

Radio Aids to Aeronautical Navigation.—Radio aids to air navigation are provided from coast to coast and from the Canada-United States border to the Arctic along and off the airways, and are used by many Canadian and foreign air carriers flying over Canadian territory. Trained engineers and technicians are assigned to six District Offices located at Vancouver, B.C., Edmonton, Alta., Winnipeg, Man., Toronto, Ont., Montreal, Que., and Moncton, N.B., in order that facilities may be constructed and efficiently operated.

Radio Ranges.—The principal radio aid to air navigation provided by the Department of Transport is the low frequency radio range station, located approximately every hundred miles along airways. It provides specific track guidance to pilots by means of audible signals and the signals may also be used for the purpose of obtaining direction finding bearings. In addition radiotelephone communications are provided between ground and aircraft, by which means pilots may obtain weather data, air traffic control instructions and other information concerning the safety of flights.

There are now being constructed a number of very high frequency omni-directional ranges (VOR). Unlike the existing radio range stations this type of facility does not limit the aircraft using the station to one of four distinct courses, but enables the pilot to select at will his desired course. Construction is advancing on facilities to form a six-station omni-range airway between Montreal, Que., and Windsor, Ont., with standard 200 watt installations located at Montreal, Ottawa, Stirling, Toronto, London and Windsor. Work has also started on six additional stations for a high altitude airway from Toronto, Ont., to Winnipeg, Man., and on one isolated station at Gander, Nfld.

Beacons, Markers, etc.—Aeronautical radiobeacon stations provide radio signals with which pilots may use their direction finding equipment to obtain relative directional bearings. Fan markers, operating on very high frequencies, are usually placed on an airway so as to inform the pilot when he may safely lose altitude after passing high terrain or to indicate accurately the distance from an airport. Station location markers are similar to fan markers except that the signal radiated is such that aircraft may receive the same indication irrespective of the direction of flight. They are installed at the same location as a radio range to enable a pilot to determine when he is exactly over the station, thus obtaining definite indication of position. Station location markers are installed at most radio range sites.

Instrument Landing Systems.—Instrument landing systems provide radio signals which, when received by special radio equipment aboard aircraft, permit pilots to approach airports for landing during periods of very low visibility. An installation normally consists of a localizer transmitter providing lateral guidance to the runway, a glide path transmitter for slope guidance to the approach end of the runway, two marker transmitters giving distance indications from the runway and a low power radiobeacon (compass locator) to assist in holding procedures and lining up on the localizer course. The localizer and marker transmitters operate on very high frequencies, the glide path on ultra high frequencies and the compass locators on low and medium frequencies. Twenty-six instrument landing systems are in operation, a new installation having been commissioned during 1955 at Saint John, N.B.

Aeronautical Communications Stations.—To assist in providing communication between aircraft and ground, radio stations are located at strategic points across the country, including the Arctic. These stations, operating for the most part on high frequencies, provide communication to both domestic and international air carriers. The international communications stations form a major contribution on the part of Canada to international aviation. They may be grouped as follows: (1) communication for Meteorological Services; (2) communication for the Air Traffic Control Services; and (3) communication, for the benefit of the airline operating agencies, with their aircraft and between their despatch offices.