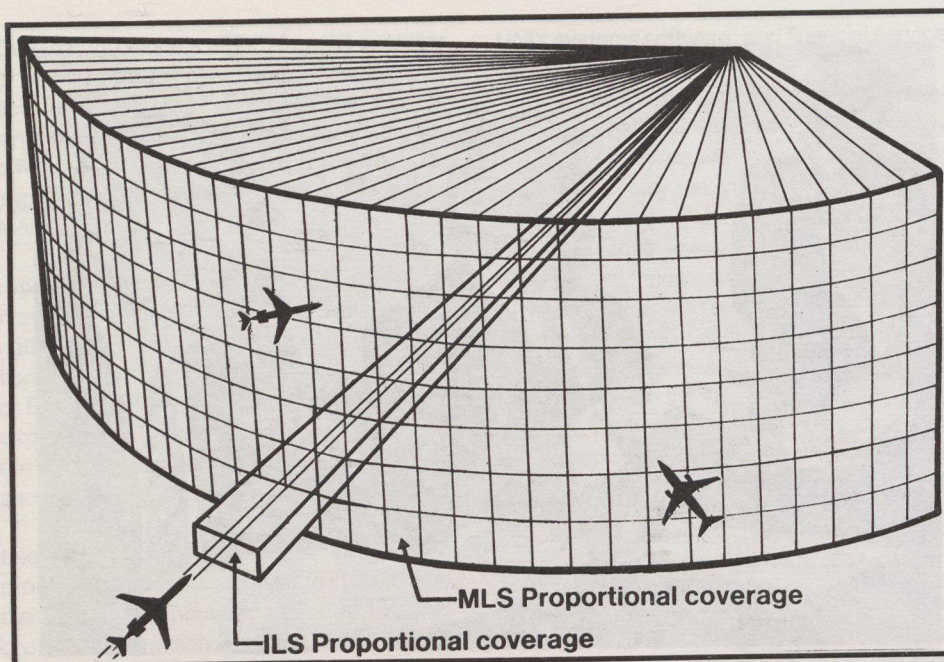


Microwaves for safer aircraft arrivals



Bernard Bemmell, The Globe and Mail

Aircraft will have a number of approaches to a runway with the microwave landing system.

A new technology Microwave Landing System (MLS) to allow airplanes to land more safely will be installed at airports across Canada. The MLS will replace the Instrument Landing System (ILS) at some 70 major Canadian airports and basic navigational instruments at smaller airports.

The first installation in this \$450-million program is expected to be made in 1988, and by the year 2000, some 150 MLSs will be operational across the country.

Optional landing paths

The new MLS, using the latest electronic technology and linked to computers aboard aircraft, will greatly extend the use of air-space around airports by establishing several approach paths for landing instead of a single ILS path. The space of the new system extends up to 70 nautical miles wide to an altitude of more than 6 000 metres and out to a distance of 20 nautical miles from the runway, compared with the 27 nautical miles of the ILS.

The basic MLS elements are an approach azimuth antenna, an approach elevation antenna, and distance measuring equipment (DME). The azimuth antenna project is a vertical fan-shaped radio scanning beam that sweeps 60 degrees to the right and left of the runway centreline. The elevation antenna, which scans to an altitude more than 6 000 metres, provides the angle of the aircraft's elevation with the runway, while the DME provides continuous distance-from-touchdown data.

This information is transmitted to com-

puters on the airplane allowing the pilot to accurately use curved, segmented and high angle approaches to landing in contrast to the low angle (three degrees) straight-in approach of the ILS. The ILS system uses a single electromagnetic beam to guide the plane to the centre of the runway.

In addition, below 60 metres ILS signals are subject to ghost signals reflected from nearby buildings or other large objects. The microwave signal, however, is not affected by geography and cannot be bent by an obstruction. It is also less sensitive to environmental conditions such as snow which can disturb the ILS signals.

Testing phases

A test MLS unit has been installed at Ottawa Uplands Airport to gain technical and operating experience. The MLS team is also co-operating in its test program with the Federal Aviation Administration in the United States, where 1 250 MLS units are to be installed by the end of the century.

An MLS system is operating at Jasper, Alberta, to provide accurate aircraft guidance in mountainous terrain. Also, five private MLS installations are under consideration by companies and provincial governments for use in remote airports.

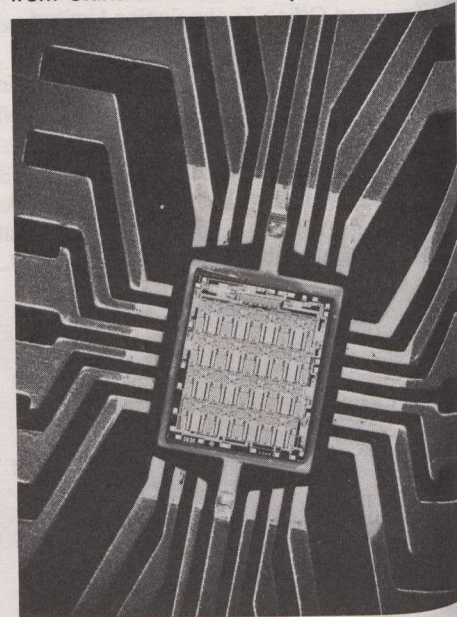
Installation of the units in Canada is being undertaken concurrently with the federal government's new radar modernization program, which will eventually lead to pre-programming an aircraft's flight from take-off to landing and many stages of the flight will be under the supervision of computers.

Technology on tour

A photographic exhibition, *Pebbles to Computers*, illustrating how contemporary technological achievements have evolved from the creativity of human cultures of past centuries from around the world, is on view at the National Museum of Science and Technology until March 10 when it will tour in the United States and Europe.

The exhibit, sponsored by the Department of External Affairs, features some 100 photos of technological devices by Hans Blohm. The photos illustrate the relationship between technology, particularly communications, computers and information technologies, and cultural life. The collection highlights Canada's important contribution to the development of modern communication and computer technologies and reaffirms Canada's leading role in research in the area.

Devices have been created by human cultures over the centuries to calculate, communicate, store and process information, and manipulate nature's energies. Those in the exhibition include Ojibway paintings near Lake Superior, a magnetic storage disc, the first word processor from Montreal, the world's oldest printed book from China and silicon chips.



Integrated circuit on a carrier frame.

Museum curator Ted Paull said that Hans Blohm's photographs bridge the gap between the 'hard-edged' world of high technology and the intuitive world of human culture. "They clearly show the relationship between natural and man-made forms, extending our vision from the world of the microchip to the depths of space, from prehistoric times to the frontiers of modern scientific exploration," he said.