

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.

Airport and airway surveillance radars (150 nautical-mile) are in operation at nine airports for air traffic control purposes. Of the six additional installations planned, five are expected to be operating before the end of 1960. A 50-mile-range surveillance radar at Gander forms part of a complete ground-controlled approach facility.

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. Thirty-one instrument landing systems are in operation.

To assist in providing communication between aircraft and ground, *aeronautical radio communications stations* are located at strategic points across the country, including the Arctic. These stations, operating for the most part on high frequencies, provide communication with both domestic and international air carriers. The international communications stations form a major contribution on the part of Canada to international aviation. Their functions 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.

Subsection 7.—Other Government, Miscellaneous and Commercial Radio Communication Services

Radio services have been established by all provincial governments, mainly for police, highway and forestry protection purposes.

Municipal government departments have steadily increased their use of radio to facilitate operations particularly as a medium of communication with vehicles—police, fire, engineering, hydro, etc. In addition, the trend toward expansion in the employment of radio for urban mobile communication has shown no signs of abating. Such services as taxi, heavy construction, ready-mix concrete, oil pipeline construction and operation, veterinarian and rural medical have participated extensively in this increase.

Public utilities, power companies, provincial power commissions, oil exploration and mineral development organizations have considerably expanded their use of radio in both urban mobile and point-to-point radio fields.

The member companies of the Telephone Association of Canada have established and are operating coast-to-coast microwave facilities to augment existing inter-city communication services and to provide television network service. This system has a number of trans-border (Canada-United States) inter-connections and is being continually modified and extended to provide better service. The railway companies also operate a number of large microwave radio systems to facilitate their inter-city communication services.

The Telephone Association members, independent telephone companies and the railways are increasingly extending communication service, by means of radio, to northern areas where such service was previously unavailable.

In addition, the telephone companies provide an extension of land telephone service, by radio, to suitably equipped vehicles. This service is available in all major cities in Canada and along many of the nation's arterial highways. Service of a similar nature is also provided by radio to land stations of subscribers in areas not served by normal wire telephone facilities. Restricted common-carrier mobile radio service (this service to