

AERONAUTICS-METEOROLOGY

All-Weather Flying

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► ALL-WEATHER FLYING, a dream of airmen since the first invention of flying machines, may become a postwar reality as American aviation uses and develops wartime discoveries in the fields of aircraft construction and aerial navigation.

Maj. Gen. Curtis E. LeMay, deputy to the commanding general of the Army Air Forces for research and development, has declared that the AAF now has facilities to maintain flying under all conditions of weather and visibility. To consider the feasibility of all-weather flying and discuss wartime developments in the field, the Army Air Forces invited military and civilian aviation experts to a week-long conference in Washington.

Though much research and inventive genius will be required before commercial airlines can run all-weather schedules, the war's discoveries point to the day when fog, wind, rain and snow will no longer ground flights. To the armed forces, all-weather flying would permit continuous flying operations and end the "scrubbing" of flights, as flyers in the war called their cancelled missions.

Wartime discoveries and inventions, picturesquely labelled with abbreviated names, will serve as the base from which American science can work toward all-weather flying. Radar, loran, shoran, and many other less-publicized instruments and systems that were vital to victory over enemies in war may bring peacetime victories over the forces of nature, the greatest enemy of continuous flight operations.

To demonstrate what can be done under the classic condition, "ceiling zero," the Army Air Forces have landed large planes with blindfolded pilots at the controls. Using a ground-controlled radar system, planes can be "talked down" to perfect landings by a control operator on the airfield.

Radar, most famous of the revolutionary aids to navigation produced during the war, is a radio transmitter and receiver unit sending out radio waves and reflecting them back to indicate surrounding objects for many miles. On his radar screen, the pilot may "see" his surroundings in the most blinding

weather conditions.

Already, the Civil Aeronautics Administration has begun research to develop radar's use in peacetime aviation. Radar both on the ground and in the planes is the prospect for flying in the near future.

Similar to radar is a system for determining geographic position, loran. The loran system sends out radio pulses from fixed ground points that are picked up by receivers on planes. These receivers measure the time of arrival of the pulses from the known transmitting points, permitting the navigator to plot his position on special charts.

Because ground waves have a range only one-fourth as great over land as over water, a refinement in loran was necessary for overland flying operations. This development, SS Loran, uses waves from the loran transmitters that are reflected downward from the upper strata in the atmosphere.

In shoran, a short-range navigational aid used successfully in the bombing of Berlin and other German targets, a plane transmits two signals to ground stations. These signals, transmitted back to the plane, are computed by a special receiver that gives an accurate figure of the distance from the plane to the two stations.

Discoveries during the war relating to high frequency radio have already led to a definite plan for America's postwar airports. The Civil Aeronautics Administration has announced plans for a ground-to-plane, high frequency landing system to be installed at 12 major airports. The new system will permit faster landing schedules on airport runways in overcast weather.

Throat microphones, transmitting the vibrations of the larynx instead of the voice from the mouth, permit accurate communication in a plane under the most noisy conditions and will be a small but important contribution to flying under adverse conditions.

Whether all-weather flying becomes feasible soon or not, radar and related electronic equipment produced during the war are proving valuable in forecasting weather and predicting storms. Reconverted to peacetime use, the war's

developments in aviation mean safer, more continuous flight operation pointed toward all-weather flying in the future.

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ASTRONOMY

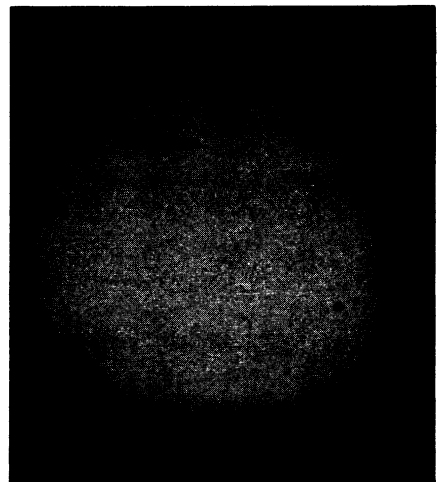
Large Group of Sunspots Now Clearly Visible

► SUDDEN INABILITY either to send or receive shortwave broadcasts, experienced during the last week or two, may be blamed on a group of sunspots large enough to be seen plainly through smoked glasses.

The blackout of shortwave broadcasts was predicted when the group first appeared on the northeastern limb of the sun on Jan. 29. The worse magnetic disturbance occurred between five and six o'clock the morning of Feb. 7, according to radio experts at the National Bureau of Standards. At that time radio transmission began to deteriorate noticeably, followed by a complete blackout of messages from London, Berlin and Moscow.

On top of the magnetic storm was superimposed occasional sporadic disturbances. The exact time of these blackouts could not be predicted, but they occurred only during the hours when the path of the radio waves passed through a daylight zone.

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CLEARLY VISIBLE—The spots in the upper right edge of the sun are large enough to be visible through smoked glasses or fogged camera film. They are the first large group since March, 1940, when seven spots appeared and radio, telephone and teletype communications were snarled for several days. Photograph by U. S. Naval Observatory.