

The Strengths and Weaknesses of Airborne Surveillance

As platforms for surveillance of activity on the surface of the earth, manned aircraft have had remarkable success, at first with visual observation, then photography, and more recently with radar, electro-optical, and other modern sensor systems.

Aircraft cannot match satellites in speed of sweeping over the earth. Instead of 450 kilometres a minute they may cover 15. Neither do they have as large a field of view, although this is often unimportant because the useful maximum range is limited by factors other than line of sight. In peacetime they must also obey the stricture of not violating sovereign airspace of another country without permission.

Aircraft far excel satellites in manoeuvrability, ability to fly under cloud and close to targets, and ease with which electrical power can be supplied. A large aircraft can be quickly dispatched to examine an area of interest and remain there for hours. Moreover, in the case of targets wishing to avoid observation, the arrival of the satellite is predictable, while the aircraft is more likely to appear without warning.

A major advantage of manned aircraft is the opportunity to change or repair sensors between missions, or (often) to adjust them in flight. Another is the capability of the crew to observe something unexpected, but of potential interest, and quickly modify the mission in order to investigate further.

The Strengths and Weaknesses of Ground-Based Surveillance

The greatest limitation of ground-based surveillance is the line of sight. The area of the earth's surface or the volume of air that can be observed from a point no more than a few feet above ground level is extremely small when compared to the field of view from a satellite or a high-flying aircraft. An exception can occur at a particularly advantageous site such as on a high mountain overlooking a flat plain or the sea.