

Radio as an Aid to Aerial Navigation

IT is scarcely five years since commercial aviation emerged. To-day it is becoming a definite part of our transport system both for light freight such as mail and express and for passengers. Already over 5000 'planes are daily in the air on commercial business. But before there can be commercial success there must be two certainties, safety and regularity of service. The radio now assures us a large measure of both.

To be able to fly with certainty by night, to pilot through or avoid fog and storm can in large measure be made certainties if constant communication can be maintained between the ground and the 'plane—and radio provides the missing link for just that communication. In fact, the development of radio applied to aviation assures just that margin of safety and regularity which gives the 'plane a definite position as a regular and safe means of transportation. It thus makes commercial application of aviation a certainty. Prior to the application of radio communication with the 'planes, there was no certainty of regular service; there was great danger from hazards of storm, fog and snow.

There are, generally speaking, two sorts of flying going on to-day—one is for pleasure and sport, while the other is commercial transportation. Pleasure flying, like picnicking, can be put off if it is a bad day, but the regular scheduled operations of the air transport companies must go on day in and day out. Both kinds of flying will be aided by radio, but it is commercial transportation that is becoming vitally dependent upon it.

The pilot of a regularly scheduled 'plane must know two things. First, he must be able to keep track of constantly changing weather conditions that are beyond his range of vision, and sec-

THOUGH the advisability of carrying radio equipment in aeroplanes engaged in long-distance "stunt" flights has often been questioned, it has been found that commercial aviation is rapidly becoming dependent upon radio communication as a means of securing navigational assistance. This is supplied by the use of direction-finding receivers which are actuated by signals received from automatic radio beacons erected en route. In view of the greatly increased interest recently manifested in aviation by the New Zealand public, the following outline of the important part radio plays in materially reducing the risks usually associated with aerial travel should prove interesting.

and, he must be able to locate his exact position, even though the ground may not be visible. Furthermore, he must be able to get this information or any other aid he may need at any moment he may desire it.

This, briefly, is the task that radio must perform in aviation. If the pilot is to receive weather information and be able to talk with those on the ground, there must be a series of radio stations along the airways, and if these stations are to be useful they must have a complete weather observing system to draw upon. It is not, therefore, merely a matter of putting a radio set on each 'plane, but a large and complicated organisation of ground radio stations, weather observers, and airports must be tied together with some quick and dependable method of communication and made to function together smoothly as a unit.

MUCH of this information and service should be available to all flyers, whether they are private individuals or large transport companies. The Government has undertaken to provide the service, and it has been a tremendous help to all branches of aviation. A series of 2000-watt broadcasting stations using wave-lengths of about 1000 metres have been erected along the principal airways in America, each located two or three hundred miles apart. Once an hour, or more often, they send out weather reports collected along the

route, together with landing conditions at each of the airports in their vicinity. This service is free for anyone who cares to tune in for it, and although intended primarily for aviation, many other people will undoubtedly use it.

THE large transport companies who maintain daily schedules over their routes must be able to carry on two-way conversations with their 'planes wherever they are in flight. Obviously the Government stations which broadcast weather reports cannot be expected to keep in contact with the large number of commercial 'planes that will soon be flying near them.

The transport operators have therefore found it necessary to establish their own ground stations, along the particular routes which they fly. By pooling their equipment at places where they overlap, and placing as many routes as possible on the same channel, the best possible use will be made of the limited number of wave-lengths available.

We can confidently expect to see, within the next year, a majority of the commercial 'planes equipped with two-way radio telephones. Every few minutes they will call their own stations on the ground, and reassure them as to their position, probable time of arrival at the next stop, gasoline supply, or to inquire for special weather reports or other information when necessary.

In an emergency the passengers may be able to talk with any part of the country by a combination of radio and land telephone wires. The pilots will be able to pass on to each other the latest information regarding the weather they are flying through and thereby check and supplement the observations from the ground.

THIS fulfils the pilot's first requirement in regard to the weather information. To meet the second need and enable the pilot to locate himself, still another radio device has been perfected. This is the radio beacon. These

stations are located about two or three hundred miles apart, and are located at the principal airports along the route. They send out a directional beam in such a way that the pilot, using the same receiver with which he picks up the weather broadcasts, can tell whether he is exactly on his course, or to the right or left of it.

On the right of the course the transmitter sends out a certain repetition of dots and dashes, while on the left it sends out a different combination. If an aeroplane is exactly on its course the two signals blend into one long dash, and the pilot knows that he is still on his route, although he may be able to see nothing. As soon as he gets slightly to one side or the other, the signal tells him which way to turn.

AT important points along the airways small marker beacons with a range of only five miles have been installed. They are like invisible bell buoys leading into a harbour, and from them a pilot is able to judge how far he has progressed along his course.

TO many people these facts may seem fantastic, but to those in the aviation business it is an assured fact. There are undoubtedly other developments yet to come. Within a short time Governments will require radio on commercial aeroplanes just as many now require all ocean liners to be equipped before they can leave port. In fact, radio will be even more important in aviation than it is in shipping, because a boat, rarely travelling at over twenty miles an hour, can ride out a storm or anchor off port almost indefinitely, while an aeroplane must travel at over a hundred miles an hour, and must find its airport immediately.

It is just 25 years since the Wright brothers made their first air flight, and at this same time Marconi was transmitting his first feeble signals across the Atlantic by radio. Few people would have imagined that a combination of these two great discoveries would give to us a great arm of commercial transportation—aviation.

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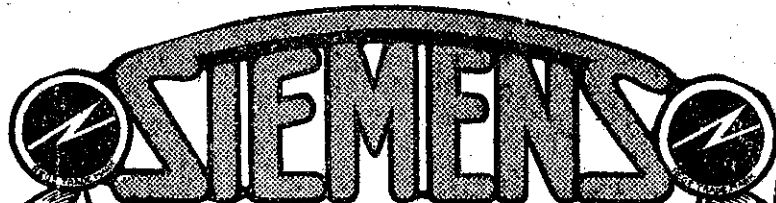
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