The unusual architecture of the Aeronautical Engineering Building on the North Campus is indicated by camera study of light pattern in central room.

They Work as They Learn

The students enrolled in Department of Aeronautical Engineering are getting a chance for practical experience as well as theory.

By BILL BROCK, '55journ

THROUGH THE CRISP CHILL and stillness of early morning the distant whine of airplane engines often drifts across the campus at the University of Oklahoma. In the beginning the engines' roar is just a sudden, powerful surge as some pilot at O.U.'s Max Westheimer field turns up for a magneto check.

Then the roar subsides, and for a while it's still once more. Shortly the sound comes again, in a steady, ever increasing whine. It's the sound of power biting into the air and pulling another plane skyward.

The plane's flight path takes it by the campus, just to the west. Then one wing dips, and the aircraft starts a graceful bank to the left. You track it around, as it passes over the Administration Building and un-

til its course has cut an arc across the campus. Then the miniature liner points its nose north and the wings settle on an even keel.

By then you know that you've been watching an Aero Commander taking to the air on another mission in the business world. But what you probably don't know is that O.U.'s Aeronautical Engineering School has had a part in putting the plane on its flight, just as the AE School has helped with many other projects in the world of the air.

But this is more than just one case involving AE students working in the aircraft industry, as they are at Aero Design and Engineering Company experimental department at North Campus. It also exemplifies a basic concept of teaching areonautical engineering at O.U.

"Students derive a definite advantage by working while they learn," said L. A. Comp, professor of aeronautical engineering. "We find that if students work during their junior and senior years, they more readily see what they want to do in aircraft engineering and what to look for in terms of what to learn. Their interest in courses O.U. offers in aircraft structure and design is sharpened by this work."

Although there is no set program with aircraft companies for working students, there are always jobs available for those who can fit it into their schedule.

Progressive thinking in education is not a recent development in the AE School. As early as 1927, O.U. became one of the first colleges in the United States to establish an aeronautical engineering curriculum. In the beginning it was made an optional program with the Mechanical Engineering School and the Department of Engineering Mechanics.

Since that time working as they learn has seemed to be the by-word of students. In 1930, students designed the first of the wind tunnels O.U. was to have. It was a far cry from the super-sonic wind tunnel in the new jet propulsion lab started in 1953 on North Campus. But both carry the mark of student and faculty work.

Beginning with that first small tunnel students built in 1930, with which they tested streamlined models of cars and buses, the school moved on to bigger tunnels. In 1936, the first of their small scale windstorms encouraged faculty and students to design and build a commercial-sized wind tunnel. This was only one step on the way to the super-sonic tunnel that was designed by L. F. Smith, AE instructor, and constructed in part by students, and now stands on North Campus.

The contrast in tunnels well exemplified the strides in instruction. The commercial model now in use on Main Campus will produce winds up to 200 miles per hour. The super-sonic tunnel on North Campus is capable of wind velocities up to Mach 2.5 (about 1,500 miles per hour) and that's no little blow!

Practical problems from the aircraft industry are giving O.U.'s aeronautical engineers a chance to earn and learn.

Keeping in step with the super-sonic age, it was just recently that the Aeronautical Engineering School was able to put classroom know-how to work.

Old tow targets used by the Air Force were of the wind sock type. But these could not be picked up by radar men on their radar scopes. When the Del-Mar Engineering laboratories developed a cigar-shaped radar target that alleviated this problem, the Air Force experienced difficulties in streaming the target at the beginning of a mission, or retrieving it when the mission was complete.

Woodrow W. Wilson, '50m.eng, working at Tinker Air Force Base, designed and built a wing tip tank receptacle with an air driven reel to do the job. But at the high speeds that modern aircraft operate, all tests of the device were unsuccessful.

Then the AE School and their wind tunnel were called into play.

Comp and Bruce V. Ketcham, chairman of the School of Aeronautical Engineering, with the help of AE students, went to work on the tow target with their tunnel. After several tests were run on launching and retracting the target from its wing tip tank receptacle, a few alterations were made and the tow target was once again flight tested. This time the tests were a success.

When, in 1950, the Aero Design Engineering Company opened an experimental department, the facilities of the AE School didn't go unnoticed. In that year Aero Design was working on a new model Aero Commander. It was different from their first model, the 520, and with a change in design came new flight problems.

They were chiefly concerned with two things, the air flow in the cabin region and the relative drag between a larger fuselage and the old prototype. The students and faculty of the AE School were once again able to use their wind tunnel.

Using small strips of yarn to indicate the air flow across the body of an Aero Commander model, running successive tests and marking their findings soon resulted in licking the problems of air flow and drag.

But the school isn't limited to their wind tunnels alone. This is only a small part of the work they do.

They were able, about one and one-half years ago, to put their aircraft know-how to work on testing the noise level in the Aero Commander. They were incorporated as a part of a general program in noise elimination being carried on by the company.

With two engines turning up 275 horsepower each perched on the wings just a propeller's length from the cabin, the exhaust roar created a problem. After running bench tests, students and faculty worked on different methods of exhaust muffling that aided in solving the over-all noise problem in the plane. The final satisfactory result was achieved by a muffled exhaust system, incorporating 3-bladed propellers, and moving the engines farther out from the cabin.

Once again the AE School was called into action on the Commander's exhaust system. But this time to run tests on an exhaust augmenter.

The purpose of the augmenter is to take energy from engine exhaust gases and use it to pull cooling air in through the engine cowling and over the cylinders. The school ran tests to locate the best and most effective position of the augmenter for cooling and still remain within the close dimensions of the engine housing.

The job was undertaken, and another success was marked up on the AE School scoreboard of functional accomplishments.

But the school doesn't wait until it's called in on some special task to go to work. Several O.U. students and former students work with Aero Design on part and full-time basis.

Comp and Ketcham also work on a part-time basis with the company. They do special jobs in engineering as needed to complete new models or further work on current models. They have also been called on to do special studies on the Aero Commander by the Director of Research and Development of Aero Design Company.

It has been said that those who look to the future should look to the air. This is a point well taken by students and faculty of the Aeronautical Engineering School. And the next time you're in Norman, or walking across the campus, look to the air above. You may see an Aero Commander winging its way across the sky.

Remember—it's not only an airplane, but a graphic example of how teaching at O.U. is functional as well as theoretical.