finders to calibrate their equipment. These radiobeacons operate for a six-hour period on the advertised frequency. Periodically operating radiobeacons are located in areas where there is a limited marine requirement. They normally transmit their characteristic signal continuously for one minute in every 10, using continuous carrier and tone-keyed modulation. This type of automatic radiobeacon is designed to operate unattended for long periods of time in areas that are isolated or inaccessible for part of the year.

Loran is a long-range radio aid to marine and air navigation providing accurate fixes at distances up to 750 miles by day and 1,500 miles by night. Two Loran stations operate in Nova Scotia, three in Newfoundland and two 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 routes. Decca is a short-range radio aid to navigation providing accurate fixes at distances up to 250 miles. Four chains of Decca stations are in operation — the Newfoundland, the Nova Scotia, the Anticosti and the Cabot Strait — giving service to ships off Newfoundland and Nova Scotia and in the St. Lawrence River and Gulf.

It has become general practice to equip merchant ships with radar and important buoys are fitted with radar reflectors to increase their radar visibility. Ten radar responder beacons are in year-round operation on the east coast, two on the west coast, and five in the St. Lawrence River; nine in the western Arctic and five in the Great Lakes are in operation during the navigation season. Low-power transceivers are provided for use in emergencies at lighthouses, particularly at locations that would otherwise be completely cut off from assistance in case of illness.

Radio aids to air navigation are provided by the Ministry of Transport from coast to coast and from the United States border to the Arctic regions for use by Canadian aircraft and foreign air carriers flying over Canadian territory.

Low-frequency radio aids operating on the frequency band 200-415 kHz are generally located within a distance of 50 to 100 nautical miles of each other to form the low-frequency airways system. A few are located "off airways" in remote regions and a number of low-power radiobeacons serve major airports as terminal and landing aids. The Ministry of Transport operates 336 en route, low-frequency aids (11 of which are the older type radio range class) and 60 low-power terminal radiobeacons. These facilities are used primarily in association with airborne direction-finding equipment. Voice channels on a number of low-frequency aids are also used for aircraft communications and weather broadcast purposes.

Operating on the higher frequency bands VHF (very high frequency) and UHF (ultra high frequency), the Ministry of Transport operates 67 VHF omnidirectional ranges (VOR), 70 instrument landing systems (ILS) and 32 tactical air navigation systems (TACAN). At 30 locations the VOR and TACAN station are co-located and the complete station is called a VORTAC.

The VOR and VORTAC stations form the VHF airways system which closely parallels the older low-frequency airways system. Additional stations are being installed. Use of the VOR permits the pilot to select any desired course to fly to the station and, in the case of a VORTAC, additional information is provided which is a readout of the distance of the aircraft from the station.

Instrument landing systems provide radio signals which permit aircraft landings during periods of low visibility. Radio transmitters provide lateral and slope guidance to the approach end of the runway and also provide an indication of the distance to the runway threshold.

For air traffic control purposes, there are three main classes of radar in operation at Canadian airports consisting of 15 airport and airways surveillance radars with a range of 150 nautical miles, eight airport surveillance radars with a range of 50 nautical miles, and eight precision approach radars, which are short-range radars used for landing at major airports.

Radiotelephone communications are provided by 113 ground stations called Aeradio Stations, from which pilots may obtain weather data, air traffic control instructions and other information concerning flight safety. These stations operate for the most part on the VHF band but in the North and on international routes HF is used to provide the necessary long-range coverage. Thirteen of the 113 stations engage in international communications services for Canadian and foreign air carriers. All these ground stations are connected to a fixed teletype network of more than 48,000 circuit miles to meet aeronautical communications needs.