APPENDIX B: ISR RESOURCES

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This section describes the types of resources employed to satisfy information requirements through the global integrated intelligence, surveillance, and reconnaissance (ISR) operations. Understanding the collection resources allows their effective allocation to requirements within the global integrated ISR operations. Several of the systems providing input to the global integrated ISR operations are not dedicated global integrated ISR resources or systems and ownership may be less important than the actual information satisfying the requirements.

AIRBORNE SYSTEMS

Airborne ISR platforms and their associated ground stations generally are among the most responsive assets available. Aircrews can recognize and respond to changing conditions and are able to modify missions in progress. With their ability to fly long distances, airborne platforms can cover a large area with a mix of sensors. Additionally, a majority of these assets have a common data link between aircraft or with ground stations allowing them to distribute large volumes of information in near-real time. During peacetime, the majority of airborne global integrated ISR missions are accomplished using standoff techniques. A standoff mode is also used during military operations when the threat is too great to allow high value assets to penetrate adversary territory or when over-flight of an area cannot be completed due to political sensitivities. The primary advantage of the standoff mode is that assets are relatively free from adversary surface-to-air and air-to-air attacks. The primary disadvantage is the limited range and depth of sensor coverage.

Remotely Piloted Aircraft (RPA) provides significant advantages over other reconnaissance assets, but commanders must be aware of their limitations. The greatest advantage of these systems is that they normally do not put friendly personnel at risk, can have relatively long loiter times, and are generally less expensive than today's high-value manned assets. RPA limitations vary according to system and operational requirements. RPA technology is maturing rapidly, and platforms can be configured with a broad range of ISR sensors or weapons payloads. Because control authorities and mission priorities can shift between users during multi-role RPA missions, commanders should carefully delineate clear lines of authority. RPA flight paths can be preprogrammed or remotely controlled. Commanders should understand RPA capabilities to support mission requirements as well as their limitations.

SPACE-BASED SYSTEMS

Space-based global integrated ISR are an integral part of military forces and provide support across the range of military operations (ROMO). Space systems provide information to commanders allowing them to quickly assess the situation, develop concepts of operation, and distribute changes to their forces. However, commanders must also be aware of the advantages and limitations of these systems. The prime advantage of space-based systems is their global and wide-area coverage over denied areas where little or no data can be obtained from ground and airborne sources. Other advantages these systems possess include mission longevity and reduced vulnerability to adversary action. While able to provide worldwide coverage, demands on individual space-based systems often exceed their capacity and their associated orbit requirements may limit the ability to meet operational requirements. Space-based ISR is limited by advanced denial and deception techniques. Space-based systems are owned by military, nonmilitary, and national agencies. International cooperation in military space-based ISR systems with Allies and other partners may contribute to US national security objectives by enhancing interoperability, supporting coalition operations, and building partnership capacity.

Military Space-Based Systems provide support to the President, Secretary of Defense (SecDef) and the military at all levels. They employ a variety of sensor suites and provide a broad range of capabilities. During peacetime, space systems routinely support training exercises, peacekeeping operations, indications and warnings (I&W), disaster and humanitarian relief efforts, counterterrorism, and counterdrug operations. As an example, overhead ISR sensors can provide early detection of ballistic missile attack and downlink this information to the appropriate ground stations, thereby allowing early warning. Environmental monitoring systems are crucial to providing an asymmetric war fighting advantage in which we anticipate and exploit the condition of the atmosphere, oceans, soil, and the space environment in order to support friendly military operations and deny those same advantages to adversaries. Awareness of environmental conditions can be the difference between the success or failure of an operation or mission. Space-based global integrated ISR systems can also provide military forces with geographic and detailed terrain information that enhances mission planning capabilities. Additionally, these systems can often cue or be cued by other global integrated ISR systems to watch a specific area of interest (AOI), enhancing accuracy and reaction times for the users of that information. Finally, space communications support global integrated ISR operations by distributing the products generated from global integrated ISR systems, while navigation systems provide a variety of sensors with accurate positioning information.

Non-Military Space-Based Systems can complement military space systems and include civil, commercial, and allied assets. These systems possess a variety of capabilities; however, in some cases their availability may be limited. Often, arrangements are made for military personnel to have access to non-military assets. However, these arrangements are often subject to legal review and take time to activate. In short, space system requirements need to be addressed prior to military operations.

National Satellite Systems are controlled by the US intelligence community and provide support to the President, SecDef, and the military at all levels. These resources provide critical data and are responsive to military information needs. These systems are a limited resource. Requirements for these systems need to be worked in advance and detailed justification for their use needs to be provided to the collection manager (CM).

Ground Based Systems around the world are equipped and tasked to collect information for the intelligence disciplines previously described (e.g., Signals intelligence [SIGINT], Measurement and Signature Intelligence [MASINT], etc.). These sites may satisfy national, theater, or local information requirements, or any combination.

Air Surveillance and Target Acquisition Radars, used to control the movement of aircraft, provide warning and control over air resources within a designated area. The advantage of these systems is that they provide an additional layer of control and observation that may not be available with other surveillance systems. A disadvantage of these systems is unique sensor limitations which are susceptible to adverse atmospheric conditions and electronic jamming. Additionally, air defense sensors are limited to line-of-sight surveillance.

Missile Warning and Space Surveillance offer a significant ground-based global integrated ISR resource, the space surveillance network (SSN), and the ground-based missile warning sensor system. The SSN's purpose is to find, fix, track, and characterize man-made objects in space. An example of an SSN system is the ground-based electro-optical deep space surveillance (GEODSS) system. SSN data is used to determine adversary space order of battle (OOB), adversary satellite over-flight warning, and adversary satellite status. This information is available to theater commanders and provides them early warning and additional information which can be used for denial and deception techniques. Although the primary function of ground-based missile warning sensors is to provide identification and characterization of ballistic missile attacks on the United States and its allies. They also contribute to space surveillance. One example of this type of system is the ballistic missile early warning system.

CYBERSPACE-BASED SYSTEMS

Cyberspace is an important source of ISR information. In addition, cyberspace-based global integrated ISR capabilities are also an integral part of military forces and enable operations across the ROMO. Cyberspace-focused ISR includes digital network analysis and related intelligence support to Air Force cyberspace missions. Specific, specialized units provide timely and actionable all-source ISR services and products in support of 24 AF/AFCYBER and national cyberspace operations. This support is generally characterized within five cyberspace focused ISR areas: current intelligence and reporting; I&W (to include PED); threat attribution and characterization; Joint Intelligence Preparation of the Operational Environment (JIPOE); and computer network exploitation under national intelligence and United States Cyber Command (USCYBERCOM) authorities.