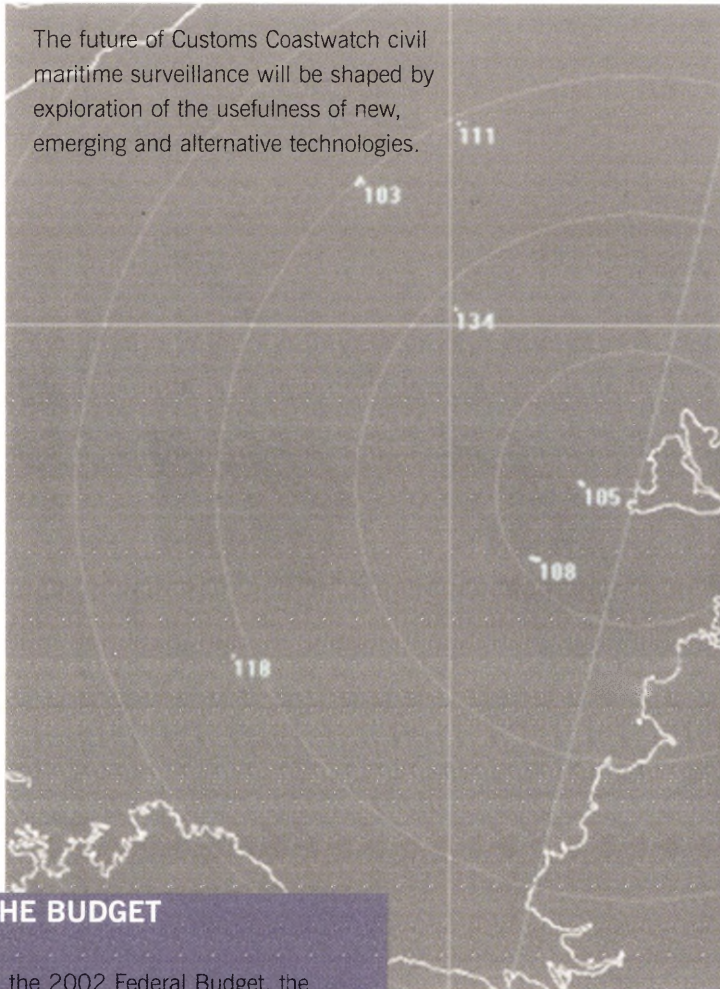


High frequency surface wave radar

By Catherine McDonald

The future of Customs Coastwatch civil maritime surveillance will be shaped by exploration of the usefulness of new, emerging and alternative technologies.



These receive-array antennas were on Bathurst Island, near Darwin, during the trial.

THE BUDGET

In the 2002 Federal Budget, the Government announced that Customs will receive an extra \$12.8 million over four years to trial, in conjunction with Defence, high frequency surface wave radar technology. HFSWR can provide surveillance coverage beyond the capabilities of conventional microwave radar. The outcome of this operational evaluation will inform the Government of its options for acquiring a more comprehensive HFSWR network.

Customs regularly evaluates new technology to test its effectiveness in performing its wide range of responsibilities. On of the more difficult jobs is patrolling Australia's vast coast line. Therefore Customs Coastwatch division has a particular interest in looking at the latest technology and testing its effectiveness.

The Manager of Coastwatch Development, Tony Antoniou, has

been seconded from the Defence Science and Technology Organisation (DSTO) to manage the Coastwatch Future Concepts sub-section. This area is responsible for collecting information on new technologies and for assessing those technologies and their potential application to the Coastwatch task. The section interacts with DSTO and other external technical and scientific organisations, and also draws on the operational experience and technical

expertise of other border integrity organisations such as the US Coastguard.

“Coastwatch needs to be aware of emerging technologies in preparing for the future,” Mr Antoniou said.

“There are new technologies that have particular potential for use in offshore surveillance activities.”

One of these technologies, which will be the subject of a joint Customs-Defence operational evaluation over the next four years, is high frequency surface wave radar (HFSWR), a technology that has benefited from many years of research related to the JORN project.

JORN, or the Jindalee Operational Radar Network, managed by the Department of Defence, is Australia’s sophisticated billion-dollar radar sky-wave over-the-horizon radar system, designed to monitor air and sea movements over large areas.

Surface wave radar does not use the ionosphere to increase its detection range beyond line of sight, but instead relies on refraction of the signal around the curvature of the earth, which occurs at high frequencies over seawater.

HFSWR development has accelerated in the past decade, offering increasing potential for surveillance capabilities.

In 2000, Customs participated in a limited trial of HFSWR near Darwin. The radar covered the approaches to Darwin and detected a variety of targets typical of the types of interest to Defence, Customs and other government agencies concerned with the integrity of Australia’s borders. System benefits identified during the trial included:

- all-weather, 24-hour air and sea surveillance, and the ability to detect and track targets within a 120 degree sector and a range of up to several hundred kilometres (an area in excess of 90,000 square km);

- tracking of aircraft at low and medium altitudes;
- gathering of real-time information that could be fed directly back to the Customs Coastwatch National Surveillance Centre; and
- a system that can be relocated when new high-risk areas are identified.

“However, only an extended operational evaluation will determine whether this technology presents a viable, cost-effective option for Customs,” Mr Antoniou said.

“We will be focussing the evaluation on the benefits the radar may provide for coastal surveillance activities such as locating and tracking vessels of interest in Australia’s maritime zones. We will also assess its impact when it is used alongside other surveillance options. For example, whether the radar can be used to direct an aircraft to a target that needs further investigation, reducing the need for surveillance aircraft to carry more extensive, and potentially less-productive, searches.”

The cost of a single radar is around \$8 million, with \$2 million a year in ongoing costs.

Before the last election, Prime Minister John Howard announced the \$175.5 million *Protecting our Borders* package with a focus on crucial areas of maritime surveillance, including radar capacity. The package promised to build on the already announced \$275 million initiative to enhance Australia’s over the horizon radar capability.

He said the Government would strengthen Australia’s extensive radar network with \$12.8 million in additional funding provided to Customs over the next four years. This allocation is the Customs contribution towards the cost of the joint operational evaluation of HFSWR technology.