

ARCTIC WINDMILL HAILED AS REVOLUTIONARY ROBOT

by John McManus, Winnipeg Free Press

Some time in the late fall, pilots flying over the ice islands in the Beaufort Sea will see a machine planted in the pack-ice that looks as if it started out to be a windmill and grew up to resemble an egg-beater.

The device is in fact, a distant cousin of the windmill. In spite of its apparent simplicity, it is expected to have a revolutionary impact on everything from weather data collection to pipeline transmission and marine safety.

Harry G. Sevier, head of the vehicle design rocket and space division of Bristol Aerospace of Winnipeg in an interview described the wind-powered turbine and its maiden task and trial run on the near side of the North Pole, using the generic term windmill.

“Five years ago, when you talked about windmill power, people thought you were odd. Now the power crisis has brought it into a circle of scientific respectability,” he said.

The windmill Bristol built is calculated to blend the principles of an antique power source with space age technology.

In short, it will provide continuous power for an unmanned weather station.

That's the short version.

Bristol already is in jet overhaul and manufacturing airline components and designs systems for nuclear power stations, as well as building research rockets being used all over the world – so why not something that can be referred to simply as a windmill?

The Bristol windmill and the demands on its design and operation may well be the biggest challenge the Winnipeg company has faced.

The space division chief said the company became involved in wind-power turbine development last fall. It is working on design and production of a range of ground-station data-transmitting devices, as an extension to its experience in rocket telemetry systems.

Its developments have led to a contract from the Canadian Atmospheric Environment Service (the weather office) to design and build a prototype automatic weather station to be installed on an ice island in the Beaufort Sea.

Since the installation called for a six-month unattended operation (and this meant an excessive number of storage batteries), Bristol elected, with AES support, to use wind-power to keep the batteries charged.

Mr. Sevier said the company chose to use a vertical-axis concept pioneered by the National Research Council.

He cited five reasons in support of the concept – existence of a sound technical base, its simplicity (which will allow two men to erect the equipment on the ice) and its compactness (the unit will have to be flown, along with all other sea stations components in a single Twin Otter aircraft).

The windmill is also built to face winds up to 100 m.p.h. It can be produced for about \$115,000, and tests have shown it has high reliability.

The role of the power-generating machine will be to keep its companion weather data station in constant operation.

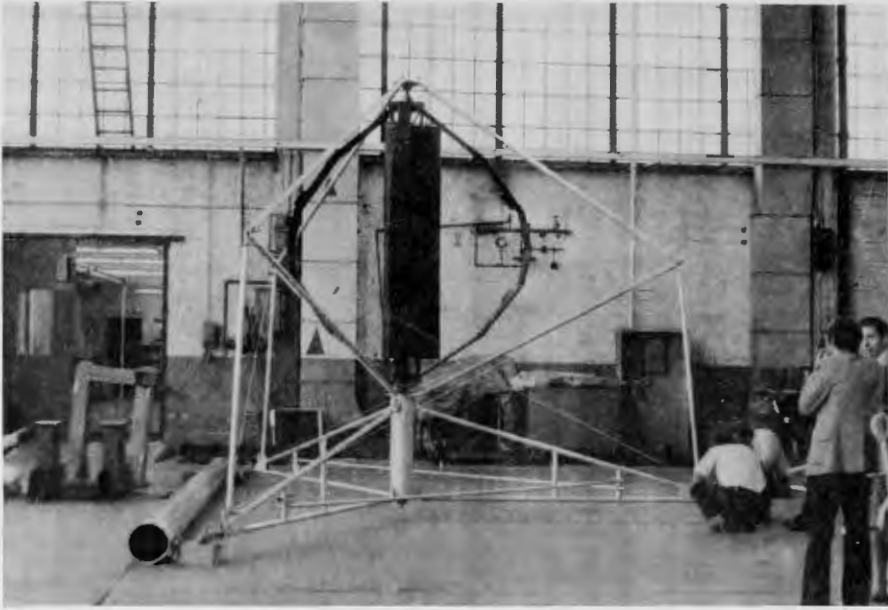
The search in the Arctic for ice-locked fossil fuel has created a need for regular and accurate weather forecasts that now are beyond the reach of the long-established weather stations of the lower Arctic.

The Bristol spokesman pointed out that the Beaufort project is one of many financed by oil companies.

How the weather data will reach northern exploration companies and other users is a saga in itself.

From windmill Beaufort, the data station will send out weather conditions every three hours to a satellite over the equator, 23,000 miles from icecap.

The satellite will relay the message to a centre near Washington, D.C. and on to Toronto. Then the information will go by teletype to Edmonton and be broadcast to the North.



Arctic Windmill

Pushing out an ultra high frequency (UHF) signal, the weather cycle will be completed every half hour.

Bristol had some help when it encountered a conflict in the wind speed needed to overcome the generator field current and transmission static friction. It solved the problem with a unique direct-drive alternator which happened to be under development at the University of Manitoba.

Mr. Sevier sees all kinds of possibilities for windmills of various sizes – all the way from monitoring pipeline flows, powering water buoys and possibly even providing electricity for homes.

The Winnipeg windmill is based on the idea of two research council scientists, and the U.S. has also picked up the idea.

The Bristol engineer said: “Bristol is the first to design one as a real tool for a specific use.”