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Satellites suggested for surveillance of Canada's sovereignty

A report prepared by a Federal Government task force, released by Energy, Mines and Resources Minister Alastair Gillespie last month, deals with the prospects of launching in the 1980s a satellite equipped with a new microwave radar system to meet Canada's surveillance needs until the year 2000.

The extension of Canada's offshore limits to 200 miles, together with increasing oil and gas exploration and tanker traffic in the Arctic and off the east and west coasts, led the Government to consider the use of radar-equipped satellites to cover large areas with accuracy, timeliness and reliability. (Radar is necessary because it is able to penetrate cloud and darkness.)

According to the report, *Satellites and Sovereignty*, "surveillance" includes monitoring environmental conditions — sea state, ice, fog, surface winds, temperature and oil pollution, in addition to the move-

ment of ships, oil-drill rigs and exploration activities. Satellites, however, unlike aircraft and ships, cannot investigate unknown features in detail.

The task force study discusses five options for a Canadian surveillance satellite: an all-Canadian satellite without international participation; a Canadian satellite with international participation; other nations' satellite program, influenced to meet Canadian needs; purchase of surveillance satellite data from the United States; and no surveillance satellite activity.

Participation with NASA

The National Aeronautics and Space Administration (NASA) in the United States plans to launch a "proof-of-concept" satellite, called SEASAT-A, in May 1978, which will have newly developed microwave sensors that are expected to be able to obtain previously unavailable data.

As a first step in a surveillance program

The SEASAT-A satellite will carry four microwave sensors which can "see through" darkness and clouds:

• The *synthetic aperture radar* produces very detailed radar pictures of the earth enabling the interpreter to detect ships, icebergs, floating ice, wave patterns, oil rigs and even navigation buoys which have radar reflectors. It is expected that oil slicks will be visible because of the smoothing effect oil has on small wavelets. These radar pictures will outline geological structures in great detail and can also be used to assess the full extent of floods as they are happening. In combination with the LANDSAT visible-band pictures, the radar pictures will also help in carrying out the world wheat crop inventory.

• By measuring reflections from the small wavelets on the sea surface, the *microwave scatterometer* is expected to provide daily information on the strength and direction of the surface winds on all oceans.

• The *scanning multi-frequency passive microwave radiometer* will produce data which will, when interpreted, yield sea-surface temperatures, amount of moisture in the air near the sea, and distribution of floating sea ice. The instrument is expected to enable scientists to estimate snow depth and soil moisture. This knowledge is important for agriculture and flood predictions.

• A *radar altimeter* will measure to within eight inches the distance between the 400-mile-high satellite and the earth's surface. It can therefore be used to measure the heights of waves and the storminess of the world's oceans. This information would be useful for routing ships around bad storms and for warning offshore drill rigs of oncoming heavy seas. The instrument will also be used to monitor changes in the height of the polar ice caps, yielding useful data for the study of world-wide climate changes.



This week in 1841, on February 10, the provinces of Upper and Lower Canada were united to form the province of Canada, the capital of which was Kingston.

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