Except for the occasional patrol by airborne warning and control (AWACS) aircraft, or the fortuitous presence of a warship, the systems to detect bombers are all ground based. The Over-the-Horizon (OTH) radars cover sectors shaped like a pineapple slice, surveying large areas of the North Atlantic and North Pacific Oceans (see Figure 1), but these cannot function in the Arctic, because of auroral activity, or at ranges inside a "dead zone" extending out to about 800 km from the installations, because of the angles of reflection from the ionosphere.

Conventional radars sited along the Atlantic and Pacific coasts will detect high altitude bombers at ranges of 300 km or so, but far less if they are flying low. Across the northern edge of the Alaskan and Canadian mainland there is the North Warning System, consisting of a single line of radars able to detect aircraft at virtually any altitude, but unable to track their progress once they pass the single line.

AWACS aircraft can be flown to patrol a considerable area north or south of the North Warning System, or off the coasts, but there are not enough of these to provide any continuous coverage.[1] Fighter aircraft can be sent to intercept a target being tracked by radar, but which has not been identified by comparison with flight plans or by radio communication. For this purpose Canada has established Forward Operating Locations (FOLs) at bases in the Arctic close to the North Warning System radar line.[2]

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[1] "USAF, NATO Invest Heavily in AWACS Electronic Upgrade," *Aviation Week & Space Technology*, 1 January 1990: p. 45. This article states that 34 AWACS aircraft are assigned to the United States where they are under control of the Tactical Air Command. A limited number of these may be assigned to NORAD.

James W. Canan, "The Big Hole in NORAD," *Air Force Magazine*, October 1989, p. 57. The Commander of NORAD is quoted, regarding the number of AWACS required to provide twenty-four hour surveillance of the Persian Gulf: "... we would need ten AWACS aircraft, some tankers, and very large crews for maintenance and so forth."

[2] *Challenge and Commitment, A Defence Policy for Canada,* Ottawa: Ministry of Supply and Services, 1987. pp. 55 - 57.