A New Research and Laboratory Facility

The School of Engineering has acquired, through government surplus, a computer which was part of a Titan I missile guidance system. Thirteen other universities have received similar systems and a user's group and spare parts pool is being formed. These special purpose digital computers are capable of internally stored programming with 35 sophisticated instructions, each requiring 6 usec for execution time. These computers were programmed to: (a) solve guidance equations for different targets, trajectories, and indexes of refinement of the atmosphere, (b) determine errors in slant range, azimuth, and elevation, (c) issue steering orders, and (d) issue orders to pre-arm the missile if it fell within the "hit-box." Miss-distance calculations were printed with the digital data printer and position data were recorded on tape so that the entire flight could be evaluated.

Basic computers include the control unit, arithmetic unit, magnetic core memory, magnetic drum storage, and the digital-to-analog converter.
(Continued on page 4)

More Graduate Students Than Undergraduates?

The faculty of the School of Engineering is the strongest in its history. Of the 44 full-time faculty members, 31 now have their doctorates. Almost all are engaged in research and all teach both graduate and undergraduate students. Academic teaching loads have been reduced and we are convinced that our students have an extraordinary learning opportunity.

Yet we have a problem: The number of undergraduate students is too low. For the last several years the number of entering freshmen has averaged just slightly over 100 students, while the graduate enrollment has been climbing from several dozen to over 150 students. This shift in balance is not intentional on our part and does not represent a lack of interest in the undergraduate or a change of objectives for the School. We should point out that we have as many good-to-excellent students in this starting class of 100 as we used to have in the beginning groups of 160 and more. As the University standards of admission have gone up.
(Continued on page 4)

DR. WALLACE TO SPEAK

Dr. Wayne Paul Wallace, CE '34, Dean of the College of Engineering at the University of Southwestern Louisiana, will address the Society at the November 5 annual meeting.

Dr. Wallace received his PhD (elasticity) degree at Cornell University. He has published several articles in technical journals and is a member of ASCE, LES, the International Association for Bridge and Structural Engineers, the U. S. Council for Soil Mechanics and Foundation Engineering, and Tau Beta Pi. The topic of Dr. Wallace's talk will be "What's It All For?"

HOMECOMING AGENDA SATURDAY, NOVEMBER 5, 1966

Please note that all of the homecoming activities will be in the afternoon this year because the football game is a night game.

2:00 PM Registration for Annual Meeting, Society of Tulane Engineers, Room 205 Mechanical Engineering Building.

2:15 PM Meeting called to order by Mr. Nestor B. Knoepfle, CE '40, President STE.
Speaker: Dr. Wayne Paul Wallace, BS in CE '34, CE '36, Dean of Engineering, University of Southwestern Louisiana.

4:00 PM Annual Meeting, Tulane Alumni Association, University Center.
Speaker: Fred Inbau BS '30, LLB '32, Professor of Law, Northwestern University.
Alumni Supper, University Center immediately following meeting.

7:30 PM Tulane University vs. University of Miami.
Open House, Alumni House immediately following the game.

All Engineering Alumni are urged to attend the STE meeting and the other homecoming activities. We will be looking forward to seeing you on November 5.

(Continued on page 4)

FACULTY PROMOTIONS

Six members of the School of Engineering faculty received promotions in rank, effective July 1, 1966.

Promoted to the rank of Professor: John L. Martinez, Mechanical Engineering (he is also Assistant Dean of Engineering); Dr. Dale U. vonRosenberg, Chemical Engineering; Dr. Robert E. C. Weaver, Chemical Engineering.

(Continued on page 4)
THE DEPARTMENT OF ELECTRICAL ENGINEERING

James A. Cronich, Head

Following is the fourth of a series of articles on the departments of the School of Engineering.

Four years ago, the changes in curriculum, facilities, and faculty which had taken place in the Department of Electrical Engineering during the preceding twenty-five years were discussed in the TULANE ENGINEER. Since then, no major changes in curriculum have been made, but emphasis in certain areas has shifted and new elective courses have been introduced according to the wider range of faculty interests and the advances in Technology. A new laboratory, well-equipped for instruction and research in microwaves, has been the most important addition to our facilities. The major changes have been in the academic backgrounds and the research interests and activities of our faculty. Therefore, in this issue of the TULANE ENGINEER, I shall acquaint you with our 1966-1967 electrical engineering faculty.

The Electrical Engineering Faculty.

Since I have been at Tulane as undergraduate and graduate student and faculty member almost continuously since 1931, except for 1937-38 at MIT and 1941-42 with the Panama Canal, nearly every reader knows me and most know that for the past twenty years I have also been associated with a team in the Department of Medicine engaged in various phases of cardiovascular research.

Professor Daniel H. Vlieet graduated in our class of 1950 and then joined our faculty as instructor. Several summers of graduate study at the University of Michigan led to the M.S. His formal studies were topped with the Ph.D. from the University of Wisconsin in August 1965. At one time or another, Dan has taught most of the courses offered by the department, but his major interests have been in electric power, energy conversion (his doctoral thesis was titled "The Thermoelectric Energy Converters"), and control systems.

Professor C. J. Sperry, Jr. was appointed instructor of electrical engineering in 1948 after graduating from Clemson. Summer graduate work in illuminating engineering at the University of Illinois led to the M.S. in 1954. Jack is in charge of our courses in illumination and acoustics. Through his efforts, the department has one of the best acoustic anechoic rooms in the South.

Associate Professor R. L. Drake graduated in the class of 1950. After four years with the Buckeye Cotton Oil Company, he returned to Tulane as instructor and after part-time graduate work received the M.S. from Tulane in 1957. Bob joined Space Technology Laboratories in 1959 and studied in the area of control systems at UCLA. He returned to New Orleans in 1962 to work with IBM and rejoined our faculty in September 1962 to become director of the NASA-sponsored research program of the School of Engineering on the propagation and effects of sound and vibration from rocket firing. A year of resident study at Mississippi State in 1963-1964 under an NSF Science Faculty Fellowship and a year of intensive research for his thesis "Stability Investigation of an Adaptive Control System" resulted in the Ph.D. from Mississippi State in June 1965.

Associate Professor George W. Webb received the B.S. from the University of Alabama, the M.S. from Columbia University, taught at Alabama, and engaged in transformer design for the General Electric Company before coming to Tulane in 1955 as assistant professor of electrical engineering. George is in charge of instruction in electric machinery and electric power.

Associate Professor Charles H. Beck studied at the University of Missouri (B.S. in EE in 1952) and the University of Kansas (M.S. in 1956 and Ph.D., 1964). His doctoral thesis was "Transformation of Two-Dimensional Spatial Information into Single Channel Pulse-Amplitude Modulated Signals." Because of his interests in digital data processing of biomedical information, his appointment to our faculty in July 1964 included a dual appointment with the Tulane Biomedical Computing System.

Assistant Professor E. P. Williamson joined us in May 1965 after receiving the Ph.D. from the University of Florida. His doctoral thesis was titled "Analysis of Errors in a Frequency-Modulated Radar Altimeter Arising from Ground or Sea Clutter." He has introduced a series of advanced undergraduate and graduate courses in statistical decision theory and communication theory.

Assistant Professor Hans Gober is a native of Germany. He received the Doctor of Engineering degree from the Technical University of Berlin in 1963 with the thesis "Acoustical Radiation in Flat Rooms." His major interests are sound propagation, acoustics, and sound and acoustics measurements.

Associate Professor Y. J. Sato is a native of China but has been in the United States since 1951. He studied at the University of Idaho (B.S. in EE, 1957), the University of Washington (M.S. in 1960) and the University of Texas (Ph.D. in 1964). He taught at the University of Texas and the University of Houston before joining our faculty this summer. Jo's doctoral thesis was "The Cylindrical Magneto-hydrodynamic Waves in Plasma."

Paul Duvoisin, instructor of electrical engineering, is on leave of absence this year to work toward the Ph.D. at the University of Wisconsin under an NSF Science Faculty Fellowship. Paul, a Tulane graduate of 1946, received his M.S. in 1962.

Robert Roed (B.S. in EE, 1957) returned to Tulane as a research assistant in February 1965 after almost eight years with the Transformer Division of Westinghouse Electric Corporation. He applied the digital computer to design distribution transformers. Bob has been teaching several courses on digital computer programming through University College.

Four years ago none of the electrical engineering faculty held the doctorate. Now six of the ten teaching faculty have the doctorate and one is working toward it. There has been an increase in research activity and in graduate work. Eight men expect to receive the M.S. in electrical engineering in June 1967. The department intends to request permission of the Graduate School to inaugurate a Ph.D. program in electrical engineering. We feel that our faculty and facilities are an excellent nucleus for continued departmental growth.

NEW ADDITIONS TO THE FACULTY

DR. YEB JO SETO, Associate Professor of Electrical Engineering, comes to Tulane from the faculty of the University of Houston. Dr. Seto received his Bachelor of Science in Electrical Engineering from the University of Idaho, M.S. from the University of Washington and Ph.D. from the University of Texas. His principal field of specialization is electromagnetic theory.

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THE TULANE ENGINEER
Published by the Society of Tulane Engineers, whose offices are:
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October 1966

PRESIDENT'S MESSAGE...
Certainly each and every Tulane Engineer has a right to be proud of his School's high standards and its reputation among the institutions of higher learning in the United States and abroad.

Living up to these standards, and making incremental advances to keep pace with modern demands in engineering education takes much in the way of financial support, particularly for privately operated schools such as Tulane.

One of the primary aims of the STE is to supply on an annual basis some unrestricted funds for special and urgent needs of the Engineering School. Each year since 1956, through the collection of dues from alumni, your Society has been able to contribute a small amount of money for these worthy purposes. Over the past ten years the total that has been given amounts to $3,800, with $1,000 of that amount being given last year.

The Alumni Association informs us that they carry on their list of Engineering School Alumni a total of 3,576 individuals. One really doesn't need higher mathematics, or even modern mathematics to see that the money STE has contributed to the School amounts to the grand and enormous sum of TEN and ONE HALF cents per Alumnus per year. This is indeed a sad showing.

It is to be hoped that indifference is not the cause but rather that good intentions did not materialize.

At the annual meeting of the Society October 30, 1955 the dues were placed on an annual basis from January 1 through December 31. So far this year we have received payment of dues from approximately 650 Alumni out of the potential 3,576, this amounts to an 18% participation which most assuredly can and should be improved.

We have a real opportunity to aid the Engineering School in another way too by paying our dues this year, because, during the lifetime of the TULANE FORWARD FUND, Ford Foundation will provide the University with funds to match one half of our contribution. Last year we obtained $500 from this source, which added to our $1,000 resulted in a more substantial gift.

Please help your Society to help the Engineering School. If you have not sent your 1966 dues, sit down right now as you read this appeal and write your check for $3.00. It will be put to good use! Checks should be mailed to Mr. Frank S. Foster Jr., Treasurer, Society of Tulane Engineers, 9425 Mark Lane, New Orleans, La., 70123.

Your officers join me in extending to you an invitation to the annual meeting which will be held on November 5, 1966 (Homecoming) at 2:00 P.M. in room 206, Mechanical Engineering Bldg. on the campus.

Nestor B. Knoepfler

FOOTBALL SCHOLAR
Every time Uwe Pontius kicks a field goal for the Tulane Greenies (which is almost always) he's kicking a little bit closer to his primary goal—an engineering education.

The German-born, blond giant has tried his hand at several things in pursuit of an engineering degree and football has proved a boon to him as well as the Greenies. As all Tulane football fans already know, Uwe (rhymes with hoo-va) is the Green Wave's ace place kicker and holder of Tulane's high point record last season. He's the holder of several other records—including (as one sports writer said) having the most frequently misspelled and mispronounced name of any football player in the country. Uwe racked up 17 points from field goals and extra point kicks last season and after the first five games this year has completed 12 out of 12 extra point kicks and four field goals, totaling 24 points. The "200-pound scholar" (as sports writers are fond of calling him) has probably garnered these laurels with less playing time than any other Greene letterman in history—not more than two minutes on the playing field for all his points. His record last season prompted the coaches to overbook their rule of a 60 minutes minimum playing time to award Uwe a letter, despite his brief field play.

Besides his letter, Uwe has earned a partial athletic scholarship, which

(Continued on page 4)

OFFICERS TO BE ELECTED
Election of officers for the 1967 term will be held at the Society's annual meeting on Saturday, November 5, 1966.

The following slate of officers is proposed by the Nominating Committee:

President—DEWITT L. MORRIS, ME-EE '37
1st Vice President—JOHN E. COLES, EE '56
2nd Vice President—FRANK S. FOSTER, JR., CE '56
Secretary—JAY W. OPPENHEIM, ME '56
Asst. Secretary—JAMES A. EVANS, '43
Treasurer—CLAUDE J. KELLY, JR., CE '51
Asst. Treasurer—GUY J. SHERS, JR., CE '56
Director & Publications Chairman—WILLIAM R. LECORNE, CE '59
Director—MICHAEL C. ABRAH, ME-EE '24

ADDITIONS TO FACULTY—
(Continued from Page 2)

DR. KENNETH H. ADAMS, Assistant Professor of Mechanical Engineering, received his B.S., M.S. and Ph.D. degrees in Mechanical Engineering from the California Institute of Technology. Materials science is his field of specialization. He is the author of several papers on that field published in journals of materials science and physics.
RESEARCH FACILITY—
(Continued from Page 1)
(input/output). The magnetic core storage provides nonvolatile, high speed, random access storage of 256 twenty-four bit data words. A current of 350 ma. for 5 usec is required to switch the state of a bit in the core. Magnetic drum storage provides nonvolatile, medium-access time storage for 8192 seventeen bit program words. The operator's console contains indicator lights showing the data contents of most of the computer circuitry. Flip-flop indicator lights also serve as manual set and clear push buttons.

All logic and functional circuitry is mounted on etched circuit boards in hermetically sealed containers. Functional circuits are the standard OR, AND, INVERTER, and flip-flop. Diode transistor logic uses PNP transistors. A logic ONE is represented by a high voltage (ground) and a ZERO by a low voltage (—2 volts). Arithmetic operations are executed in the fractional binary system.

To date, the twelve computer cabinets have been mounted on a wooden base in the laboratory. This base, 20½' long, 13' wide and 10' high, provides space for inter-cabinet taping and air-conditioning ducts. Inter-cabinet taping is completed, but air-conditioning and power at 440 volts, 3 phase, are yet to be installed. Plans are under way to interface with existing equipment from the various laboratories, as well as a hybrid linkage with analog computers for a study of control systems. The design and operation of the logic and functional circuitry and the logical processes are being studied in connection with a senior-graduate course, Digital Logic Systems Design.

FOOTBALL—
(Continued from Page 3)
along with his full academic scholarship, allows him now to follow a full time engineering curriculum. He came to Tulane from Bethany, Oklahoma, a suburb of Oklahoma City, in 1963 on an academic scholarship, but soon discovered he needed part-time work to meet his financial needs. For a time he worked at drafting 8 to 10 hours a week at the Public Health Hospital—receiving board and room. Later he was research assistant to John Martinez, assistant dean of engineering, on the Whiplash Project—for this he divided his time between the Medical School and the uptown campus.

Meanwhile he garnered a little attention by his performance in the annual Intramural football game and decided to go out to football practice on his own and let the Tulane coaches see what he could do. After looking him over, they let him have a few footballs and told him to practice by himself. That he did and everyone who reads the sports pages knows the rest.

His academic background coupled with his kicking success has gained him unusual attention and he has been "good press" for the Greenies.

Uwe is now a full time junior in mechanical engineering and expects to receive his degree in 1968.

PROMOTIONS
(Continued from Page 1)
Promoted to the rank of Associate Professor: Dr. Charles H. Beck, Electrical Engineering; Dr. Robert L. Drake, Electrical Engineering.
Promoted to the rank of Assistant Professor: Dr. Daniel Kileen, Chemical Engineering.

GRADUATE STUDENTS—
(Continued from Page 1)
so has the quality of the student body in Engineering as well as in the other divisions.

While the program is faster-paced than it used to be, the modern student can keep up. In fact, the ratio of students graduating to those beginning is probably the highest it has ever been. In the Fall of 1966 we have over 70 seniors, whereas the freshman class of 4 years ago numbered less than 120. We are very pleased with the fact that increasing percentages of our students are successful in our program—our difficulty is with too low an input in numbers.

Hence, we solicit your help and guidance. If you know of bright young students who are trying to choose a profession and a school in which to prepare themselves for that profession, let them know of the fantastic opportunities a waiting the young engineering graduate today and, particularly, of the educational opportunity available at your Alma Mater. The stimulating atmosphere offered to the undergraduate student and the close contact with engineering professors in all engineering courses from the freshman through the senior year make for an unusually fine learning situation.

If you have ideas concerning recruitment or know, personally, of an outstanding high school prospect, let us know and we will follow up. Like most engineering schools, our output is not nearly meeting the demand but we have the faculty and facilities to do more at the undergraduate level if we can get the message to prospective students.