Table A

COMPARISON OF SPACEBORNE, AIRBORNE, AND GROUND-BASED SURVEILLANCE

SATELLITE SURVEILLANCE

Strengths

- large swept area in a short period of time
- large field of view
- not limited by line of sight restrictions
- centralized ground infra-structure can be located in area of choice
- no territorial restrictions

Weaknesses

- coverage restricted to territory under orbit
- long re-visit time
- sensors have high initial cost, cannot be repaired on orbit and cannot be modified
- predictable flight path, difficult and expensive to alter once established
- difficult to generate high prime power on orbit without use of nuclear reactors
- complex command and control
- information must be remoted for decision making

AIRCRAFT SURVEILLANCE

Strengths

- can generate relatively high power levels
- equipment can be modified and maintained relatively easily
- mature technology, little risk in system performance
- components less costly than space qualified ones
- flexible and manoeuvrable, can fly below cloud cover
- line-of-sight restrictions far superior to those at ground based installations, good look-down low level target detection capability
- sensors display and decision making or information can be remoted

Weaknesses

- carriage of large antenna structures cumbersome
- requires basing and infra-structure close to operating areas for rapid response
- relatively short mission durations, requires a large number of resources for continuous coverage
- subject to territorial limitations
- manpower intensive

GROUND-BASED SURVEILLANCE

Strengths

- very high power levels possible
- very long ranges possible with direct path to elevated targets
- can utilize ionospheric bounce to increase ranges well beyond line-of-sight
- can utilize very large antenna structures, provides frequency flexibility
- system can be manned for real time display and decision making, or information can be remoted
- equipment can be modified and maintained
- components are less costly than for airborne or spaceborne applications

Weaknesses

- line-of-sight limitations reduces the ability to detect low targets (minimized by siting on high ground, which can cause logistic difficulty)
- inflexible geographically once installed
- most convenient to be at least semi-permanently located in the area to be covered
- manpower and infrastructure intensive
- vulnerable to attack