

as a long-term solution for surveillance of any substantial area. Their difficulties are compounded by stealth technology, especially in view of the fact that the radar will see an approaching low-flying cruise missile almost head-on, the worst aspect for early detection. But sited in an aircraft or space vehicle, not only will a radar have a clear line of sight to long range, but it will see the cruise missile from above, presenting a much bigger target and one much more difficult to conceal by stealth. Moreover, airborne infrared sensors can be used to detect the heat from the exhaust of the cruise missile's engine, provided that the line of sight is not obscured by cloud. And an aircraft or satellite is less vulnerable to jamming than a facility in a known fixed location.

Over-the-horizon radar has two advantages over ground-based microwave radar, and may be able to detect cruise missiles at long range.⁵ The small, low target will return more energy upwards in the direction of the reflected path from the ionosphere than it would in the direct head-on aspect seen from a line-of-sight radar at ground level. And the longer wavelength may resonate with the wings or fuselage of the missile, which would produce an enhanced reflection.

While initial detection followed by identification constitute the most vital functions of surveillance, it would also be desirable to be able to track the subsequent movement of missiles, aircraft, submarines, or ships after they have been identified and warning achieved. BMEWS does this for ballistic missiles, but unless AWACS happens to be in the right place at the right time, or an interceptor is in contact, surveillance of the track of an aircraft or cruise missile is lost as soon as it passes out of the cover of the North Warning System.

Initial detection and identification provide the crucial early warning needed to alert the leadership and reduce the vulnerability of the retaliatory forces. The value of

⁵ "Maine OTH-B Completes Tests; GE to transfer system to USAF," *Aviation Week & Space Technology*, 9 April 1990, p. 52. This article mentions that the Maine radar has seen cruise missiles, but that it would be extremely expensive to enhance this capability.