

AVIATION

Miniature Airplanes Now Fly Freely in New Test Tunnel

Ailerons and Rudders Are Controlled by Magnetic Fields Acting on Electro-Magnets Aboard Models

MINIATURE airplanes take off and maneuver for the sake of science in the world's first "free-flight" wind tunnel just demonstrated for the first time by the National Advisory Committee for Aeronautics at its laboratories at Langley Field, Va.

Instead of the small counterpart of a full-sized airplane being held conventionally in an experimental blast of air, the artificial breeze is increased until the model takes off by itself and flies freely. Then ailerons and rudder are controlled by magnetic fields acting on small electro-magnets in the model's wings. The scientist in charge maneuvers the test model plane just as a pilot handles a real one.

"We expect that this new method of studying airplane stability and control will give us much information directly that we have hitherto obtained theoretically or by empirical estimation," said Dr. George W. Lewis, N.A.C.A. director of research.

"Bumps" or gusts of wind are measured and studied by two new devices made by N.A.C.A. experts.

One of these is a bump recording instrument small enough to fit into the pocket. About 160 of these instruments are placed in airplanes and seaplanes of different types during actual flight. One of them has been carried by the China Clipper on round trips between San Francisco and Manila. From the curve traced by the instrument, engineers are able to reconstruct every roughness of the voyage and tell what stresses the craft withstood.

Gusts to Order

Gusts are made to order in a new tunnel and model airplanes are catapulted into them. As fast as an arrow is shot from a bow, the tiny plane is accelerated to 50 miles per hour in a few feet of travel. Hit by the gust, its action is recorded by a motion picture camera.

The famous N. A. C. A. cowling which streamlined air-cooled engines so effectively several years ago has been im-

proved and adapted to the 1500 horsepower engines developed in the past few years. There is an adjustable nose slot in the new cowling design so that the pilot can give the engine more cooling air while it is working hardest.

Reduce Power Needed

Just by reducing the size of rivets in an airplane wing by $1/32$ of an inch, it is possible to reduce the power necessary by 100 horsepower. This is one result of the experiments on the friction drag on the wings of large modern airplanes. In operating high-performance modern aircraft, the importance of smooth surface in a wing is so great that the N.A.C.A. experts suggest it may be found economical to have service crews wipe off accumulated dirt and dust on wing surfaces at every stop.

Large air transports leaving our airports in the future may be catapulted in order to assist their take-off and reduce the long run now necessary, if a suggestion of the N.A.C.A. is adopted. A catapult with half the acceleration of

gravity would reduce the take-off distance from 1800 feet to 1150 feet.

Science News Letter, May 29, 1937

AVIATION

Aerial Research Race On; U. S. Supremacy Menaced

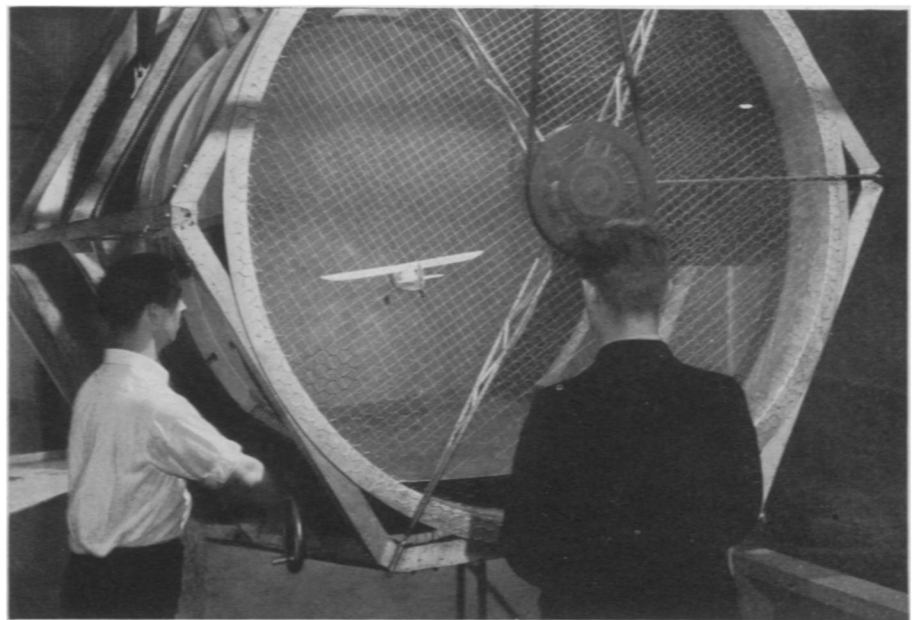
AVIATION today owes much to the men and apparatus in a group of buildings at Langley Field, Va. These laboratories of the National Advisory Committee for Aeronautics have changed the tempo and style of modern aeronautics.

Cruising speeds have jumped beyond 200 miles per hour, with greatly increased economy. Greater safety has been achieved, thanks to new methods of controlling aircraft. All because scientists have dreamed, tested and accomplished.

Manufacturers have learned to snatch eagerly the latest N.A.C.A. research findings. Next year's airplanes wear today's successful research results. Foreign war and commercial planes undergo metamorphosis as American advances become known.

Imitation is the most sincere flattery. But American aviation circles are a little disturbed over the large-scale duplication, with embellishments, of the N.A.C.A. laboratories by Germany, Italy and Russia. Millions of dollars are being spent on aeronautical research in those war-fearing countries.

Uncle Sam's researchers are pushing ahead on new developments: Learning



FLYING FREE IN WIND TUNNEL