman        |
| 1994-pres. | Ramesh Agarwal       | Chairman        |

### INDUSTRIAL ENGINEERING / INDUSTRIAL & MANUFACTURING ENGINEERING

|                |                         |              |
|----------------|-------------------------|--------------|
| 1949 - 1954    | H. Lawrence Hall        | Head         |
| 1954 - 1961    | William W. Zook         | Head         |
| 1962 - 1963    | Earle Butler            | Acting Head  |
| 1963 - 1964    | George L. Dickey        | Head         |
| 1964 - 1974    | John H. Leslie          | Head         |
| 1974 - 1977    | Allen Schuermann        | Chairman     |
| 1977 - 1979    | Robert D. Dryden        | Chairman     |
| 1979 - 1984    | Allen Schuermann        | Chairman     |
| 1984 - 1985    | Yildirim "Bill" Omurtag | Chairman     |
| 1985           | Richard Graham          | Acting Chmn. |
| 1986           | Don E. Malzahn          | Acting Chmn. |
| 1987 - 1989    | Brian Lambert           | Chairman     |
| 1989 - 1993    | Donald L. Hommertzheim  | Chairman     |
| 1994 - present | Abu S. Masud            | Chairman     |

### ENGINEERING DRAWING / ENGINEERING GRAPHICS

|             |                  |             |
|-------------|------------------|-------------|
| 1950 - 1951 | Roland O. Byers  | Acting Head |
| 1955 - 1960 | Arthur C. Risser | Acting Head |
| 1955 - 1972 | Arthur C. Risser | Head        |

### ENGINEERING SHOPS & INDUSTRIAL ARTS

|             |               |             |
|-------------|---------------|-------------|
| 1950 - 1951 | William Nagel | Acting Head |
|-------------|---------------|-------------|

### CIVIL ENGINEERING

|             |                      |      |
|-------------|----------------------|------|
| 1950 - 1957 | Leonard U. Rastrelli | Head |
|-------------|----------------------|------|

### ENGINEERING RESEARCH

|             |                        |      |
|-------------|------------------------|------|
|             | Virgil Razak           | Head |
| 1957 - 1960 | Robert K. Wattson, Jr. | Head |

### MECHANICAL ENGINEERING

|                |                      |          |
|----------------|----------------------|----------|
| 1950 - 1959    | John W. Dunn         | Head     |
| 1959 - 1964    | Gordon B. McKay      | Head     |
| 1964 - 1964    | David O. Stuart      | Head     |
| 1965 - 1966    | Norman R. Byers      | Head     |
| 1967 - 1971    | Albert L. Gosman     | Head     |
| 1971 - 1978    | Raymond V. Smith     | Chairman |
| 1978 - 1984    | A. Richard Graham    | Chairman |
| 1984 - 1988    | James M. Bowyer, Jr. | Chairman |
| 1988 - 1989    | Albert L. Gosman     | Chairman |
| 1989 - present | Richard T. Johnson   | Chairman |

### ENGINEERING SCIENCE/APPLIED MECHANICS/MECHANICS AND MATERIALS

|             |                    |          |
|-------------|--------------------|----------|
| 1956 - 1965 | Loring O. Hanson   | Chairman |
| 1965 - 1968 | Walter D. Bernhart | Chairman |

ELECTRICAL ENGINEERING

|                |                    |                 |
|----------------|--------------------|-----------------|
| 1956 - 1957    | Howard Hamilton    | Acting Head     |
| 1957 - 1958    | Howard Hamilton    | Head            |
| 1958 - 1961    | Arthur T. Murphy   | Head            |
| 1961 - 1969    | Colon Dunn         | Head            |
| 1970 - 1972    | Lloyd Benningfield | Chairman        |
| 1972 - 1983    | William R. Ford    | Chairman        |
| 1983 - 1995    | Roy H. Norris      | Chairman        |
| 1992 - 1992    | Mark Jong          | Acting Chairman |
| 1995 - present | Everett L. Johnson | Chairman        |

ENGINEERING TECHNOLOGY

|             |             |          |
|-------------|-------------|----------|
| 1976 - 1984 | Gerald Rath | Director |
|-------------|-------------|----------|

# ENGINEERING FACULTY

NOTE: This list contains the names of Instructors, Assistant Professors, Associate Professors, Professors, and Distinguished Professors. It does not include Lecturers or Adjuncts..

| Dates          | Name                   | Department                         |                          |  |  |
|----------------|------------------------|------------------------------------|--------------------------|--|--|
| 1926 - 1947    | Roy W. Elliott         | Engr.                              | also Bursar, Comptroller |  |  |
| 1928 - 1933    | Alexander N. Petroff   | A. E.                              |                          |  |  |
| 1932 - 1950    | Charles M. Miller      | Engr.                              |                          |  |  |
| 1943 - 1964    | C. Kenneth Razak       | A. E., Dean                        |                          |  |  |
| 1943 - 1949    | John Gaddis            | Engr.                              | also Bldg & Grnd. Dir.   |  |  |
| 1946 - 1949    | John S. Allen          | Machine Shop Practice              |                          |  |  |
| 1946 - 1951    | Roland O. Byers        | Engr. Drawing                      |                          |  |  |
| 1946 - 1949(?) | Robert Gottlieb        | A. E.                              |                          |  |  |
| 1946 - 1951    | William Nagel          | Engr. Draw.; Engr Shop & Ind. Arts |                          |  |  |
| 1947 - 1992    | Melvin H. Snyder       | A. E.                              |                          |  |  |
| 1948 - 1959    | John W. Dunn           | A. E.; M. E.                       |                          |  |  |
| 1949 - 1954    | H. Lawrence Hall       | I. E.                              |                          |  |  |
| 1950 - 1951    | Jack W. Fisher         | A. E.                              |                          |  |  |
| 1950 - 1957    | Leonard U. Rastrelli   | C. E.                              |                          |  |  |
| 1951 - 1954    | Robert G. Foster       | A. E.; Engr. Res.; Engr. Draw.     |                          |  |  |
| 1952 - 1956    | Patrick Brandenburg    | M. E.                              |                          |  |  |
| 1953 - 1967    | Everett L. Cook        | A. E.                              |                          |  |  |
| 1969 - 1980    | " " "                  | A. E.                              |                          |  |  |
| 1953 - 1964    | Howard Hamilton        | E. E.                              |                          |  |  |
| 1953 - 1957    | Chester M. Johnson     | I. E.                              |                          |  |  |
| 1954 - 1962    | Walter D. Bernhart     | C. E.; Appl. Mechanics             |                          |  |  |
| 1965 - 1994    | " " "                  | E. E.; Mech. & Mtls.; A. E.        |                          |  |  |
| 1954 - 1957    | John Ruptash           | A. E.                              |                          |  |  |
| 1954 - 1960    | Warren A. Simons       | Engr. Draw.                        |                          |  |  |
| 1954 - 1961    | William W. Zook        | I. E.                              |                          |  |  |
| 1955 - 1971    | Loring O. Hanson       | M. E.; Mech & Mtls.; A. E.         |                          |  |  |
| 1955 - 1972    | Charles B. Pfeffer     | Engr. Draw.                        |                          |  |  |
| 1955 - 1972    | Arthur C. Risser       | Engr. Draw ; Graphics; I. E.       |                          |  |  |
| 1956 - 1969    | Benjamin M. Aldrich    | M. E.                              |                          |  |  |
| 1956 - 1963    | Earle H. Butler        | I. E.                              |                          |  |  |
| 1956 - 1966    | Albert Gene Chambers   | Engr. Draw., Graphics; M. E.       |                          |  |  |
| 1956 - 1959    | Andrew Jack Craig      | Engr. Res.; A. E.                  |                          |  |  |
| 1960 - 1961    | " " "                  | A. E.                              |                          |  |  |
| 1963 - 1992    | " " "                  | A. E.                              |                          |  |  |
| 1956 - 1961    | Arthur T. Murphy       | E. E.                              |                          |  |  |
| 1956 - 1959    | Arnold R. Graef        | Engr. Draw.                        |                          |  |  |
| 1956 - 1959    | Homer L. Puderbaugh    | Engr. Draw.                        |                          |  |  |
| 1956 - 1960    | Robert K. Wattson      | A. E.; Engr. Res.                  |                          |  |  |
| 1957 - 1958    | Levi Arehart           | M. E.                              |                          |  |  |
| 1957 - 1960    | Howard E. Degler       | M. E.                              |                          |  |  |
| 1957 - 1958    | Lowell K. Dirksen      | C. E.                              |                          |  |  |
| 1957 - 1977    | Forrest D. Haines      | Engr. Draw.; I. E.                 |                          |  |  |
| 1957 - 1995    | Robert L. Schrag       | E. E.                              |                          |  |  |
| 1957 - 19      | Clyde A. Shockley, Jr. | Appl. Mech.                        |                          |  |  |
| 1957 - 1960    | William E. Simpkin     | A. E.                              |                          |  |  |
| 1957 - 1958    | William H. Wentz, Jr.  | M. E.                              |                          |  |  |
| 1953 - present | " " "                  | A. E.                              |                          |  |  |
| 1958 - 1961    | Martin D. Bradshaw     | E. E.                              |                          |  |  |
| 1958 - 1960    | Ronald C. Hill         | M. E.                              |                          |  |  |
| 1958 - 1959    | Barnes W. McCormick    | A. E.                              |                          |  |  |
| 1958 - 1961    | Robert R. Reed         | Appl. Mech.                        |                          |  |  |
| 1964 - 19      | " " "                  | " "                                |                          |  |  |
| 1959 - 1960    | Joseph W. Dalley       | A. E.                              |                          |  |  |
| 1959 - 1975    | Colon Dunn             | E. E.                              |                          |  |  |
| 1959 - 1961    | Hsung-Cheng Hsieh      | E. E.                              |                          |  |  |
| 1959 - 1964    | Gordon B. McKay        | M. E.                              |                          |  |  |
| 1959 - 1959    | Giuseppe Oppo          | E. E.                              |                          |  |  |
| 1959 - 1961    | Zvi Prihar             | E. E.                              |                          |  |  |
| 1959 - 1960    | Ahmed Ullah            | E. E.                              |                          |  |  |
| 1959 - 1961    | George W. Zobrist      | E. E.                              |                          |  |  |
| 1960 - 1961    | George Campbell        | Appl. Mech.                        |                          |  |  |
| 1960 - 1964    | Robert T. Howard       | Appl. Mech.                        |                          |  |  |
| 1960 - 1963    | Herbert Netsch         | M. E.                              |                          |  |  |
| 1960 - 1961    | Tipton Nick Patton     | E. E.                              |                          |  |  |
| 1960 - 1980    | John B. Sevart         | M. E.                              |                          |  |  |
| 1960 - 1965    | David O. Stuart        | M. E.                              |                          |  |  |
| 1961 - 1963    | Claude Foltz           | A. E.                              |                          |  |  |
| 1961 - 1984    | William R. Ford        | E. E.                              |                          |  |  |
| 1961 - 1963    | James R. McDougal      | E. E.                              |                          |  |  |
| 1961 - 1963    | Harold D. Nelson       | Appl. Mech., Mech. & Mtls.         |                          |  |  |
| 1965 - 1967    | " " "                  | Mech. & Mtls.                      |                          |  |  |
| 1961 - 1995    | Roy H. Norris          | E. E.                              |                          |  |  |
| 1961 - 1962    | Edward E. Williams     | E. E.                              |                          |  |  |

also NIAR Exec. Dir.

|                |                       |                                     |                |                          |                            |
|----------------|-----------------------|-------------------------------------|----------------|--------------------------|----------------------------|
| 1962 - 1964    | James D. Collier      | A. E.                               | 1969 - 1970    | Dikshitulu Kalluri       | E. E.                      |
| 1962 - 1974    | John H. Leslie, Jr.   | I. E.                               | 1969 - 1992    | Glen W. Zumwalt          | A. E.                      |
| 1962 - 1964    | Er-Chieh Ma           | Mech. & Mtls.                       | 1970 - 1976    | David H. Cowling         | E. E.                      |
| 1962 - 1964    | Gary L. Thompson      | Mech. & Mtls.                       | 1970 - 1971    | Ersin Eti                | A. E.                      |
| 1963 - 1964    | Gerald Bergmann       | A. E.                               | 1970 - 1988    | Edward J. Rodgers        | A. E.                      |
| 1963 - 1981    | John Robert Dolg      | Mech. & Mtls.; A. E.                | 1971 - present | Everett L. Johnson       | E. E.                      |
| 1963 - 1969    | W. Miles FitzGerald   | M. E.                               | 1971 - 1973    | Andrew Klavins           | A. E.                      |
| 1963 - 1967    | Robert B. Springer    | E. E.                               | 1971 - 1974    | Robert D. Linsted        | M. E.                      |
| 1964 - 1966    | Armin Brandhorst      | Appl Mech; Phys. Plant Dir. '66-'94 | 1975 - 1980    | " "                      | M. E.                      |
| 1964 - 1966    | Ben H. Cantrell       | Mech. & Mtls.                       | 1971 - 1972    | James H. Richardson      | E. E.                      |
| 1963 - 1964    | George L. Dickey      | I. E.                               | 1971 - 1986    | Allen C. Schuermann, Jr. | I. E.                      |
| 1964 - 1975    | Walter Eversman       | A. E.                               | 1971 - 1983    | Raymond V. Smith         | M. E.                      |
| 1964 - 1967    | Donald T. Higdon      | A. E.                               | 1972 - 1979    | John A. Alic             | M. E.                      |
| 1965 - 1966    | Norman R. Byers       | M. E.                               | 1972 - 1973    | John T. Wu               | I. E.                      |
| 1965 - present | A. Richard Graham     | M. E., MAMTC                        | 1972 - 1976    | Yi-Yuan Yu               | A. E.                      |
| 1965 - 1987    | Charles V. Jakowatz   | E. E., Dean                         | 1973 - 1979    | Gordon W. Bosker         | I. E.                      |
| 1965 - 1970    | Richard Ross          | A. E.                               | 1973 - present | Don E. Malzahn           | I. E.                      |
| 1965 - 1966    | Kenneth L. Simpson    | E. E.                               | 1973 - 1979    | K. Sam Shanmugan         | E. E.                      |
| 1966 - present | Barbara Bowman        | Biology, Asst. Dean of Engr.        | 1974 - 1978    | Manohar Lal              | E. E.                      |
| 1966 - 1967    | Jose Daccerett        | E. E.                               | 1974 - 1978    | Aziz Roobazar            | I. E.                      |
| 1966 - present | Elmer A. Hoyer        | E. E.                               | 1975 - 1987    | Gary C. Thomann          | E. E.                      |
| 1966 - present | Bert L. Smith         | Mech. & Mtls., A. E.                | 1976 - 1986    | L. C. Cheng              | M. E.                      |
| 1967 - 1993    | Lloyd M. Benningfield | E. E., Graduate Dean                | 1976 - 1993    | Donald L. Hommertzheim   | I. E.                      |
| 1967 - 1968    | Thomas J. Clark       | E. E.                               | 1976 - 1984    | Gerald Rath              | Engr. Tech.                |
| 1967 - 1972    | Herbert H. Coin       | A. E.                               | 1976 - 1977    | George M. Tomko, Jr.     | Engr. Tech.                |
| 1967 - 1971    | Frederick T. Elder    | M. E.                               | 1977 - 1981    | Ralph M. Burns           | E. E.                      |
| 1967 - 1993    | Albert L. Gosman      | M. E., Assoc. Dean of Engr.         | 1977 - 1989    | Robert D. Dryden         | E. E., Rahab. Engr. Center |
| 1967 - 1972    | Robert S. Goudy       | A. E.                               | 1977 - 1980    | Leslie Reed              | Engr. Tech.                |
| 1967 - present | Mark Jong             | E. E., Assoc. Dean of Engr.         | 1977 - 1981    | John B. Van Saun         | Engr. Tech.                |
| 1967 - 1972    | David E. McFarland    | A. E., Dean of University College   | 1978 - present | Leonard L. Anderson, Jr. | I. E., Rehab. Engr. Center |
| 1967 - present | John O'Loughlin       | E. E., NIAR                         | 1979 - present | William J. Wilhelm       | Engr. Educ., Dean          |
| 1967 - 1970    | Leo R. Pucacco        | E. E.                               | 1979 - present | M. Edwin Sawan           | E. E.                      |
| 1967 - 1970    | Robert R. Pugh        | I. E.                               | 1980 - present | Robert I. Egbert         | E. E.                      |
| 1967 - 1969    | Francis D. Severt     | Mech. & Mtls., A. E.                | 1980 - 1980    | John F. Mahan            | I. E.                      |
| 1967 - 1968    | Fang Toh Sun          | A. E.                               | 1980 - present | Abu S. Masud             | I. E.                      |
| 1968 - 1972    | Robert J. Beshara     | M. E.                               | 1980 - 1987    | Lionel R. Whitmer        | M. E.                      |
| 1968 - 1984    | Milan K. Jovanovic    | M. E.                               | 1981 - 1989    | Zbigniew Czajkiewicz     | I. E.                      |
| 1969 - present | Maresh Greywall       | M. E.                               | 1981 - 1982    | Rajiv Kapur              | I. E.                      |
| 1969 - 1976    | H. Sajon Joyner       | M. E.                               |                |                          |                            |

|                |                         |                                 |                |                       |                       |
|----------------|-------------------------|---------------------------------|----------------|-----------------------|-----------------------|
| 1981 - 1983    | Marjorie Marquee        | Engr. Tech.                     | 1988 - 1989    | Hooshang Javan        | E.E.                  |
| 1982 - 1983    | John G. Batey           | E.E. Tech.                      | 1988 - 1994    | Ming C. Liu           | I.E.                  |
| 1982 - 1987    | Nasser S. Fard          | I.E.                            | 1988 - present | L. Scott Miller       | A.E.                  |
| 1982 - 1983    | Shiang-yu Lee           | A.E.                            | 1988 - 1991    | Mohammad Sarmadi      | E.E.                  |
| 1982 - 1987    | Thangavel Parmasivam    | A.E.                            | 1988 - 1989    | Sekhar Venkatraman    | I.E.                  |
| 1982 - 1985    | Mansour Rahimi          | I.E.                            | 1989 - 1990    | Said El-Noubi         | E.E.                  |
| 1982 - 1986    | Raj Sodhi               | M.E.                            | 1989 - 1990    | Marc E. Herniter      | E.E.                  |
| 1982 - 1984    | Robert F. Schultz       | Engr. Tech.                     | 1989 - present | Richard T. Johnson    | M.E.                  |
| 1982 - 1983    | Harsh V. Zadoo          | I.E.                            | 1989 - present | Hamid Lankarani       | M.E.                  |
| 1983 - 1983    | Raymond J. Conway       | Engr. Tech.                     | 1989 - present | Shiela O'Connor       | Engr. , Asst. to Dean |
| 1983 - 1988    | Robert Henderson        | E.E.                            | 1989 - 1989    | Eva J. Szillery       | E.E.                  |
| 1983 - 1986    | Mohammad A. Karim       | E.E.                            | 1989 - present | Paul K. York          | E.E.                  |
| 1983 - 1990    | Mohammad Naji           | M.E.                            | 1990 - present | In-Chan Choi          | I.E.                  |
| 1983 - 1986    | H. M. Neely             | Engr. Tech.                     | 1990 - present | Klaus Hoffman         | A.E.                  |
| 1983 - 1985    | Yogesh B. Parikh        | I.E.                            | 1990 - present | Julie Mathis          | M.E.                  |
| 1983 - 1984    | Thavath Veruttipong     | E.E.                            | 1990 - present | Saeld Motavalli       | I.E.                  |
| 1984 - 1988    | James M. Bowyer, Jr.    | M.E.                            | 1990 - present | Larry Paarman         | E.E.                  |
| 1984 - present | Jharna Chaudhuri        | M.E.                            | 1990 - 1992    | Thangavel Subramanian | I.E.                  |
| 1984 - 1989    | James A. Harris         | M.E.                            | 1991 - present | Nagaraj Arakere       | M.E.                  |
| 1984 - present | Walter J. Horn          | A.E.                            | 1991 - present | Roy Y. Myose          | A.E.                  |
| 1984 - 1987    | Abbas Masnavi           | E.E.                            | 1991 - present | T. S. Ravigururajan   | M.E.                  |
| 1984 - present | Gawad M. Nagati         | A.E.                            | 1991 - present | Kamran Rokhsaz        | A.E.                  |
| 1984 - 1985    | Chowdary Nuthalapati    | E.E.                            | 1991 - present | Steven Robert Skinner | E.E.                  |
| 1984 - 1985    | Yildirim "Bill" Omurtag | I.E.                            | 1991 - 1993    | P. Sriram             | A.E.                  |
| 1985 - 1987    | Cihan Dagli             | I.E.                            | 1991 - present | James E. Steck        | M.E.                  |
| 1985 - 1988    | Magdi Najm              | I.E.                            | 1993 - present | Sayed Cheraghi        | I.E.                  |
| 1985 - 1991    | Paul O. Steranka, Jr.   | M.E.                            | 1993 - present | David Koert           | M.E.                  |
| 1985 - present | George E. Talia         | M.E.                            | 1993 - present | Hyuck M. Kwon         | E.E.                  |
| 1986 - 1991    | D. Wayne Becker         | NIAR, & Indus. Arts,62-67,69-81 | 1993 - present | Venkat Rajan          | I.E.                  |
| 1986 - 1987    | Sidney D. Chou          | M.E.                            | 1994 - present | Ramesh Agarwal        | A.E.                  |
| 1986 - 1989    | Osama Ayada             | I.E.                            | 1994 - present | Sterling Lewallen     | I. & M. E.            |
| 1986 - present | Jeffrey E. Fernandez    | I.E.                            | 1994 - present | Ravindra Pendse       | E.E.                  |
| 1986 - present | Michael Papadakis       | A.E.                            | 1994 - present | John S. Tomblin       | A.E.                  |
| 1987 - present | Steven J. Hooper        | A.E.                            | 1994 - present | Janet Twombey         | I. & M. E.            |
| 1987 - present | Ward T. Jewell          | E.E.                            | 1995 - present | Carol Shlaes          | I. & M. E.            |
| 1987 - 1992    | Brian Lambert           | I.E.                            | 1995 - present | Bin Wei               | I. & M. E.            |
| 1987 - present | William R. Parkhurst    | E.E.                            |                |                       |                       |
| 1988 - present | Benham Bahr             | M.E.                            |                |                       |                       |
| 1988 - present | Randall M. Chambers     | I.E.                            |                |                       |                       |

## ENGINEERING FACULTY

NOTE: This list contains the names of Instructors, Assistant Professors, Associate Professors, Professors, and Distinguished Professors. It does not include Lecturers or Adjuncts..

| Dates          | Name                   | Department                         |                        |  |  |
|----------------|------------------------|------------------------------------|------------------------|--|--|
| 1926 - 1947    | Roy W. Elliott         | Engr.                              |                        |  |  |
| 1928 - 1933    | Alexander N. Petroff   | A. E.                              |                        |  |  |
| 1932 - 1950    | Charles M. Miller      | Engr.                              |                        |  |  |
| 1943 - 1964    | C. Kenneth Razak       | A. E., Dean                        |                        |  |  |
| 1943 - 1949    | John Gaddis            | Engr.                              | also Bldg & Grnd. Dir. |  |  |
| 1946 - 1949    | John S. Allen          | Machine Shop Practice              |                        |  |  |
| 1946 - 1951    | Roland O. Byers        | Engr. Drawing                      |                        |  |  |
| 1946 - 1949(?) | Robert Gottlieb        | A. E.                              |                        |  |  |
| 1946 - 1951    | William Nagel          | Engr. Draw.; Engr Shop & Ind. Arts |                        |  |  |
| 1947 - 1992    | Melvin H. Snyder       | A. E.                              |                        |  |  |
| 1948 - 1959    | John W. Dunn           | A. E.; M. E.                       |                        |  |  |
| 1949 - 1954    | H. Lawrence Hall       | I. E.                              |                        |  |  |
| 1950 - 1951    | Jack W. Fisher         | A. E.                              |                        |  |  |
| 1950 - 1957    | Leonard U. Rastrelli   | C. E.                              |                        |  |  |
| 1951 - 1954    | Robert G. Foster       | A. E.; Engr. Res.; Engr. Draw.     |                        |  |  |
| 1952 - 1956    | Patrick Brandenburg    | M. E.                              |                        |  |  |
| 1953 - 1967    | Everett L. Cook        | A. E.                              |                        |  |  |
| 1969 - 1980    | " " "                  | A. E.                              |                        |  |  |
| 1953 - 1964    | Howard Hamilton        | E. E.                              |                        |  |  |
| 1953 - 1957    | Chester M. Johnson     | I. E.                              |                        |  |  |
| 1954 - 1962    | Walter D. Bernhart     | C. E.; Appl. Mechanics             |                        |  |  |
| 1965 - 1994    | " " "                  | E. E.; Mech. & Mtls.; A. E.        |                        |  |  |
| 1954 - 1957    | John Ruptash           | A. E.                              |                        |  |  |
| 1954 - 1960    | Warren A. Simons       | Engr. Draw.                        |                        |  |  |
| 1954 - 1961    | William W. Zook        | I. E.                              |                        |  |  |
| 1955 - 1971    | Loring O. Hanson       | M. E.; Mech & Mtls.; A. E.         |                        |  |  |
| 1955 - 1972    | Charles B. Pfeffer     | Engr. Draw.                        |                        |  |  |
| 1955 - 1972    | Arthur C. Risser       | Engr. Draw; Graphics; I. E.        |                        |  |  |
| 1956 - 1969    | Benjamin M. Aldrich    | M. E.                              |                        |  |  |
| 1956 - 1963    | Earle H. Butler        | I. E.                              |                        |  |  |
| 1956 - 1966    | Albert Gene Chambers   | Engr. Draw., Graphics; M. E.       |                        |  |  |
| 1956 - 1959    | Andrew Jack Craig      | Engr. Res.; A. E.                  |                        |  |  |
| 1960 - 1961    | " " "                  | A. E.                              |                        |  |  |
| 1963 - 1992    | " " "                  | A. E.                              |                        |  |  |
| 1956 - 1961    | Arthur T. Murphy       | E. E.                              |                        |  |  |
| 1956 - 1959    | Arnold R. Graef        | Engr. Draw.                        |                        |  |  |
| 1956 - 1959    | Homer L. Puderbaugh    | Engr. Draw.                        |                        |  |  |
| 1956 - 1960    | Robert K. Wattson      | A. E.; Engr. Res.                  |                        |  |  |
| 1957 - 1958    | Levi Arehart           | M. E.                              |                        |  |  |
| 1957 - 1960    | Howard E. Degler       | M. E.                              |                        |  |  |
| 1957 - 1958    | Lowell K. Dirksen      | C. E.                              |                        |  |  |
| 1957 - 1977    | Forrest D. Haines      | Engr. Draw.; I. E.                 |                        |  |  |
| 1957 - 1995    | Robert L. Schrag       | E. E.                              |                        |  |  |
| 1957 - 19      | Clyde A. Shockley, Jr. | Appl. Mech.                        |                        |  |  |
| 1957 - 1960    | William E. Simpkin     | A. E.                              |                        |  |  |
| 1957 - 1958    | William H. Wentz, Jr.  | M. E.                              |                        |  |  |
| 1963 - present | " " "                  | A. E.                              |                        |  |  |
| 1958 - 1961    | Martin D. Bradshaw     | E. E.                              |                        |  |  |
| 1958 - 1960    | Ronald C. Hill         | M. E.                              |                        |  |  |
| 1958 - 1959    | Barnes W. McCormick    | A. E.                              |                        |  |  |
| 1958 - 1961    | Robert R. Reed         | Appl. Mech.                        |                        |  |  |
| 1964 - 19      | " " "                  | " "                                |                        |  |  |
| 1959 - 1960    | Joseph W. Dalley       | A. E.                              |                        |  |  |
| 1959 - 1975    | Colon Dunn             | E. E.                              |                        |  |  |
| 1959 - 1961    | Hsung-Cheng Hsieh      | E. E.                              |                        |  |  |
| 1959 - 1964    | Gordon B. McKay        | M. E.                              |                        |  |  |
| 1959 - 1959    | Giuseppe Oppo          | E. E.                              |                        |  |  |
| 1959 - 1961    | Zvi Prihar             | E. E.                              |                        |  |  |
| 1959 - 1960    | Ahmed Ullah            | E. E.                              |                        |  |  |
| 1959 - 1961    | George W. Zobrist      | E. E.                              |                        |  |  |
| 1960 - 1961    | George Campbell        | Appl. Mech.                        |                        |  |  |
| 1960 - 1964    | Robert T. Howard       | Appl. Mech.                        |                        |  |  |
| 1960 - 1963    | Herbert Netsch         | M. E.                              |                        |  |  |
| 1960 - 1961    | Tipton Nick Patton     | E. E.                              |                        |  |  |
| 1960 - 1980    | John B. Sevard         | M. E.                              |                        |  |  |
| 1960 - 1965    | David O. Stuart        | M. E.                              |                        |  |  |
| 1961 - 1963    | Claude Foltz           | A. E.                              |                        |  |  |
| 1961 - 1984    | William R. Ford        | E. E.                              |                        |  |  |
| 1961 - 1963    | James R. McDougal      | E. E.                              |                        |  |  |
| 1961 - 1963    | Harold D. Nelson       | Appl. Mech., Mech. & Mtls.         |                        |  |  |
| 1965 - 1967    | " " "                  | Mech. & Mtls.                      |                        |  |  |
| 1961 - 1995    | Roy H. Norris          | E. E.                              |                        |  |  |
| 1961 - 1962    | Edward E. Williams     | E. E.                              |                        |  |  |

also NIAR Exec. Dir.



|                |                       |                                     |                |                          |                            |
|----------------|-----------------------|-------------------------------------|----------------|--------------------------|----------------------------|
| 1962 - 1963    | James D. Collier      | A. E.                               | 1969 - 1970    | Dikshitulu Kalluri       | E. E.                      |
| 1962 - 1974    | John H. Leslie, Jr.   | I. E.                               | 1969 - 1992    | Glen W. Zumwalt          | A. E.                      |
| 1962 - 1964    | Er-Chieh Ma           | Mech. & Mtls.                       | 1970 - 1976    | David H. Cowling         | E. E.                      |
| 1962 - 1964    | Gary L. Thompson      | Mech. & Mtls.                       | 1970 - 1971    | Ersin Eti                | A. E.                      |
| 1963 - 1964    | Gerald Bergmann       | A. E.                               | 1970 - 1988    | Edward J. Rodgers        | A. E.                      |
| 1963 - 1981    | John Robert Dolg      | Mech. & Mtls.; A. E.                | 1971 - present | Everett L. Johnson       | E. E.                      |
| 1963 - 1969    | W. Miles FitzGerald   | M. E.                               | 1971 - 1973    | Andrew Klavins           | A. E.                      |
| 1963 - 1967    | Robert B. Springer    | E. E.                               | 1971 - 1974    | Robert D. Linsted        | M. E.                      |
| 1964 - 1966    | Armin Brandhorst      | Appl Mech; Phys. Plant Dir. '66-'94 | 1975 - 1980    | " "                      | M. E.                      |
| 1964 - 1966    | Ben H. Cantrell       | Mech. & Mtls.                       | 1971 - 1972    | James H. Richardson      | E. E.                      |
| 1963 - 1964    | George L. Dickey      | I. E.                               | 1971 - 1986    | Allen C. Schuermann, Jr. | I. E.                      |
| 1964 - 1975    | Walter Eversman       | A. E.                               | 1971 - 1983    | Raymond V. Smith         | M. E.                      |
| 1964 - 1967    | Donald T. Higdon      | A. E.                               | 1972 - 1979    | John A. Alic             | M. E.                      |
| 1965 - 1966    | Norman R. Byers       | M. E.                               | 1972 - 1973    | John T. Wu               | I. E.                      |
| 1965 - present | A. Richard Graham     | M. E., MAMTC                        | 1972 - 1976    | Yi-Yuan Yu               | A. E.                      |
| 1965 - 1987    | Charles V. Jakowatz   | E. E., Dean                         | 1973 - 1979    | Gordon W. Bosker         | I. E.                      |
| 1965 - 1970    | Richard Ross          | A. E.                               | 1973 - present | Don E. Malzahn           | I. E.                      |
| 1965 - 1966    | Kenneth L. Simpson    | E. E.                               | 1973 - 1979    | K. Sam Shanmugan         | E. E.                      |
| 1966 - present | Barbara Bowman        | Biology, Asst. Dean of Engr.        | 1974 - 1978    | Manohar Lal              | E. E.                      |
| 1966 - 1967    | Jose Daccerett        | E. E.                               | 1974 - 1978    | Aziz Roobazar            | I. E.                      |
| 1966 - present | Elmer A. Hoyer        | E. E.                               | 1975 - 1987    | Gary C. Thomann          | E. E.                      |
| 1966 - present | Bert L. Smith         | Mech. & Mtls., A. E.                | 1976 - 1986    | L. C. Cheng              | M. E.                      |
| 1967 - 1993    | Lloyd M. Benningfield | E. E., Graduate Dean                | 1976 - 1993    | Donald L. Hommertzheim   | I. E.                      |
| 1967 - 1968    | Thomas J. Clark       | E. E.                               | 1976 - 1984    | Gerald Rath              | Engr. Tech.                |
| 1967 - 1972    | Herbert H. Colin      | A. E.                               | 1976 - 1977    | George M. Tomko, Jr.     | Engr. Tech.                |
| 1967 - 1971    | Frederick T. Elder    | M. E.                               | 1977 - 1981    | Ralph M. Burns           | E. E.                      |
| 1967 - 1993    | Albert L. Gosman      | M. E., Assoc. Dean of Engr.         | 1977 - 1989    | Robert D. Dryden         | E. E., Rahab. Engr. Center |
| 1967 - 1972    | Robert S. Goudy       | A. E.                               | 1977 - 1980    | Leslie Reed              | Engr. Tech.                |
| 1967 - present | Mark Jong             | E. E., Assoc. Dean of Engr.         | 1977 - 1981    | John B. Van Saun         | Engr. Tech.                |
| 1967 - 1972    | David E. McFarland    | A. E., Dean of University College   | 1978 - present | Leonard L. Anderson, Jr. | I. E., Rehab. Engr. Center |
| 1967 - present | John O'Loughlin       | E. E., NIAR                         | 1979 - present | William J. Wilhelm       | Engr. Educ., Dean          |
| 1967 - 1970    | Leo R. Pucacco        | E. E.                               | 1979 - present | M. Edwin Sawan           | E. E.                      |
| 1967 - 1970    | Robert R. Pugh        | I. E.                               | 1980 - present | Robert I. Egbert         | E. E.                      |
| 1967 - 1969    | Francis D. Severt     | Mech. & Mtls., A. E.                | 1980 - 1980    | John F. Mahan            | I. E.                      |
| 1967 - 1968    | Fang Toh Sun          | A. E.                               | 1980 - present | Abu S. Masud             | I. E.                      |
| 1968 - 1972    | Robert J. Beshara     | M. E.                               | 1980 - 1987    | Lionel R. Whitmer        | M. E.                      |
| 1968 - 1984    | Milan K. Jovanovic    | M. E.                               | 1981 - 1989    | Zbigniew Czajkiewicz     | I. E.                      |
| 1969 - present | Mahesh Greywall       | M. E.                               | 1981 - 1982    | Rajiv Kapur              | I. E.                      |
| 1969 - 1976    | H. Sajon Joyner       | M. E.                               |                |                          |                            |

|                |                         |             |                |                       |                       |
|----------------|-------------------------|-------------|----------------|-----------------------|-----------------------|
| 1981- 1983     | Marjorie Marquee        | Engr. Tech. | 1988 - 1989    | Hooshang Javan        | E.E.                  |
| 1982 - 1983    | John G. Batey           | E.E. Tech.  | 1988 - 1994    | Ming C. Liu           | I. E.                 |
| 1982 - 1987    | Nasser S. Fard          | I. E.       | 1988 - present | L. Scott Miller       | A.E.                  |
| 1982 - 1983    | Shiang-yu Lee           | A.E.        | 1988 - 1991    | Mohammad Sarmadi      | E.E.                  |
| 1982 - 1987    | Thangavel Parmasivam    | A.E.        | 1988 - 1989    | Sekhar Venkatraman    | I. E.                 |
| 1982 - 1985    | Mansour Rahimi          | I. E.       | 1989 - 1990    | Said El-Noubi         | E.E.                  |
| 1982 - 1986    | Raj Sodhi               | M.E.        | 1989 - 1990    | Marc E. Herniter      | E.E.                  |
| 1982 - 1984    | Robert F. Schultz       | Engr. Tech. | 1989 - present | Richard T. Johnson    | M.E.                  |
| 1982 - 1983    | Harsh V. Zadoo          | I. E.       | 1989 - present | Hamid Lankarani       | M.E.                  |
| 1983 - 1983    | Raymond J. Conway       | Engr. Tech. | 1989 - present | Shiela O'Connor       | Engr. , Asst. to Dean |
| 1983 - 1988    | Robert Henderson        | E.E.        | 1989 - 1989    | Eva J. Szillery       | E.E.                  |
| 1983 - 1986    | Mohammad A. Karim       | E.E.        | 1989 - present | Paul K. York          | E.E.                  |
| 1983 - 1990    | Mohammad Naji           | M.E.        | 1990 - present | In-Chan Choi          | I. E.                 |
| 1983 - 1986    | H. M. Neely             | Engr. Tech. | 1990 - present | Klaus Hoffman         | A.E.                  |
| 1983 - 1985    | Yogesh B. Parikh        | I. E.       | 1990 - present | Julie Mathis          | M.E.                  |
| 1983 - 1984    | Thavath Veruttiipong    | E.E.        | 1990 - present | Saeld Motavalli       | I. E.                 |
| 1984 - 1988    | James M. Bowyer, Jr.    | M.E.        | 1990 - present | Larry Paarman         | E.E.                  |
| 1984 - present | Jharna Chaudhuri        | M.E.        | 1990 - 1992    | Thangavel Subramanian | I. E.                 |
| 1984 - 1989    | James A. Harris         | M.E.        | 1991 - present | Nagaraj Arakere       | M.E.                  |
| 1984 - present | Walter J. Horn          | A.E.        | 1991 - present | Roy Y. Myose          | A.E.                  |
| 1984 - 1987    | Abbas Masnavi           | E.E.        | 1991 - present | T. S. Ravigururajan   | M.E.                  |
| 1984 - present | Gawad M. Nagati         | A.E.        | 1991 - present | Kamran Rokhsaz        | A.E.                  |
| 1984 - 1985    | Chowdary Nuthalapati    | E.E.        | 1991 - present | Steven Robert Skinner | E.E.                  |
| 1984 - 1985    | Yildirim "Bill" Omurtag | I. E.       | 1991 - 1993    | P. Sriram             | A.E.                  |
| 1985 - 1987    | Cihan Dagli             | I. E.       | 1991 - present | James E. Steck        | M.E.                  |
| 1985 - 1988    | Magdi Najm              | I. E.       | 1993 - present | Sayed Cheraghi        | I. E.                 |
| 1985 - 1991    | Paul O. Steranka, Jr.   | M.E.        | 1993 - present | David Koert           | M.E.                  |
| 1985 - present | George E. Talia         | M.E.        | 1993 - present | Hyuck M. Kwon         | E.E.                  |
| 1986 - 1991    | D. Wayne Becker         | NIAR,       | 1993 - present | Venkat Rajan          | I. E.                 |
| 1986 - 1987    | Sidney D. Chou          | M.E.        | 1994 - present | Ramesh Agarwal        | A.E.                  |
| 1986 - 1989    | Osama Ayada             | I. E.       | 1994 - present | Sterling Lewallen     | I. & M. E.            |
| 1986 - present | Jeffrey E. Fernandez    | I. E.       | 1994 - present | Ravindra Pendse       | E.E.                  |
| 1986 - present | Michael Papadakis       | A.E.        | 1994 - present | John S. Tomblin       | A.E.                  |
| 1987 - present | Steven J. Hooper        | A.E.        | 1994 - present | Janet Twombey         | I. & M. E.            |
| 1987 - present | Ward T. Jewell          | E.E.        | 1995 - present | Carol Shlaes          | I. & M. E.            |
| 1987 - 1992    | Brian Lambert           | I. E.       | 1995 - present | Bin Wei               | I. & M. E.            |
| 1987 - present | William R. Parkhurst    | E.E.        |                |                       |                       |
| 1988 - present | Benham Bahr             | M.E.        |                |                       |                       |
| 1988 - present | Randall M. Chambers     | I. E.       |                |                       |                       |

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