

### Canada/U.S. development of space shuttle system

The Department of External Affairs has announced that an exchange of diplomatic notes took place June 23 between Canada and the United States confirming the agreement between the National Research Council of Canada (NRCC) and the National Aeronautics and Space Administration (NASA) for participation by the National Research Council in the development of the Advanced Space Transportation System.

Under this agreement, the NRCC, through contractual arrangements with Canadian industry, will design, develop and construct the first flight unit of the Space Shuttle Remote Manipulator System (SRMS). The SRMS is an arm-like device, 50 feet long, attached to the cargo bay of the *Orbiter* spacecraft, the orbiting element of the Space Shuttle. The SRMS will be used to move scientific satellites and other space vehicles from the cargo bay and place them in orbit. It will also be used to retrieve recoverable payloads for return to earth.

SPAR Aerospace Products Limited is the prime contractor for the SRMS and with RCA Limited, CAE Electronics Limited and Dilworth, Secord, Meagher and Associates Limited, its principal subcontractors, has been working on the preliminary design since November 1975. SPAR and the subcontractors are also designing and building a simulation facility to simu-

late on earth the conditions under which the SRMS will be required to operate in space.

The agreement is similar to the NASA agreement with the European Space Agency (ESA) whereby ESA is to design, develop and build the SPACELAB, a manned space laboratory that fits in and remains with the *Orbiter* spacecraft during a SPACELAB mission.

Both Canada and Europe are funding the cost of the research and development for their respective parts of the Space Transportation System program.

#### Benefits to Canada

The NASA/NRCC agreement assures Canada access to both the Space Shuttle for spacecraft launches and service missions and to the SPACELAB for experiments and applications, and in the interim, to conventional launch facilities. Access to space is needed by Canada not only to maintain research programs in the space sciences but also to exploit the expanding potential of satellite communications and sensing systems. The RMS program will also improve Canada's industrial capacity for the design and construction of advanced space systems and provide a technological base from which Canada could participate in the future global market for remote handling systems capable of operating in a variety of environments.

### Ontario energy to New York and Michigan

A request by Ontario Hydro to export interruptible energy to the States of Michigan and New York has been approved by the National Energy Board. The Board has granted a licence for the export of up to 15,000 gigawatt-hours of surplus interruptible energy a year for five years from July 1 this year to June 30, 1981.

In an application dated June 18, Ontario Hydro had requested a ten-year licence for the export of up to 10,000 gigawatt-hours in 1976 gradually increasing to 30,000 gigawatt-hours in 1985. The Board limited the licence to a five-year term because of uncertainties involved in the calculation of surplus reserves after 1981.

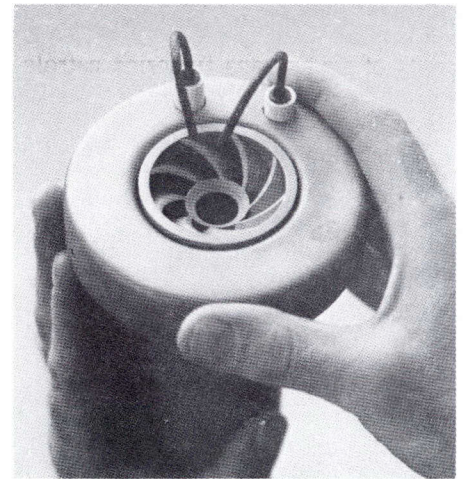
The export is subject to curtailment at any time if the energy is required in Canada. The floor price for the export of electricity by Ontario Hydro is currently 21.5 mills per kilowatt-hour. Ontario Hydro must submit pricing schedules to the Board for approval on an annual basis.

The Board has also granted a licence allowing unscheduled circulating exchange of inadvertent power and energy, up to 8,000 gigawatt-hours a year, for nine and a half years from July 1 to December 31, 1985. These transfers do not involve a net export of energy from Canada.

Ontario Hydro sells surplus energy to four major power utilities in the U.S.

### Swirling air generator will save furnace fuel

A 10 percent saving in the cost of furnace oil is expected with a new type of nozzle design for oil burners developed in the Canadian Combustion Research Laboratory of the Department of Energy, Mines and Resources. Some 60 per cent of homes in Canada are heated with oil.



The new oil burner assembly is being patented by Canadian Patents and Development Limited (CPDL), a subsidiary of the National Research Council. CPDL's main object is to assist in making the licensable products of publicly-financed research or development available to the public, through industry.

Conventional designs of oil burner assemblies for home heating fuel oils employ a traditional fuel-air mixing process in which the evaporation and combustion of the fuel oil take place simultaneously.

The new burner design produces a clean, soot-free flame, compared with the conventional one. It also provides approximately 10 percent improvement in efficiency, an important consideration in energy conservation. This is achieved by the new nozzle design which imparts a swirling motion to the fuel-air mixture, improving the diffusion of the oil particles through the air, so that they more or less completely evaporate prior to combustion. A modification can be made to existing home furnaces and, in addition, furnaces using this assembly will require less cleaning.

A number of prospective licensees are currently evaluating the device.