AERONAUTICS-PHOTOGRAPHY

Camera Aids Air Safety

Provides a scientific method of determining the required runway lengths by recording and analyzing take-off and landing characteristics of planes.

➤ A NEW camera system that provides a scientific method of determining the required runway lengths for the safety of air travelers by recording and analyzing take-off and landing characteristics of airplanes has recently been revealed by the Civil Aeronautics Administration.

The system was developed by a number of companies under the direction of the Technical Development Division of the CAA. The equipment includes two cameras, two wind indicator units, two control units and an analyzing projector. In operation, it measures accurately the distances traveled by an airplane along the flight path during a take-off or landing, and the plane's corresponding height, at exactly uniform time intervals.

Where the path of flight follows the center line of the runway, only one camera is required. It is located 1,500 feet to the side of the runway, and opposite the point where the airplane leaves or touches the ground. As the camera follows the movement of the plane, an electrically-controlled shutter snaps the pictures.

Two cameras are used when conditions prevent a precise location of the camera with respect to the path of flight, as in the case of seaplanes or flying boats. The cameras are located up to 2,000 feet apart, and are controlled electrically, so that pictures are taken by both cameras simultaneously. A special type of drafting device is required to project the line of sight from each camera through the imaginary flight paths to a point of intersection.

Each time the shutter clicks, recording the picture of the airplane, a second lens system makes a picture of a small panel which includes instruments for indicating wind velocity and direction, a stop watch, a device for counting the number of frames exposed, and a card on which special information may be written. The direction of the camera at each interval is recorded by photographing an arc marked off in degrees. Both the airplane and the instrument panel appear in the same picture.

An analyzing projector is used to study the pictures. This projector is equipped with a graduated screen which shows the distance traveled by the airplane, and its height above ground when the picture of the airplane is projected on its screen.

The camera was developed by the Bell & Howell Company; the analyzing projector by the W. and L. E. Gurley Company; and the wind indicating unit by the Electrical Speed Indicator Company.

Science News Letter, November 18, 1944

AERONAUTICS

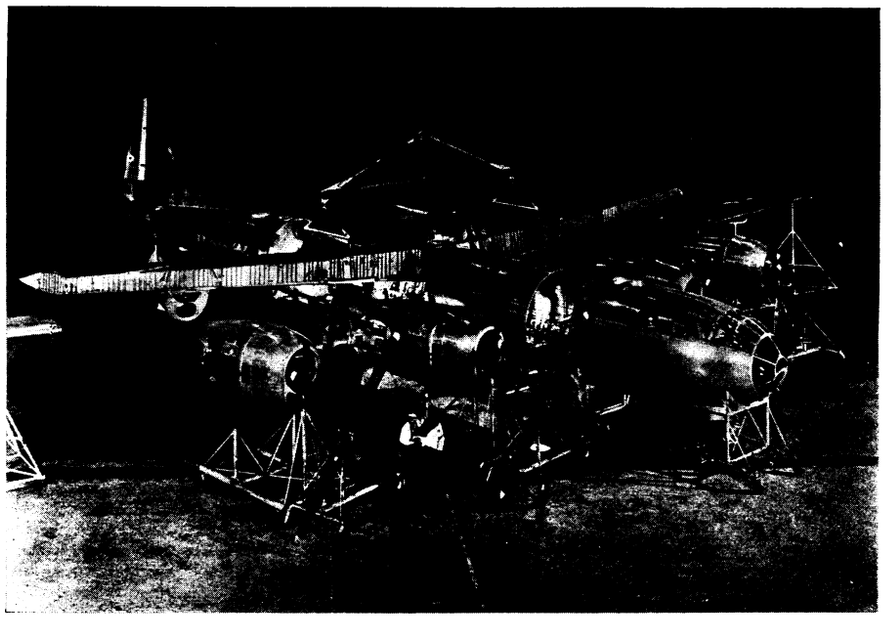
B-29s Are Put Together Like Jigsaw Puzzle

➤ WATCHING final assembly of America's air challenge to the Japanese prong of the Axis, the B-29 Superfortress, is a lot like looking over the shoulders of a number of jigsaw puzzle specialists and watching them put together 40,450 pieces to form a giant airplane. It is an achievement of American engineering and mass production. Only a few completed sections, such as the outboard wing panels, stabilizers, and rudders, come to the Boeing plant in Wichita, Kans., completed from sub-contractors. Sixty-two per cent of every B-29 is fabricated on the spot, on big stationary jigs.

Raw materials flow in a ceaseless stream into the fabrication shops at one end of the big airplane plant. Here parts are stamped out, and moved rapidly on to waiting crews of workers who begin the job of assembling the main sections, the inboard wings, nose, bomb bay, and tail sections. Many of these sections are built standing on end, since it was found that this procedure simplifies the fabrication job. First the framework of ribs is constructed and joined to the bulkheads, and finally the skin is added.

Before the body sections, mounted on wheeled dollies, are moved in on long rows of completed units that lead to the final assembly line, other special equipment is added. This includes instruments, 149 electric motors that control almost every operation performed on the ship, more than ten miles of electric wiring, and a mile and a half of tubing.

When the wings, attached to the bomb bay, known as the inboard wing section, reach the (*Turn to page 327*)



ASSEMBLY OF THE B-29—This "exploded" view of the B-29 Superfortress shows graphically the system of production in which major units of the giant airplane are brought together in the final assembly stages. This makes final assemblage a matter of joining and connecting. Visible in the fuselage section at center of main wings is part of the tunnel used by crew members in passing over bomb bays between fore and aft pressurized cabins of the airplane.