

AERONAUTICS-PHYSICS

Trailing Airspeed Bomb

Measures air pressure at speeds in excess of 300 miles an hour and eliminates one of the foremost dangers of testing planes.

► A NEW airspeed bomb that measures the air pressure at speeds in excess of 300 miles an hour eliminates one of the foremost dangers of testing planes. The new bomb makes it unnecessary to fly at extremely low altitudes over a speed course on the ground in order to check the accuracy of the airspeed instruments.

The bomb was developed by V. J. Schack, William Ehlers, and W. C. Drowne, of the Research Engineering Division of the Consolidated Vultee Aircraft Corporation. Similar devices have been experimented with from time to time. However, most of the previously designed bombs indicated airspeeds of 130 miles an hour or less.

The bomb itself looks like a metal lure used by fishermen. It is 12 inches long, with four rounded stabilizing fins about 3 inches long, and it weighs only 25 pounds. The static pressure head is attached to one end, the fins to the other. Despite its light weight, the bomb shows no tendency to whip or oscillate at high speeds.

The entire assembly has been designed so as to present minimum resistance to a smooth flow of air.

The body of the bomb is made of lead to provide maximum weight in a minimum area. The nose of the bomb is a standard static pressure head. This pressure head, or airspeed indicator, is really a sensitive pressure gauge. It shows the speed at which the plane is moving through the air, and is used by engineers testing the instruments of a new plane to determine whether the built-in pitot-static tube is operating properly.

The pitot tube must be extremely accurate, since every airplane has a certain safe flying range of speed. At the low point on this range, the plane approaches the stalling point. At the high extremity, it approaches a dangerously steep dive. The airspeed for a given engine speed is therefore an index of the fore and aft angle of the plane.

Since it is impossible to obtain true static pressure indications in the turbulent air close to a plane in flight, the new bomb is attached to a cable and lowered by means of a winch to a suitable distance from the plane. Either side hatches or belly hatches of the modern bomber can be used to launch the instrument.

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file information in reconstructing measured drawings or models of ships or planes.

The absence of shadows may indicate fake planes painted on a runway or parking strip, when observed through a stereo viewer.

A knowledge of shadows is important, says the Navy, in camouflage work. Objects in the shadow of other objects are likely to be overlooked by enemy aircraft. The confusing shadow of a clump of palm trees or a hedge is often used to hide important materiel from the eyes of the enemy.

The "shadowgraph," latest training aid for Naval Airmen provides perfect silhouettes of planes and ships for recognition training. Operated on the principle of a Japanese shadow play, the equipment consists of a translucent screen, a light projector and a mirror.

The projector is positioned so that rays strike the mirror and are reflected horizontally to the screen, producing a perfect silhouette of any object placed between the screen and the mirror.

The shadowgraph can be used without darkening the room.

The instructor, standing behind the screen, manipulates the models of planes and ships, pointing out recognition features or calling for identification.

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Swedish private homes are caring for 45,000 children from Finland.

PHYSICS

Identification Aid

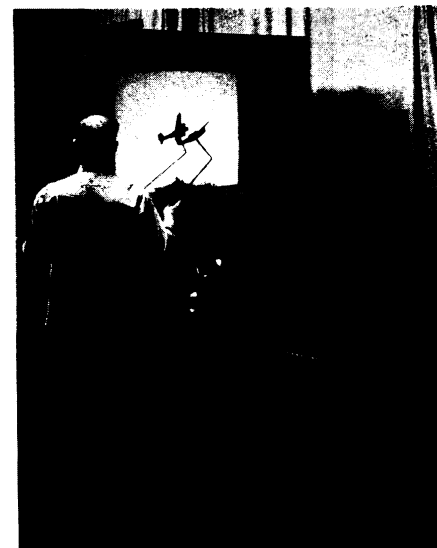
► SHADOWS throw light on identification from the air of many man-made structures, photo interpreters of the U. S. Navy report. Tall, slender objects, such as smoke stacks, water towers, storage tanks, radio and radar antennae frequently would be indistinguishable but for their shadows, say the men who study Navy photo-reconnaissance pictures for information that is of value in planning bombing raids against the Axis.

Shadow lengths give a measure of relative height. Actual height of a building, or a tower, or a boat, can be determined by comparison with the shadow cast by an object whose height is known. However, it is necessary to have the shadows to be compared made under identical conditions. Usually two shadows

in the same picture are used for comparison when the height of the object making one shadow is known or can be determined.

Seen from an airplane, in full sunshine, a natural shadow is almost always the blackest thing on earth. Dummy or faked shadows, made by painting a shadow on the ground to deceive Allied airmen, will look lighter in photographs.

These dummy shadows can also be picked out in photos because they do not change with the sun, and appear the same in all pictures, regardless of the time of day the photographs were taken. A shadow may be a clue to some strategic enemy radio station; or it may be a deciding factor in identifying a ship or a plane. It may provide valuable pro-



PERFECT SILHOUETTE — The clear shadow given by the Shadowgraph, is an aid in training Navy men to identify aircraft. Light from the projector is reflected horizontally from the mirror to the screen.