AIR GIANT BECOMES A REALITY

By WAYNE THOMAS

The Douglas Aircraft company of Mines, Calif., announced not a great while ago that the assembly of the giant new Douglas DC-4 had been completed. By the time this article appears in print the assembly of this new commercial airliner, the largest to be built in America, should be virtually completed. The plane is expected to make its first flight sometime during the latter days of this month.

The latest information concerning this huge massive aerodrome in earlier stories regarding this great ship which has been generated by this department. For instance, instead of having a weight of 40,000 pounds the machine will gross at 60,000 pounds, or 5 tons. With a 20,000-pound pay load the range, instead of being 1,900 miles will be 2,500 miles. The top speed will be 340 miles an hour at the most efficient altitude instead of 225 miles an hour, and the plane is expected to cruise at 250 m.p.h.

The designed sea-level landing speed is 65 miles an hour, but the Federal Bureau of air commerce regulations now permit landing speeds as high as 70 miles an hour for airplanes the size and weight of the new Douglas. Tests with smaller craft have shown that sizes as high as 80 to 90 miles an hour will not be excessive for large craft filled with the new safety and efficiency features which the Douglas company has put into the design of the DC-4.

Harry H. Wetzel, vice president and general manager of the Douglas plant, says that a total of 500,000 engineering-hours will have gone into the construction of the first DC-4 when the prototype plane is finished. The time consumed in developing a giant airliner from the drawing board to the finished product, according to Wetzel, was not so much a test of the difficulties and problems of constructing large planes as it was the careful research and testing of parts and now features the DC-4 incorporates.

Testing laboratory in charge of outstanding engineers was kept busy for more than two years hunting information on materials and designs. Most of the important parts of the plane were built and then deliberately and slowly destroyed in the testing laboratory to prove the calculations of engineers and designers. Special machinery and fittings were designed and built at the Douglas plant to carry out these tests. In all more than 100 major structural tests were conducted, requiring 1,000 engineering and shop hours, to prove and check engineering designs and stress calculations. One of the most outstanding of these tests was the destruction of the outer wing sections to test the strength of the skin. The original built-up section was destroyed by a blast of air and the strength was approved by the engineers.

The development of streamlined type wings involved the use of flash-type rivets, which are more durable in production than the ordinary rivets with small protruding heads. Wind tunnel tests, however, disclosed that the flash head added considerably to the performance of the big plane, so this type of rivet was adopted and a number of tests were made to check its strength and in perfect tools which will enable it to be used with almost as much speed as the older type.

Also a part of the engineering tests on the wing involved the building of strips of metal for the deicing shoes or boot. The wing on the prototype plane was constructed so that the curve of the leading edge would be virtually equal to that of the deicer boot attached or off. All present tests showed a very substantial amount of efficiency when the boot is attached for winter operations, because the pure wing curve is changed. Not as the DC-4.

In building the new ship it was necessary to first test and a number of new materials as well. Separate, independent systems for supplying electricity, cooling, heating, and control operations had to be designed and created. It was necessary, for instance, to design and build special locks for all the control surfaces of the DC-4, because as it is too large for any hangar now in existence and consequently must be left outdoors. This was a greater problem than at first may appear. The need for the body was great. So large are the control surfaces—ailerons, rudder, and elevators—that they might be seriously damaged if housed around by gusty winds. The body had to be long enough to resist the wind forces, yet small enough to be carried in a hangar. The design may still be made with the controls locked.

The Douglas engineers were somewhat reluctant to this repetition of the disaster that overtook the Boeing company's first 208 flying fortress bomber when it crashed at Wright Field, Dayton, as two army pilots took it off with the controls locked. This problem finally was licked, but it involved more hours of engineering work.

Because the airplane is so large, it January was most probably the direct result of a structural failure caused by vibration.

All told the DC-4 will have cost $30,000,000 by the time the No. 1 ship is completed. The cost is greatly increased by the Douglas company, United Air Lines, Continental and Western Air, American Airlines, Pan American Airways Corporation—subsidiary of Pan American Airways system—and North American Aviation, Inc.

The dimensions of the ship may vary somewhat, but it will be 136 feet 6 inches; the fuselage will be 97 feet 7 inches long. On its triple landing gear, which will keep the ship in a level attitude even on the ground, it will stand 28 feet 6 inches above the ground. Entrance door to the cabin will be 6 feet 4 inches off the ground, the ship is the new.

In the opinion of the authors, writing reprinted on this page indicates the fact that it is not the men, but rather the words. It may well be said, however, that the DC-4 will be approximately three times as large as the DC-3. Visitors to the International Air show at Chicago last month will remember the size of the DC-3—largest plane on exhibit there.

The aerodynamic characteristics of the DC-4, like that of the DC-3, are so designed that after 136 feet 6 inches the body is completely streamlined. As the airplane is so large, it is being equipped with a separate pair of motors for generating electricity, with a new type of heating and ventilating unit, with valves which will enable the operators to supercharge the engines at will for high-altitude operation, many special problems were met which have not been encountered elsewhere. One of the most difficult involved a study of vibrations of the various parts for all the different speeds and conditions which might be met in operation on the ground.

Vibrations of the turrets, wings, spars, skins, etc., causes fatigue. Fumes from dust on the floor can cause respiratory conditions. The crush of Northwest Airlines Lockheed 14 in Montana last

The Palm Beach socialite whose routine is very expensive and very last word, including the young man with the most London accent, who is visiting her on Sea Spray Ave.

The Florida bathing beauties who are constituent for something and don't mind a bit being the news camera. A lucky winner will be "Miss Miami," or "Miss Lake Worth," or "Miss Carol Galveston," and her family will be very proud of her.

The young man from Portland, Maine, and the other comes from Birmingham, N. D., and they are wistfully watching the camera. Nothing pleases them more than letters from home telling about snowdrifts and icy blizzards.

The Hilalas girls who follow the police. They try to dress so you can see them coming from a long way off. That goes for Harry, too.

By W. E. HILL

The Florida Gals

FLORIDA GALS

March 6, 1938

The Ringling School of Art.

Hillside girls who study at the Ringling School of Art. Wonders whether she will be her next palm tree after the manner of Courbet, Gauqsin, or Marie Laurencin. (The package down by her foot is Ranch.)

Ridie, the curb service girl, appreciating a customer's linen, has heard it before but she's kind-hearted.

Florida homes and guest. They are driving around Ormond and the boisterous is showing her the Rockfield house, etc. The guest is admiring everything so hard her eve are popping from the strain. (She's the kind of guest who brings all the wrong clothes and has to borrow.)

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