

electrons in the ionosphere changes daily with the time of day and latitude. This is done by sending sweeping radio signals from 1.6 to 11.5 megacycles. The swept-frequency system was selected in preference to the simpler fixed-frequency system because of the extreme complexity of the ionosphere above Canada.

The second experiment seeks to determine the electron density at the satellite altitude from a measurement of cosmic noise. The third experiment records the very-low-frequency radio "whistler" noise received in outer space and produced by lightning flashes and other phenomena near the earth's surface.

A fourth experiment carried out by six detectors placed in the satellite by the Canadian National Research Council seeks to measure primary cosmic-ray particles outside the earth's atmosphere, including electrons, protons and alpha particles.

Scientific data collected by the satellite is being transmitted by radio signals to 13 ground stations round the world. Three telemetry stations have been built in Canada by the Defence Research Board at Resolute Bay, Prince Albert and Ottawa. Data collected by the telemetry stations is being recorded on magnetic tape in seven channels. The tapes are forwarded to the DRTE for reduction and analysis. Comparisons of the results of the sounding of the top levels of the ionosphere from above by the satellite with the results of the sounding of the lower levels of the ionosphere by ground-based equipment is expected to help to establish the relations sought by scientists. The scientific information acquired concerning the ionosphere will be made freely available to scientists of all nations.

### **Launching**

The "Alouette" was launched by NASA from the Pacific Missile Range near Vandenberg Air Force Base in California. The spacecraft was lifted into orbit on a "Thor" first-stage and "Agena-B" second-stage rocket. The launching on September 28 was attended by a party of Canadian officials headed by Dr. A. H. Zimmerman, Chairman of the Defence Research Board.

### **Report to Parliament**

In reporting the launching of the "Alouette" to Parliament on October 1, Mr. D. S. Harkness, the Minister of National Defence, outlined the four experiments being conducted. He said:

... If these experiments are completely successful (and at the moment we have every reason to believe that they will be), they will have valuable practical application to the technology of long-range telecommunications both for civil and defence purposes.

... The Government and industrial scientists and engineers who have contributed to this project have acquired new experience, knowledge and skills which will improve Canada's international stature and industrial competitive position in an expanding technological field. . . .

This has been an outstanding Canadian achievement, which could not have been successful without the close co-operation and support of officials in the United States, industry here in Canada and, in particular, without the earnest endeavours of all who participated in this project within the Defence Research Board.