

Balloons, rockets and satellites

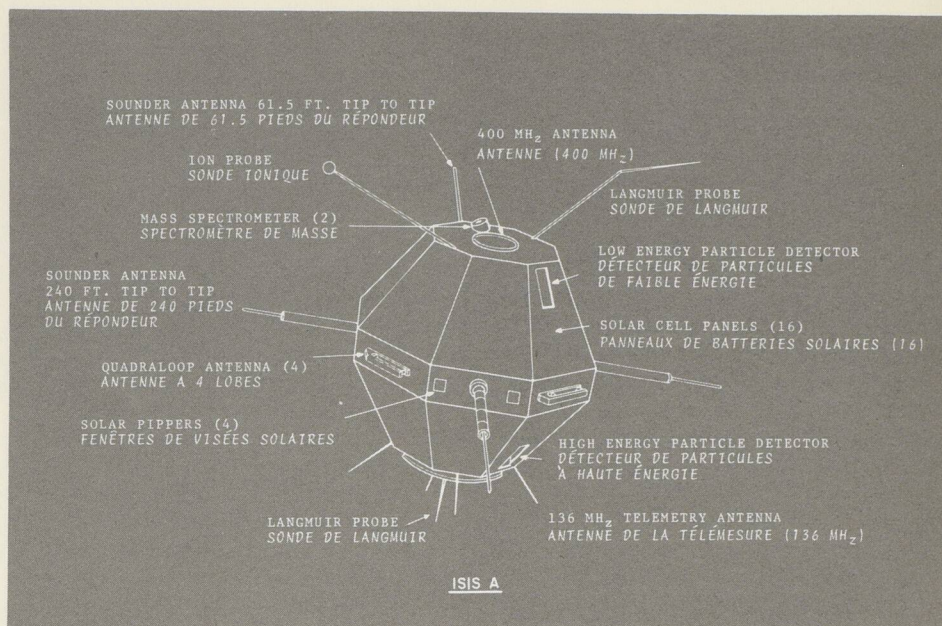
Study earth's atmosphere

Man has only a limited knowledge of the earth's environment. He knows most about the troposphere which contains about three-quarters of the mass of the atmosphere and extends to an altitude of from five to 10 miles. Less is known about the stratosphere, located 35 to 40 miles above the earth, and the ionosphere which lies above the stratosphere and extends to an altitude of some 600 miles. Even less is known about the magnetosphere which extends from the ionosphere out to about 40,000 miles and is the region in which the earth's magnetic field dominates the motion of electrically charged particles.

The National Research Council of Canada's Associate Committee on Space Research provides a national forum where scientists from universities, industry and government laboratories discuss matters of common interest in the field of space research. The term "space research" covers a broad spectrum of activities in which there is at present much international interest, both scientific and technological. Canadian scientists have participated actively in a number of areas in this highly competitive field and considerable success has been achieved.

The Committee has been particularly involved in promoting and coordinating space research using rockets and large balloons. Scientists in ten universities and two government agencies subsidized by NRC grants are carrying out space experiments in a variety of subjects, including X-ray astronomy, micrometeorite detection, studies of the composition and properties of the upper atmosphere and studies of the many effects, ranging from the Van Allen radiation belts to magnetic storms, that result from the bombardment of the earth by various kinds of radiation from the sun. Many of these studies involve co-operative experiments with university and government scientists participating equally and sharing common facilities. Development of techniques and hardware is conducted in the universities, industry and in government laboratories.

Scientists wishing to conduct a rocket or balloon experiment submit an experiment proposal to the Scientific Evaluation Panel of the Associate Committee on Space Research. The Panel performs an impartial evaluation



of the proposal and either accepts or rejects it. The acceptable experiments are then integrated into the over-all program and the rocket, the payload engineering, and the launch are funded through NRC's Space Research Facilities Branch, while the experimental package is supplied by the scientists.

When ISIS B, Canada's fourth satellite, is launched in 1970, photometers developed by two Canadian universities with NRC grants, will be aboard. An NRC grant of \$175,000 to the University of Calgary for 1969-70, has assisted research work on two flight models of an auroral scanning photometer. This experiment is designed to transmit data in a form which can be converted directly into pictures on an oscilloscope, providing a TV-type display of the aurora at specific wavelengths of light. During 1967-68 and 1968-69 the University received a total of \$250,000 from the Council for this project.

A similar grant of \$175,000 to the University of Saskatchewan for 1969-70, and previous grants of \$150,000 during 1967-68 and 1968-69, have aided work on an oxygen red line photometer. The experiment is designed to detect nightglow, twilight-glow, dayglow, aurora, mid-latitude arcs and tropical arcs. Data obtained from these and other experiments should lead to interpretation of certain hitherto unexplained phenomena. —>

Schematic of ISIS A Satellite. It has a diameter of 50 inches, a height of 41 inches and weighs 525 pounds.

Schéma du satellite ISIS A, de 50 pouces de diamètre (1.27m), de 41 pouces de hauteur (1.04m) et pesant 525 livres (238 kg.).