

conditions in northern areas, including information on different ice types. The radar will also provide data on ocean wave spectra, including wave height, direction and frequency. Additional sensors have been proposed for RADARSAT and these would provide a variety of data, including weather information based on ocean surface temperatures. An important aspect of RADARSAT is the fact that it will monitor the North on a daily basis, and should therefore enhance Canada's claim to sovereignty over the Arctic regions.

There will be substantial economic benefits for all regions of Canada if RADARSAT is launched and operates successfully, and these potential benefits have been documented by the Department of Energy, Mines and Resources. First, there will be industrial expenditures for the hardware which will provide employment and revenue. Second, there will be economic gains from the use of the resource-management data generated by the satellite. Third, there will be economic benefits from the expansion of the remote-sensing service industry in both domestic and export markets. However, although these benefits are real and significant, there will have to be a net expenditure by the Federal Government to make the project feasible.

The RADARSAT program in its present form has been reduced in scope, principally through deletion of an optical sensor and reduction of the satellite's life span from ten years to five by eliminating a planned in-space servicing capability using the space shuttle. These modifications have reduced the total cost of RADARSAT from \$978 million to \$635 million; the Federal Government's net contribution has been similarly reduced from \$635 million to \$236 million. Canada's two international partners will contribute most of the balance of RADARSAT's total cost, with three Canadian provinces and private industry making smaller contributions.

Although the Federal Government has stated that the remote-sensing program of CCRS will be continued, the future of the RADARSAT project itself is in serious doubt at this time. Funding for the satellite has not been approved and a positive Cabinet decision is needed for the project to go ahead.

D. European Space Agency (ESA)

Canada maintains a continuing commitment to industrial collaboration with European partners in space activities. A formal arrangement with ESA is the central feature of this cooperative effort. Canada's participation in ESA's communications and remote-sensing satellites was noted earlier in this Report. Canada is also participating in the study phase of the French spaceplane program, Hermes. This effort has the potential to enable Canadian industry to capitalize further on investments in the CANADARM program.

Over a five-year period to FY 1990/91, Canada will spend an estimated additional \$27 million on cooperation with ESA; estimated additional expenditures to FY 2000/01 are \$123 million.

E. Canadian Astronaut Program

The Astronaut Program, with a description of its goals and objectives, was discussed earlier in this Report. Under the 1986 Space Plan, the program will continue, partly in anticipation of Canadian astronauts working on Space Station to support those experiments