

of supporting is also a very important factor. In 1937 few aircraft weighed over 20,000 lbs., whereas today many aircraft weight 120,000 lbs. and even 135,000 lbs.; and the jet aircraft I have just mentioned will probably weigh as much as 285,000 lbs.

Obviously, our responsibilities do not end when we have built runways suitable for the aircraft which are to use them. We must also install at our airports and on our airways the electronic equipment necessary to facilitate the navigation of aircraft in flight and to assure their safety at all times. You may judge the magnitude of this responsibility when I tell you that we have in Canada 18,000 miles of airways, and that 16,000 miles are provided with navigation aids. At the present time most of these airways are equipped with low frequency radio ranges, which guide aircraft along the airways between one airport and another. Though for years these radio ranges were the best equipment available, not very long ago someone invented a more modern radio range giving better service and called the visual omni range, or VOR. VOR operates on a high frequency and, whether he is on the airway or not, the pilot may take a bearing on the station and locate his position anywhere within its range. Moreover, instead of listening continually on earphones to an audible signal, the pilot can see the VOR signal on his instrument panel and verify whether or not he is in fact flying over the route which he wishes to follow.

It was necessary, of course, for us to adopt this new equipment and to undertake its installation. We have completed the installation on the airway between Montreal and Windsor and are in process of installing it on the airway between Toronto and Winnipeg. As the equipment becomes available, we shall continue with the installation on the other segments of the trans-Canada airway. But the point I want to emphasize is that these VOR radio ranges have to be installed about 40 miles apart, and cost, installed, about \$50,000 each; so you see that this single item, the existence of which is unknown to most air travellers, represents a pretty substantial expenditure.

To permit the use of airports at night, we are obliged to provide lighting systems and to facilitate their use in bad weather we have to install instrument landing systems, or ground control approach. These installations are very expensive but, of course, they increase greatly the utility and efficiency of the airport and add an important measure of security.

The movement of aircraft over the airways is directed by what is called air traffic control. The control centre is at all times in communication by radio with the pilot so that the controller may estimate the position of the aircraft from time to time as it flies along the airway. With the increase in the number of aircraft on the airways and in their speed, it has become necessary to know much more precisely the position of aircraft in flight between specific points. You may readily appreciate the difficulty of working only on estimates and the