

AIR-SURVEYING ARCTIC CANADA

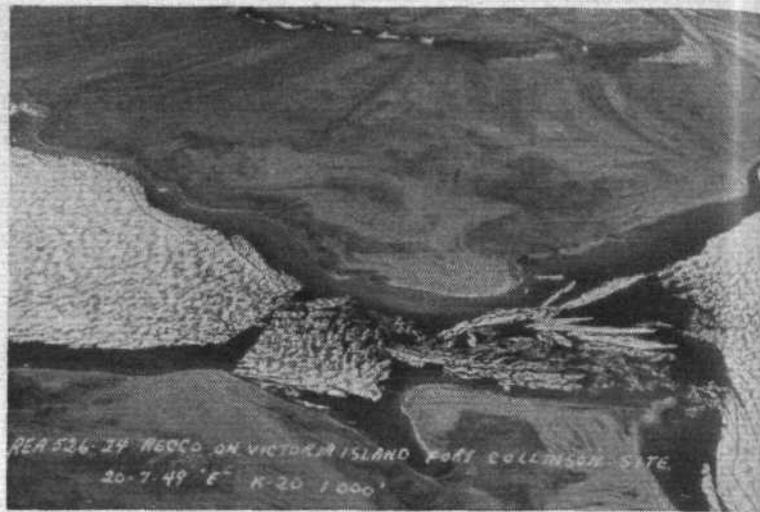
Navigational and Photographic Problems in High Latitudes: The R.C.A.F. at Work

PROBABLY the most formidable air-survey task ever undertaken—the mapping of Northern Canada—is due to be completed this summer. Started on a small scale soon after the First World War, it gained momentum until, in 1948, some 911,000 square miles of territory had been photographed and mapped. In a few weeks' time the work will be resumed, for the R.C.A.F. detachments go into the field as soon as the snow has gone from the southern areas and ice on the lakes has started to break up, normally over by the middle of October.

Writing in *Arctic*, the journal of the Arctic Institute of North America, W/C R. I. Thomas, O.C. No. 22 Photo Wing, R.C.A.F., explains that the preparation for any air-survey operation in the north must begin approximately 18 months ahead. It is necessary to lay in petrol and oil a year ahead so that it is available when photography can start. Once a cache has been assured at a base the detailed planning gets under way during autumn and winter.

The scale of the work calls for flexibility within the organization of the squadrons. This is attained by subdividing each into smaller, self-sufficient formations. The ground crews include engine, airframe, radio, electrical, instrument and safety equipment fitters, in addition to cooks and mess orderlies. Aircrews consist of pilots, navigators, radio officers and camera operators. Each detachment must take with it spares for its aircraft, ground handling and servicing equipment, rations, and personal clothing. The

This local character visited the R.C.A.F. camp at Coppermine to refill his petrol lighter. In the background is a supply-carrying Norseman.



This R.C.A.F. ice-floe picture was taken at Victoria Island in mid-July.

weight of equipment for a Dakota detachment of three aircraft and forty-five personnel is approximately 75,000 lb, which gives some idea of the effort involved.

By 1949 the supply problem had reached such proportions that the original post-war photographic squadron, No. 413, was converted into a transport unit, using four Dakotas, six Cansos and five Norseman aircraft.

Many of the earlier problems encountered have now been eliminated by using long-range aircraft and by the availability of northern bases. The problem that still retains a formidable stature and determines the area that can be covered in a season is the weather. The winter (continues W/C Thomas) is followed closely northward; we work on the heels of the melting snow and ice. In some areas convection cloud forms as the land warms, and it is not unusual to find only a few days during the entire season when photography is possible. To obtain coverage of these areas the R.C.A.F. must be on the spot and ready to fly 10 to 15 hours a day while conditions remain good, a feat made possible by nearly continuous daylight during the summer months.

To reduce the weather-check flying and to allow available aircraft to be concentrated on an area where weather conditions are suitable for photography, a system of control has been worked out with the Meteorological Division. Certain centres are chosen to supply meteorological information to the survey squadrons and, where possible, the Department of Transport assigns an extra forecaster at these centres who passes special forecasts to the detachments. In some cases quite extensive communications channels have had to be set up. In 1948, for instance, when operations were being carried out in Baffin Island, meteorological data from the north-western Arctic was picked up by R.C.A.F. field units from the Department of Transport at Coral Harbour and then passed to Goose Bay through the R.C.A.F. unit at Fort Chimo. Had normal Department of Transport channels been used the delay would have been too great for the data to be of use in the survey operations.

Shoran, a recent introduction in the survey field, came into operation in 1950. It involves using airborne radar equipment in conjunction with ground radar beacons spaced several hundred miles apart, and allows photographs of the area concerned to be positioned accurately.

In addition, it is hoped that Shoran can be used to establish accurate fixes in the north. To do this the photo procedure is reversed. Two ground stations at known positions are used to fix the position of the aircraft, whereas in applying Shoran to survey the aircraft flies at a known height above sea level and measures the "slant" distance to the two ground stations. From the results the distances between the ground stations is calculated. In 1949 measurement was begun of a large network of Shoran stations stretching from the Winnipeg area to Fort Vermilion in Alberta, a distance of approximately 1,200 miles. This programme was completed in 1950, and the soundness of the method proved. Accuracy in the order of 1/58,000 has been achieved.

Tri-camera photography is undertaken exclusively by No.