

CANADA'S THIRD SATELLITE

As *Alouette I*, the first satellite built by the Defence Research Board of Canada, celebrated its sixth birthday on September 29, the larger and more complex *ISIS "A"*, another joint project of DRB and the U.S. National Aeronautics and Space Administration reached the half-way mark in its pre-launch tests. This third Canadian satellite, which will probe the ionosphere, is scheduled for launching at California's Western Test Range (WTR) about mid-December aboard a NASA rocket.

RIGOROUS TESTING

Fitted with all its onboard components, it is being subjected to a series of rigorous tests for 12 weeks to check spacecraft characteristics and performance under simulated launch and orbital conditions.

The present series of tests began on August 12 and will continue until mid-November when the spacecraft is shipped to WTR. The series includes compatibility-tests designed to ensure that NASA's Goddard Space Tracking and Data Acquisition Network will be able to track and receive data from the satellite. Tests, such as those of mass and magnetic measurements, vibration and thermal tests, check spacecraft characteristics and performance under simulated launch and orbital conditions.

Heavier than DRB's predecessor satellites *Alouettes I* and *II*, *ISIS "A"* will weigh some 525 pounds and is considered a medium-sized research spacecraft. Like its predecessors, it is spheroid in shape. Its outside surface is covered with more than 11,000 solar cells to power the batteries inside.

ISIS "A" is fitted with two extendible antennae, 240 and 75 feet long, to sound or probe the upper levels of the ionosphere. Four telemetry antennae project from the base of the craft to accept commands from the ground and to transmit data gathered by the satellite to ground-stations. Quadraloop antennae are mounted round the satellite's equator to radiate beacon transmissions, and two antenna-like booms

support probes for use in several of the onboard experiments.

The prime contractor for design and construction is the RCA Victor Company Limited. Satellite specialists from DRB's Defence Research Telecommunications Establishment (DRTE), Ottawa, monitored the industrial phases of the development and are directing the current tests in the U.S.A.

MORE COMPLEX THAN PREDECESSORS

The satellite's 11 experiments and expanded facilities have created power requirements considerably greater than those employed by *Alouettes I* and *II* which are carrying out four and five experiments each. A new feature, designed for the *ISIS* spacecraft series, is a spin- and attitude-control system to stabilize spin action in space and, also, to control the attitude of the craft relative to the sun and the earth.

ISIS "A" will be carried into orbit from the Western Test Range in California on an improved *Thor-Delta* rocket system, 92-feet high, provided by NASA. The vehicle will be about six feet longer than the *Thor-Agena* rockets that carried the *Alouettes I* and *II* so successfully into orbit around earth. The satellite will be the third in the series of five DRB and NASA spacecraft designed for ionospheric research by the Board's Ottawa telecommunications laboratory.

The letters "ISIS" refer to the joint DRB and U.S. National Aeronautics and Space Administration programme of International Satellites for Ionospheric Studies. Two more spacecraft in the series, the "B" and "C", are planned for further associated experiments to expand understanding of the outer atmosphere (magnetosphere), and particularly of the ionosphere, which affects radio communications.

Movement of the flight model from the prime contractor's plant in Montreal to Goddard Space Flight Centre was carried out with the help of the Canadian Armed Forces.

MAIL-CONTAINER SERVICE

The largest mail-container operation in the history of the Canada Post Office was inaugurated on October 1 between North Sydney, Nova Scotia and Newfoundland.

The new service, which is receiving the co-operation of Canadian National Railways, speeds up the transportation of mail by the use of aluminum containers, 20 feet long, from the North Sydney postal terminal, across the Cabot Strait, to Port-aux-Basques. CN then delivers the mail by truck over the Trans-Canada Highway to five key distributing-points in Newfoundland.

Six containers a day, seven days a week, leave North Sydney. The key to the new system is that the units operate in a loop movement to and from each of the five points on a daily basis. To provide the service the railway has invested in seven highway

tractors and seven dual-chassis trucks.

Before the container-service began, mail was carried in small wharf containers by ferry, across the Cabot Strait, where it was removed from the containers and taken by road and rail from Port-aux-Basques to inland points. The repeated handling in this method was both costly, owing to supplementary highway and ferry charges, and time-consuming. Almost 1,600 bags of second, third and fourth class mail were despatched daily from North Sydney to Newfoundland, while the return volume was some 400 bags a day. Domestic first-class mails are transported by air as they are elsewhere in Canada.

With the new service, six containers are loaded on the overnight ferry to Port-aux-Basques, where they are transferred to three flat-bed trucks for transportation by road to Corner Brook, Deer Lake, Grand Falls/Gander, Clarendville and St. John's.