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AFIT

AIR FORCE INSTITUTE OF TECHNOLOGY

1919-1984
65th ANNIVERSARY



GENE LEHMAN

AFIT

65th ANNIVERSARY

From humble beginnings with cavalry officers in high boots studying kite-like airplanes, to a full-fledged institute whose graduates have walked on the moon, the Air Force Institute of Technology has come a long way.

The history of AFIT parallels the history of aviation, and, indeed, the history of the Air Force itself. From Lt. Jimmy Doolittle to the astronauts, the list of AFIT graduates is an impressive one.

In November 1918, just a few weeks after the signing of the Armistice ending World War I, Col. Thurman H. Bane, Head of the Technical Section at McCook Field, Dayton, Ohio, wrote to the director of military aeronautics in Washington.

Colonel Bane requested the establishment of an Air Force School of Application at McCook Field. He wanted the school to provide proper technical training for the permanent officers of the Air Service.

McCook Field, located at the intersection of the Miami and Mad Rivers, just north of downtown Dayton, already had engineering and experimental activities in process, so it was the natural place to start the school.

Colonel Bane's request was approved and the school officially opened on November 10, 1919. Eight officers, including Lt. Edwin Aldrin, Sr., father of astronaut "Buzz" Aldrin, comprised the first graduating class in 1920.

Prior to that first graduation, the National Defense Act established the Air Service as a combatant arm of the Army, and the school was renamed the Air Service Engineering School.

The young school, despite being pri-

marily an engineering school, produced many of the test pilots of early aviation days. One was Lt. John A. Macready, a parachute pioneer who also set many altitude records.

Another famous member of Lieutenant Macready's class of 1923 was Lt. James H. Doolittle. Lieutenant Doolittle became the first pilot to fly coast to coast in a single day, flying from Florida to California in 21 hours and 19 minutes, including a refueling stop at Kelly Field, Texas.

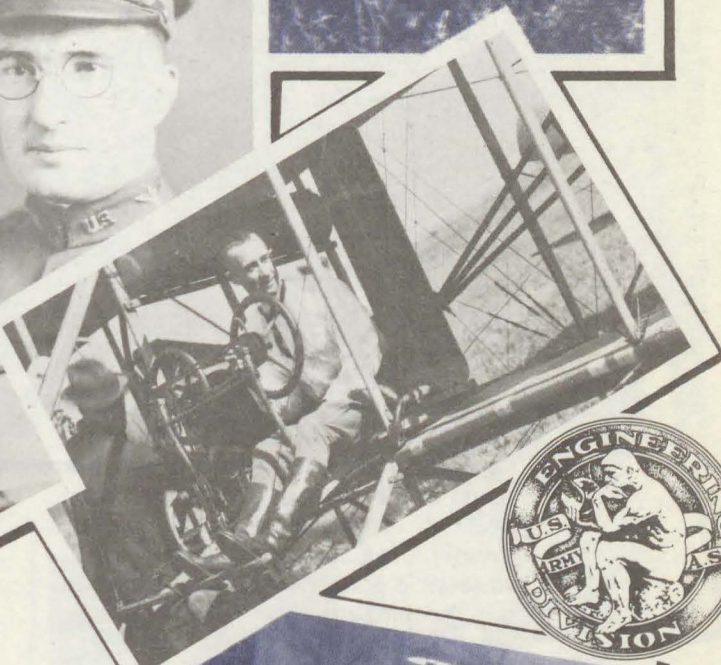
On To McCook Field

As aviation grew, so did the school, and it soon became obvious that the school and the Air Corps were outgrowing McCook Field. On October 12, 1927, new facilities were dedicated at Wright Field.

In the 1930's the curriculum was revised to appeal to a younger group of students, most of whom were either graduates of West Point or civilian technical institutions. There were four departments: fabrication, materials and structures, testing, and design.

Wright Field grew into a major engineering research center. The school grew as well, using laboratories on the field as well as trips to other locations to enhance its own facilities.

There is no doubt that the school did much to prepare the engineers of the Army Air Corps for their role in World War II. Unfortunately, as the graduates went to war after Pearl Harbor, regulations pertaining to the school were suspended pending further orders. The school was closed.



The school was re-established by Army Air Force Regulation on March 17, 1944, to meet the engineering requirements.

On April 1, 1944, 24 officers reported for class 44A as the school reopened as the Army Air Forces Engineering School. Beginning in 1945, plans were under way to convert the engineering school into a technology institute.

Classes begin again

Following approval, setup, and the arrival of a commandant — Brig. Gen. Mervin E. Gross ('33) — the Army Air Forces Institute of Technology opened on September 3, 1946, with almost 250 students enrolled.

The following year, after the Air Force became a separate service, the name was changed to the Air Force Institute of Technology (AFIT). The name of the Institute changed a few more times, but the AFIT name was eventually restored.

In 1956, AFIT conferred its first degrees. A total of 26 bachelor of science degrees were awarded in aeronautical, electrical, nuclear, and ordnance engineering on March 13, 1956.

Graduates in space program

When the Soviets launched Sputnik into space in 1957, America's need for engineers and scientists had become very apparent. Although AFIT did not educate officers specifically for the space program, many AFIT graduates went on to NASA. Three of the original seven astronauts were Air Force pilots and two of them — Capt. "Gordon" Cooper and Capt. "Gus" Grissom — were 1956 graduates of the Institute.

In the third group of astronauts, six of the 14 selected were AFIT graduates, including "Buzz" Aldrin (Edwin B. Jr.), son of the man who had organized the Air School of Application back in 1919.

The relationship between AFIT and NASA continued through the years. Perhaps space shuttle astronaut Lt. Col. "Guy" Bluford (Guion S.) represents the closest connection, since he earned both his master's and doctoral degrees in-residence at the Institute.

Three months after the establishment of a Space Command in October 1982, AFIT graduated its first class in space operations. This program prepared graduates for responsibilities in space operations, engineering, and logistics.

More Changes

In 1963, the School of Logistics, formerly known as the Logistics Education and Research Project (LERP), was renamed the School of Systems and Logistics, and the Civil Engineering Center, which was started in 1947 as the Installation Engineering School, was redesignated as the Civil Engineering School.

In 1964, a long-awaited engineering building was finished. In 1967, AFIT became a member of the Dayton-Miami Valley Consortium (renamed the Southwestern Ohio Council on Higher Education in 1984), an association of Dayton area colleges, universities, and businesses focused on promoting educational advancement.

The systems and logistics building was dedicated in October 1977. Later that year the strategic and tactical sciences program started in the School of Engineering.

In the early 80's, AFIT demonstrated growth in many areas including faculty development, faculty research, library expansion, and separate and larger data processing facilities for students, faculty, and staff. Strong programs in information processing, sensors, supportable electronic, laser technology, signal processing, radiation hardening, advanced composites, and space structures became part of the AFIT curriculum, putting AFIT in the forefront of high-technology education necessary for the Air Force to operate effectively in the 21st century.

Also during the early 80's, plans for a new science and research facility, which would house the academic library, AFIT's computer center, an auditorium, and other important facilities, were included in the Program Objectives Memorandum submitted to congress. Several other initiatives took shape during this period: a signal processing laboratory, a motion sickness research facility, an expended digital engineering laboratory, a laser holographic facility, a low observables laboratory, and an aggressive program for expansion of AFIT's computer capabilities.

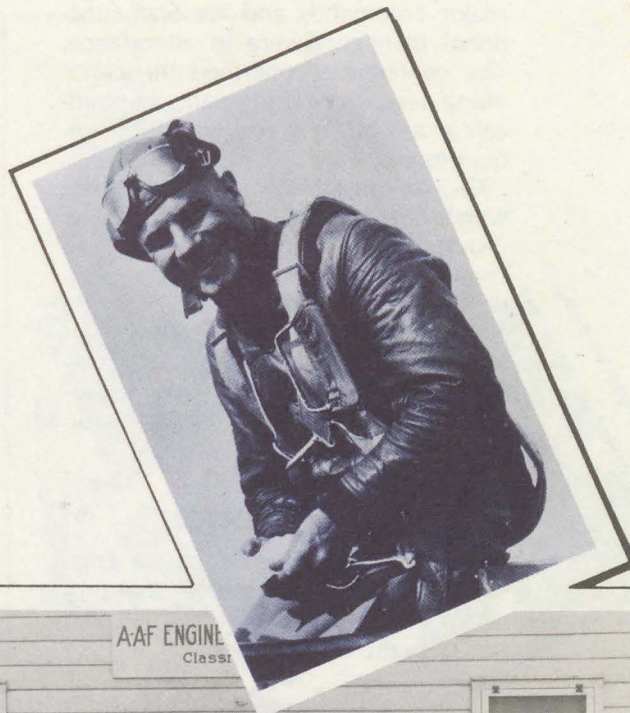
The Air Force Institute of Technology has a proud heritage, a history rich in accomplishments. Today, as in the past, AFIT's faculty, students, and staff are making significant progress in the constant pursuit of academic excellence. The Air Force Institute of Technology has indeed come a long way.

AFIT's mission

As it was in 1919, the Air Force Institute of Technology's mission is to develop, conduct and administer degree-granting, professional continuing education, and special programs in scientific and technical engineering, systems and logistics management, operations research, civil engineering, medicine and other disciplines.

AFIT's mission includes conducting basic and applied research and providing technical and managerial consulting services to various Air Force and Department of Defense agencies.

Programs are provided at Wright-Patterson Air Force Base, at other sites,



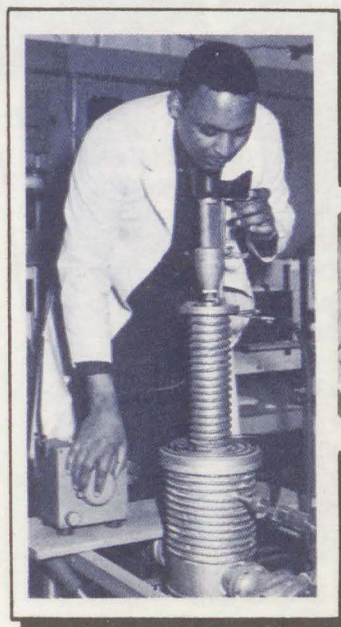
and through contracts with civilian educational and health care institutions, and various industrial organizations.

As a degree-granting institution, AFIT is accredited through the doctoral level by the North Central Association of Colleges and Schools.

Appropriate engineering curricula are also accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc.

Educational requirements

AFIT's resident degree and Professional Continuing Education (PCE) programs continue to grow steadily. In June 1984, an Air Force Education Requirements Conference was held at AFIT to outline the Air Force's education requirements for FY 86-90. Most



major commands and Air Staff functional managers were in attendance. The conference confirmed the continuing need for AFIT programs and indicated an increase in education requirements.

Civilian Institution (CI) Programs, which also continue to grow steadily, provide flexibility and rapid response to changing Air Force needs. There are presently over 5300 students studying at more than 350 civilian universities or medical schools and at 70 industrial firms, as well as at many Armed Services hospitals throughout the nation and abroad.

School of Engineering

The mission of the School of Engineering is to conduct educational programs in science and engineering that are relevant to the needs of the Air Force.

In fulfilling this mission, the school is engaged in three major areas of academic activities; degree programs, research, and professional continuing education (PCE).

The degree programs in the school include 12 master's programs and a doctoral program. Curricula in these programs are designed to provide the graduate with scientific and engineering education which will be needed throughout a professional career.

The overall goal of the School of Engineering is to help AFIT maintain its status as a world class technical institute. The achievement of this goal requires the development of strong educational programs in science and engineering, and contributions through basic and applied research on the level of major universities and research institutes.

School of Systems and Logistics

The School of Systems and Logistics is the graduate school of management for the Air Force. It provides graduate degree programs in logistics management, engineering management, and systems management, and 66 graduate continuing education courses in technical management.

The curricula in the degree programs are tailored to meet Air Force needs and include some 40 percent defense-oriented material. The logistics management program offers the student the option of focusing on general logistics, transportation, contracting, supply, maintenance, international logistics, and acquisition logistics.

Similarly, the systems management program has two tracks, a general systems option and a cost analysis option. The engineering program is focused to serve the Air Force Civil Engineering community.

These programs are designed to lead to the master of science degree in a continuous 16-month program. Each student is required to complete a research project and write a thesis.

The significant portion of the mission of the School of Systems and Logistics is to continue the technical management education of the Department of Defense work force. Repetitive classes in such vital areas as defense data acquisition, contract law, depot level maintenance management, and productivity improvement are offered to over 16,000 students per year.

School of Civil Engineering

The School of Civil Engineering mission is to provide relevant continuing education in engineering and management to Air Force civil engineering professionals.

Updating these professionals' knowledge of state-of-the-art technology in electrical, mechanical, civil, and architectural disciplines is critical to the Air Force civil engineering mission.

The scope of the school's programs has been expended to include a resident graduate degree-granting engineering program. This program could initially be implemented at the scale of the present graduate engineering management program, with 25 students supported by two full-time faculty members.

With the additional faculty authorization anticipated in the near future, the school will be able to expand its efforts in both applied research and consulting activities.

In the next five years, the school plans to become the center of excellence for the Air Force Civil Engineering's new information management system of the future.

The recent contributions made by the school in design policy and generic controls system analysis are just the beginning of where the school can and will advance the state-of-the-art.

Civilian Institution Programs

The Civilian Institution Program manages Air Force officers and airmen attending civilian educational institutions.

The goal of Civilian Institution Programs is to meet educational needs which cannot be accommodated at the resident schools. Although most CI students are enrolled in civilian universities in traditional academic programs, some students are in programs which have been developed specifically to satisfy special requirements of the Air Force. Examples of these programs include continuing education courses for chaplains, safety officers, and law enforcement officers, as well as the basic meteorology program.

AFIT Research in Engineering & Logistics

Research is an integral part of the Air Force Institute of Technology's mission. Indeed, it is essential for graduate level education. Research contributions of students at AFIT are already significant.

Information processing and pattern recognition research includes continuing research in speech recognition, scene analysis, neurological data processing, and robotics. Results have shown great promise for providing solutions to problems encountered in



the Advanced Fighter Technology Integration program.

At the request of the School of Aerospace medicine at Brooks AFB, Texas, and the Aerospace Medical Research Laboratory at Wright Patterson AFB, Ohio, a joint research program was initiated at AFIT to investigate methods for controlling motion sickness encountered by air crew members.

The joint research effort resulted in the design and construction of a motion sickness simulator to study the physiological and psychological cor-

relates of motion sickness and the effects of these parameters on the bio-feedback training.

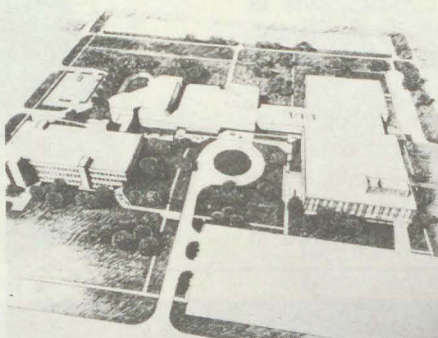
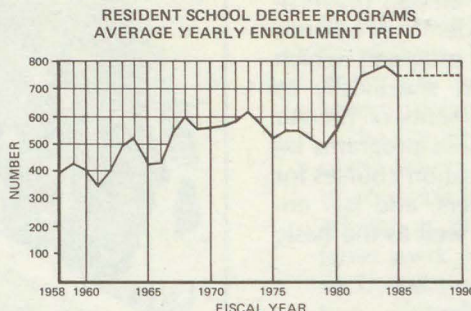
Artificial Intelligence, a branch of computer science concerned with making a computer perform tasks which when done by human beings are generally agreed to require intelligence, is the focus for AFIT research in two areas. One is expert systems, programming a human's expert knowledge into a computer to help mission planning, aiding in cockpit decisions, and automated maintenance systems.

The other is "natural language," which concerns the design of computer programs that understand typed or spoken human communications. Recent efforts are focusing on writing computer programs which can recognize and understand human speech in noise-corrupted environments.

Other initiatives include plans for an Artificial Intelligence Center which will consolidate research and educational opportunities in both the School of Engineering and the School of Systems and Logistics, primarily to consider Air Force applications. Additionally, it will offer facilities and computers for use by visiting faculty members.

Two School of Systems and Logistics students studied the order and ship time computations for stocked local purchase items. Their goal was to identify deficiencies in the existing Air Force methods of computing order and ship time and to develop a more accurate method. The students were able to work out a predictive model based on significant influential factors, and the recommendations have been implemented by the Directorate of Maintenance, Engineering, and Supply, DS/Logistics and Engineering, HQ USAF.

Productivity research is also conducted in the School of Systems and Logistics. Researchers analyze Air Force organizations to determine their efficiency and effectiveness. The results pro-



vide information to Air Force leaders to help conserve resources or improve effectiveness.

AFIT's School of Systems and Logistics is becoming the center for "Quality Circles" research in the DoD. The "Quality Circles" process starts with a small group of people with a common bond. They meet regularly to identify, analyze, and solve work related problems, and then they apply problem solving techniques to specific work areas often resulting in significant cost savings to the organization or company employing the process. The average return on investment is about four to one.

As a result of the extensive student and faculty research accomplished at AFIT, the Institute maintains a creative and stimulating educational process. In addition, AFIT faculty and student research has helped their Air Force and other DoD sponsors to avoid an estimated \$17 million in research costs during 1984.

The planned development of the AFIT Science and Research Center will provide an ideal environment for the Institute to continue to expand on its record of excellence.

In Summary

Gen. Charles A. Gabriel, Air Force Chief of Staff, has said that "the future of the Air Force depends on the 'Three-T's' - tactics, training, and technology."

At the 1983 AFIT Association of Graduates symposium he also said that "the past year has seen AFIT aggressively supplying all three 'Ts' for the future." Educating future pioneers in science and technology is AFIT's mission. AFIT is graduating not only the state-of-the-art scientists and engineers, but also operational leaders needed to field and manage the nation's aerospace resources.

As General Gabriel has said: "AFIT's today is the Air Force's tomorrow."

