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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS.

TECHNICAL MEMORANDUM 116

RESUME OF THE ACTIVITIES OF THE AERONAUTICAL EXPERIMENTAL INSTITUTE, ROME,

During the Months of May, June, July and August, 1921.

From "Notiziario di Aeronautica" No.9,
October-November, 1921.

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Laboratory.

July, 1922.

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RESUME OF THE ACTIVITIES OF THE AERONAUTICAL EXPERIMENTAL INSTITUTE, ROME,

During the Months of May, June, July and August, 1931.

The Aerodynamical Section studied:

The aerodynamical characteristics of a very thick concave-convex wing; the disturbances caused in a tunnel by the presence of a disk, placed in relation with a transversely infinite barrier; vertical pressure in a wing of low head resistance; the drag caused by two small doors in the sides of the fuselage; depressions in the interior of the model of a wing; the influence of a conical casing fitted with helicoidal flanges centered on the hub of the propeller; the influence of the velocity of translation on the aerodynamical effects of the propeller; and the influence of a honeycomb placed in the tunnel.

The Section also took up the question of participating in the Turin Aeronautical Show, organizing an exhibit of designs, models, and special aircraft illustrating the activities of the Institute. The Section also studied the transformation of the moment balance by measuring the baricentric couple and a new system of installing the Froude tank car. Experiments were made to determine the distance taken in starting the car for a run at high speed. A model of the Piccione propeller was tested; the calibration of a recording anemometer was tested; the behavior of the model of a hangar under the action of a frontal, horizontal wind was

* From "Notiziario di Aeronautica," No. 9, Oct.-Nov., 1931.

studied.

THE AIRCRAFT SECTION examined: The project of a helicopter, by Alessandro; the diagram of the project of a helicopter, by Marchetti; the Fazi invention concerning boats driven by compressed air; the invention of the Antoni Brothers on the flexible wing; the Sarri proposition for transforming the Aviatik school airplanes by fitting them with Isotta Fraschini V.4 B engines; the Caproni Ca 3 and Ca 4 and Macchi M15 airplanes for various purposes.

Experiments were carried out on a variable pitch propeller; on the Ca 3 for comparative examination with the Ca 5 two-engine Sarri; on the influence of the fabric in the strength of the spars and ribs of the wings; for verifying the laws of similitude in the resistance of woods in collaboration with the Technical Section.

The following tests were made: Tests of ultimate strength and flying tests of the civil seaplane Savoia S 16; static test of the fuselage and landing gear of the FIAT B.R.; static test on the component parts of the wing of the B.R.; static test on the German Roland airplane; static test on the Macchi M.7 seaplane; static tests on the fuselage of the Fokker D.VII under conditions of landing, with fuselage inverted and with fuselage in normal position; on perforations in sheet metal in collaboration with the Technical Section; on the two-engine airplane Caproni with Sarri modifications; flying tests of two Breda triplanes.

Conducted inquiries: On the circumstances of the fall of the F.B.A. at Bassano di Sutri and of the S.22.

Arranged for forming a museum at Montecelio with German material and distributing it to polytechnical and industrial schools.

Completed the project of Engineer Guidoni for a model of an amphibian and had the model executed. Executed the design of a model of a variable pitch propeller for wind tunnel tests and finished the variable pitch propeller being built by the Aeronautical Construction Plant.

Formed part of the commissions: for the verification of the F.B.A. seaplanes at Vigna di Valle; for the inquiry into the incident of the Breguet at Montecelio.

Compiled: Rules for static tests of airplanes; a program of experiments on landing; measures and precautions to be taken in employing the seaplane Ca 5 for experiments in discharging aerial torpedoes.

Prepared the following reports for the "Minutes of the Institute."

Study on the longitudinal stability of airplanes; application of theoretical researches on vortices to the study of the propeller; theory of vortices applied to lifting wings.

THE SECTION FOR FULL FLIGHT TESTING made experiments on longitudinal stability, the official tests of the Macchi M.15, of the Caproni with Sarri modifications, of the Nieuport type 27, of the Breda triplane; began the tests of the Ca 3; prepared the installa-

tion of the instruments on the Pegna seaplane and took up the question of a base for the speed tests. Also took measures for the construction of an inclinometer; for the preparation of parachute tests; for the preparation for the official tests of the Fokker, Pfalz, Spad, Hanriot airplanes, and A.I.4 airplane struts.

The CHEMICAL SECTION analyzed samples (of malta?) sent by the Engineering Department; studied the means of stabilizing the limit of acidity of castor oil for aero engines; brought to a conclusion the study of some Austrian war material. Prepared a report "Light Alloys in Aeronautics" which was presented in September at the Trieste Science Congress.

THE PHYSICS SECTION again took up experiments on air vortices behind obstacles; began the study and construction of an electric thermograph specially adapted for use on airplanes since those now used do not answer quickly enough to the rapid variations of the temperature of the air, especially during rapid climbs in test flights. Studied a special modification of machine guns for firing through the propeller.

THE TECHNICAL SECTION continued the re-arrangement of the experimental laboratory, proceeding to the endurance tests of airplanes of 100 tons capacity, to the installation of airplanes of 15 tons capacity for tensile, compression, and bending testing, and to other work of the same kind.

Also carried out various tests on different materials and a long series of systematic bending tests on wooden test pieces, all of similar construction.

Is now studying a method of making a series of systematic tests on shocks. Compiled "Rules for the acceptance tests of tires and tubes for airplane wheels."

THE ENGINE SECTION has continued the assembling of material for establishing a new room for engine tests; has compiled the technical rules relative to engine driven aircraft for granting certificates of navigability; made experiments with the Helbig castor oil regenerator; tested German spark plugs, type Koff, and German high compression engines, type B.M.W. Proceeded to the acceptance test of a new Breda engine type A 2, 80 HP, and collected data on the American engine Liberty S. 12 cylinders, and on the power plant of the airplanes Ansaldo A.300 C and Macchi M.15 Studied the transformation of Fiat engines A.12 bis into commercial engines; studied special magnesium alloys for crankshafts, pistons, etc.

Translated from the Italian by Paris Office, U.S. National Advisory Committee for Aeronautics.