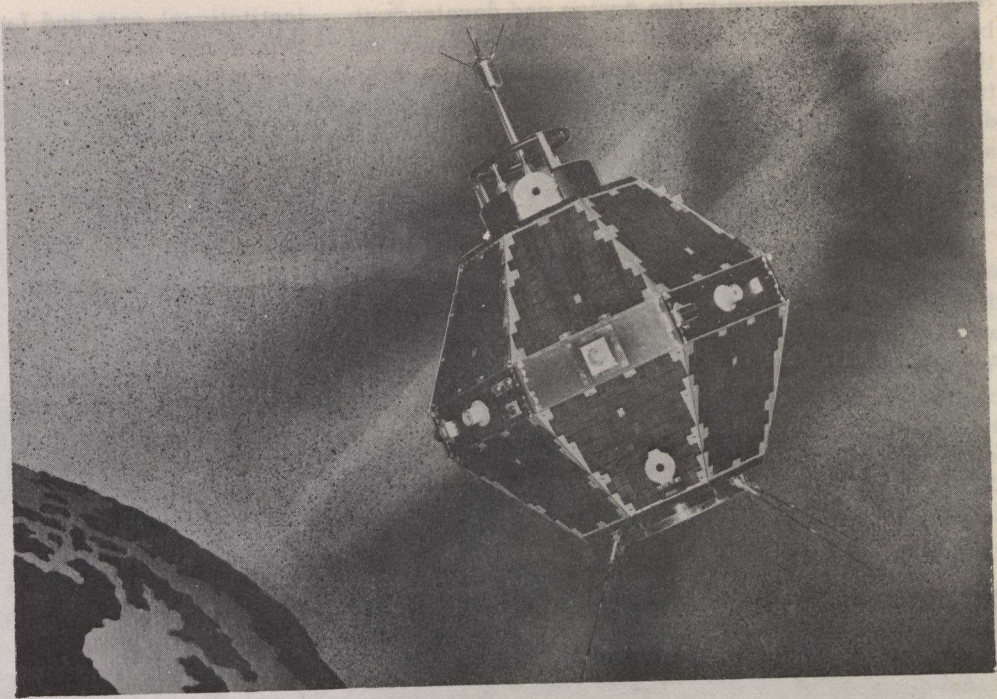


CANADA'S
FOURTH
SATELLITE
ALOFT



Canada's ISIS-II satellite

The Minister of Communications, Mr. Eric Kierans, and a Canadian delegation of Parliamentarians and senior civil servants, were present at the launching of Canada's fourth satellite, *ISIS-II*, on March 31. The 582-pound satellite, designed and built in Canada was launched from the Western Test Range of the National Aeronautical and Space Administration (NASA) in California.

ISIS-II, the most advanced spacecraft yet developed for studying the ionosphere, is the third satellite in a joint program of the Canadian Department of Communications and the NASA of the United States. The total program, which envisaged up to four Canadian-built satellites, was begun by the Defence Research Board but was later transferred to the Department of Communications when it was created in 1969. The experiments in the satellites, and the orbits in which they operate, have been planned to complement one another; they will be compared in detail.

ISIS II carries 12 experiments to investigate the ionosphere – more than any flown by a single satellite in this program. Eight of the experiments were provided by the DOC's Communications Research Centre, the National Research Council and the Universities of Calgary, Western Ontario and York. The other four experiments were provided by the NASA Goddard Space Flight Centre and the University of Texas.

The Canadian satellite was launched by a three-stage, thrust-augmented *Delta* rocket into a circular, near-polar orbit 1,400 kilometers above the earth, at an inclination of 88.7 degrees, with a period of 114 minutes. The three earlier Canadian satellites, *Alouette I* and *Alouette II* and *ISIS I*, were placed in

near-polar orbits from the same launching-site and are still operating. *Alouette I*, launched in 1962, is the oldest operational satellite orbiting the earth.

The NASA world-wide STADAN tracking network will track *ISIS-II* as it has the earlier satellites. This support will be augmented by stations operated by Canada, Britain, France, Norway, Japan, India, Australia and New Zealand. Data obtained from the satellites is also related to ground-based scientific research carried on by these nations throughout the world.

NATURE OF THE IONOSPHERE

The ionized atmosphere extends upward from about 50 miles above the earth and is created largely by solar ultra-violet radiation that strikes the neutral air-molecule, causing them to split into electrically-charged ions and electrons. These charged particles form an electrical conductor capable of reflecting radiowaves, making possible radio-transmissions over long distances on the earth's surface. Canada is particularly dependent on the ionospheric reflection for short-wave radio communications in its northern regions. The electron density varies in altitude and amount of ionization with the time of day, the degree of solar activity, the season of the year and geographical location.

BENEFITS TO INDUSTRY

Apart from the immense scientific value of the *Alouette* and *ISIS* satellites, the Canadian program has been responsible for developing within the Canadian industry a base of knowledge in the design and manufacture of spacecraft and components.

Industrial participation in the construction of