

*Direction Finding Service.*—Coast radio direction finding stations, operated on the Atlantic Coast and on Hudson Bay and Strait, enable ships to obtain a line of bearing from the station. No charge is made for this service.

A chain of automatic radiobeacon stations is also maintained to provide a navigational aid to mariners by transmitting signals on which bearings may be taken by ships. These stations are arranged, where possible, in groups of three, transmitting on a common frequency but in proper time sequence so as to avoid interfering with one another. A navigator may thus obtain three bearings within three consecutive minutes and fix his location. A number of radiobeacons are synchronized with fog alarms at the same point, for distance finding in foggy weather. Ships may also request the transmission of signals from the coast stations for direction finding purposes.

*Loran Stations.*—Loran is a long-range radio aid to marine and air navigation which provides accurate fixes at distances up to 600 miles by day and 1,500 miles by night. Two Loran stations operate in Nova Scotia, three in Newfoundland and one on the West Coast. These stations, in conjunction with Loran stations of the United States Coast Guard, give service to ships and aircraft plying the North Atlantic and Pacific Oceans.

*Radar.*—It has become general practice to equip merchant ships with radar, a valuable aid to marine navigation, and many important buoys are fitted with radar reflectors to increase their radar visibility. Two shore-based radar installations are in operation—one at Camperdown near the mouth of Halifax Harbour and the other on the Lion's Gate Bridge across the entrance to Vancouver Harbour.

*Miscellaneous Services.*—Lighthouses, particularly at locations where they would otherwise be completely cut off from summoning help in case of illness, are provided with low-power transceivers for use in emergencies. Lighthouse radiophone stations are organized into groups working into a control station.

Ships at sea may obtain medical advice from any coast station. The messages are delivered to the port medical officer of the Department of National Health and Welfare and replies are transmitted to the ship free of charge.

Radio and radar equipment used aboard vessels of the federal marine, pilotage and canal services, on vessels operated by the Department of Fisheries, the Department of Mines and Technical Surveys and the Department of National Revenue and on Canadian National Railway ferries is maintained by the Telecommunications Branch of the Department of Transport.

*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., to carry out the construction and efficient operation of facilities.

*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 his desired course. 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 is in operation. Work is progressing on six additional stations for a high-altitude airway from Toronto, Ont., to Winnipeg, Man., and on one isolated station at Gander, Nfld.