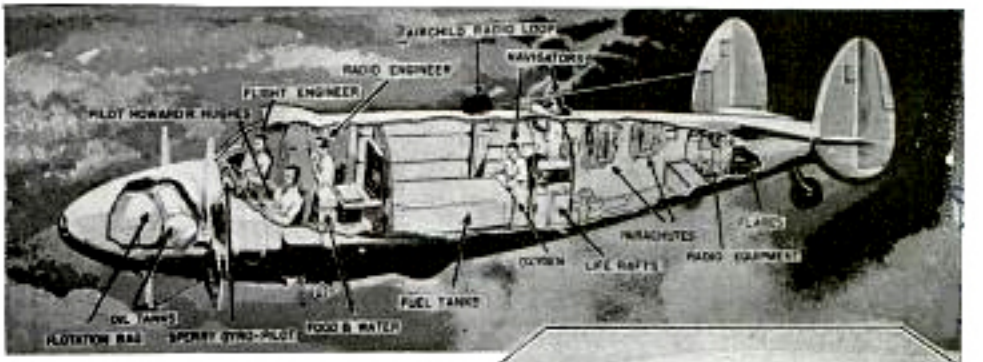
AROUND *the* WORLD *in* 91 HOURS



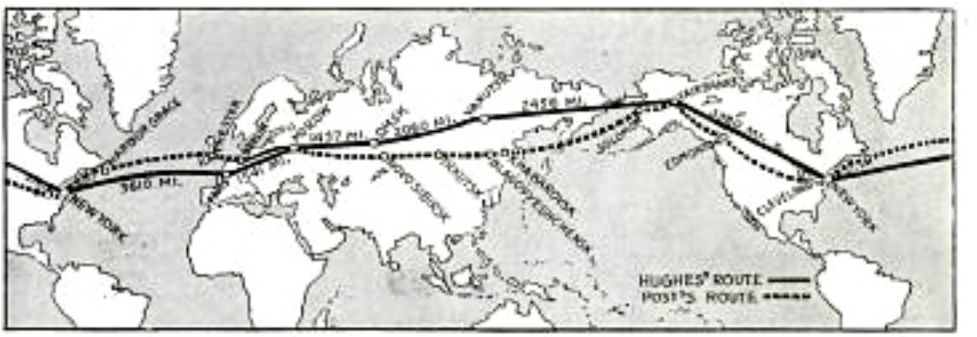
BY FLYING around the world in a little more than ninety-one hours, Howard Hughes and his four companions dramatically demonstrated that airplane speeds virtually have doubled since the epochal flights of Col. Lindbergh and Wiley Post.

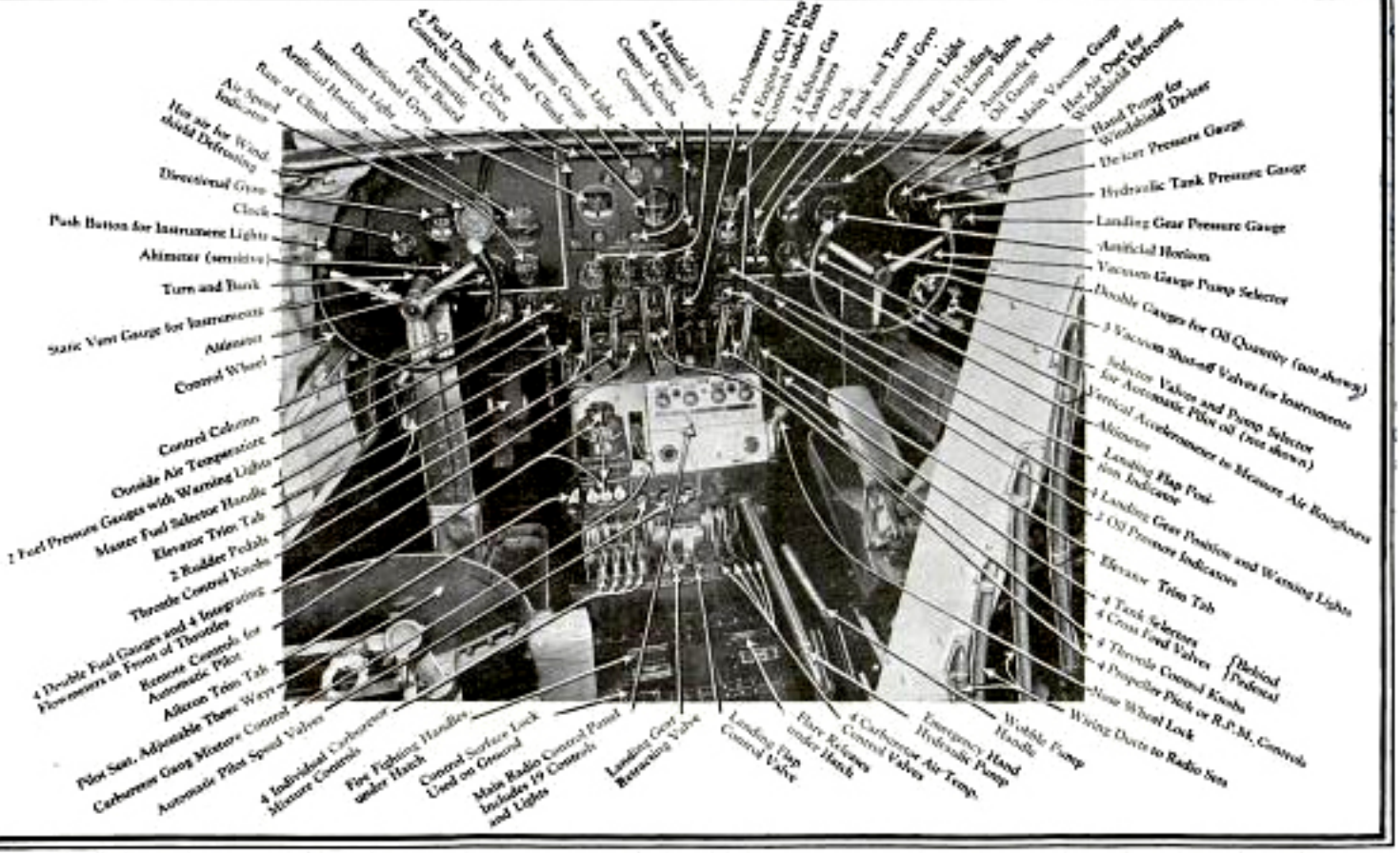
Every stage of this amazing achievement —a trip of approximately 15,000 miles in only seventy-one hours' flying time—reflected the great strides aviation has made in the past few years.

Lindbergh flew from New York to Paris in 1927 in thirty-three and one-half hours. Hughes and his crew covered the same route in half the time. Post, in 1933, circled the globe in seven days and eighteen hours. Following virtually the same course, the Hughes flyers set a new record of three days and nineteen hours, almost four days faster than Post's time.

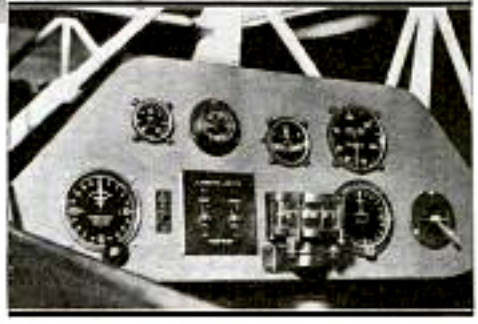
Hughes and companion in cockpit of round-the-world plane, and cross-sectional diagram of ship. Below, routes followed by Post and Hughes, showing approximate distances of each lap

Lindbergh's "Spirit of St. Louis," one of the best of its day, was driven by a 220-horsepower motor and carried 451 gallons of gasoline and twenty gallons of oil on the Paris flight. It had a fixed-pitch propeller,





Cockpit of typical modern airliner. Hughes, on his record breaking flight, was aided by an array of instruments like this, plus what experts said was the most elaborate radio installation ever carried by a long distance flyer



Tuning up motors of Hughes plane at New York. Bottom, instrument panel of Lindbergh's "Spirit of St. Louis." Compare these instruments with the array on facing page

fixed landing gear and was built of spruce and metal tubing covered with cotton fabric. Its top speed was 120 miles an hour.

Hughes' $85,000 "New York World's Fair of 1939" has two 1,100-horsepower engines and carried 1,650 gallons of special aviation gasoline on the trip to Paris. It has adjustable pitch propellers, retractable landing gear and is constructed almost entirely of metal. Its top speed is 260 miles an hour.

Post's "Winnie Mae" had a 500-horsepower engine and a cruising speed of about 145 miles per hour. As for instruments, Lindbergh and Post had almost none compared to the vast array which aided Hughes in piloting his twelve and one-half ton ship.

The "Spirit of St. Louis," for example, had an oil-pressure gauge, oil-temperature gauge, turn-and-bank indicator, an earth inductor compass, air-speed indicator, engine crankshaft speed counter, navigation and landing light switches, altimeter and an ignition switch—that was all. Most of these few instruments, it will be noted, indicated engine performance but were of no value in navigation. Lindbergh did not even have a radio and, once over the Atlantic, depended entirely on a compass and the stars to fix his course.

Now take a look at the Hughes instruments, most of them developed since Lindbergh's flight. First of all, there's an automatic pilot, capable of flying the ship on a predetermined course for hours at a time. The 100 instruments also include oil-pressure and oil-temperature gauges for each engine, cylinder-head temperature gauges for each engine, four fuel-capacity gauges, air-speed indicator, dual manifold pressure gauges, dual artificial horizons, directional gyro compass, engine exhaust-analyzer, two sensitive altimeters, flap-position indicator, wheel-position indicator, revolution counters for each engine, oil-pressure gauges for the ship's hydraulic system, light switches for the entire ship and instrument panel, radio-control switches, tuning grinders, volume rheostats, propeller pitch controls, flap controls, landing gear switches, fuel mixture con-

(Continued to page 141A)

Around the World in 91 Hours

(Continued from page 327)

trols, carburetor heat controls, propeller "full feathering" controls, trim tab controls, fuel-tank selector switches, dual magneto switches, wobble pumps for the hydraulic system and fuel tanks, fuel flowmeters, dual controls for engine cowling cooling gills and throttles.

These instruments, despite their apparent complication, enabled Hughes to know a great deal more about his ship and the atmosphere through which it was flying than Lindbergh or Post could possibly glean from their meager equipment. Knowledge of conditions enabled the Hughes crew to adjust their delicate high-compression powerhouse to its highest performance, thus making faster time.

In addition to all the aviation instruments, the Hughes ship is equipped with the most elaborate radio apparatus ever installed in a non-commercial, long-distance plane. There are three radio transmitters and seven radio receivers by means of which the crew was able to keep in almost constant contact with flight headquarters in New York and radio operators on land and sea.

The radio expert in Hughes' crew took constant radio bearings on shore stations and on ships at sea and, in addition, two navigators constantly took sights upon the stars and calculated their position with this information. By checking against each other to prevent errors, they were able to give the pilot a fresh and highly accurate position report as often as requested.

While the navigators thus kept the ship on a true course, the radio furnished constant weather information which enabled the pilot to select the best flying level. For instance, between Paris and Moscow, Hughes learned by radio that ice was forming at a certain air level and climbed to 17,000 feet to negotiate this area, thus avoiding one of aviation's greatest perils. At that height, the oxygen tanks with which the plane is equipped were brought into use.

Hughes probably received more complete weather information at every stage of his flight than was ever before supplied to any private flyer, thanks both to his elaborate radio facilities and to careful

(Continued to page 143A)

(Continued from page 141A)

advance planning. Before the New York takeoff, Hughes was handed a detailed report of all the weather conditions over his Atlantic route. This report was prepared by William Curtis Rockefeller, young meteorologist of the California Institute of Technology who has given Hughes the "go" signal for most of his record-breaking flights in this country.

While the plane was in the air, nine men in his New York flight headquarters analyzed reports of weather conditions in his path, transmitting this information to Hughes by radio at regular intervals. Weather information was available every thirty minutes while the ship was in the air and detailed weather reports were supplied at every stop, thus enabling the crew to plan their flight possibly hours in advance so they could take advantage of every favorable wind.

Contrast this elaborate weather coverage with the limited information available to Lindbergh and Post. Lindbergh had a report of weather conditions over the Atlantic as they existed before he was in the air. Once in flight, he had no way of knowing what changes he might encounter. Post was forced to rely mostly on whatever data were available wherever he happened to land.

Hughes' plane was the result of many months of experimentation by the country's foremost aeronautical experts. Its base is a high-speed Lockheed monoplane introduced a year ago. After purchasing his ship, he called in technicians to whom he outlined the problems of his proposed flight. As a result, the regular engines were replaced by two specially supercharged motors and other details were altered to compensate for changes in weight distribution, flight characteristics and other features of strength and performance. All the work was done in secret.

From beginning to end, Hughes and his companions left nothing to chance. Science was the invisible pilot sitting at the controls, ever ready to correct any human error or warn of any possible mechanical failure. Without the scientific achievements of the last decade, Hughes in his $85,000 plane would have faced about the same odds as Lindbergh and Post, each of whom staked his life on his own skill as a flyer—and won.