APPENDIX A: INTELLIGENCE DISCIPLINES

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Global integrated intelligence, surveillance, and reconnaissance (ISR) operations collect data which becomes finished intelligence only when processed, analyzed, and integrated. This data can be collected through a wide variety of means. In order to properly plan and manage global integrated ISR operations it is important to have a basic understanding of the intelligence disciplines. The following is a list (not all-inclusive) of intelligence disciplines relevant to Air Force ISR operations.

GEOSPATIAL INTELLIGENCE

Geospatial intelligence (GEOINT) is defined as "the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. Geospatial intelligence consists of imagery, imagery intelligence (IMINT), and geospatial information."[1] GEOINT data sources include commercial satellites, government satellites, aircraft, maps, commercial databases, census information, Global Positioning System (GPS) waypoints, or even utility schematics. GEOINT is much more than the sum of its parts. In short, GEOINT can synthesize intelligence and data into conceptualized geographic spatial content which can provide commanders key operational intelligence (i.e., best vantage point for shooters, most advantageous entry points, spatial trends and patterns, etc.).

IMINT is defined as "the technical, geographic, and intelligence information derived through the interpretation or analysis of imagery and collateral materials."[2] It involves the collection and analysis of images that are recorded and stored. These images are used for historical comparisons, to locate adversary military forces/facilities and provide the commander insight into the adversary's capabilities. IMINT is also useful in understanding the physical terrain and the human impact in terms of significant cultural sites (governmental structures, historical sites, and schools), agriculture and urban infrastructure, water, electrical grids, etc. IMINT can be broken down into optical images, non-optical images, and full-motion video (FMV).

Optical literal imagery products are visual photos (recorded on film, tape, or electronically) which use visible light to illuminate the objects photographed.

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[1] JP 2-03, *Geospatial Intelligence in Joint Operations*.
[2] JP 2-03, *Geospatial Intelligence in Joint Operations*.

Non-optical non-literal imagery includes infrared, radar, laser-based, multispectral, and hyperspectral imagery. Infrared, radar, and multispectral sensors detect emissions in the non-visual portion of the electromagnetic spectrum. Each specific type of imagery has its advantages and disadvantages. Infrared signatures can be seen with next to no light but are often distorted by aerosols, moisture, and atmospheric gases. Radar imagery can be obtained during day or night and through rain/cloud cover. It can detect moving vehicles via moving target indicator systems. Radar imagery requires active illumination by a radio frequency pulse (the reflected return provides an image of the target). Multispectral imagery uses data collected simultaneously from two or more spectral regions or bands of the electromagnetic spectrum—in other words; the same scene is imaged in several spectral bands at the same time by the same sensor. The resulting image contains more detailed information than can be obtained through the use of only one band.

FMV is an imagery capability that can provide continuous moving coverage of a target area in near-real time. Use of full-motion video assists commanders in maintaining situational awareness and identification and tracking of targets, and presents the opportunity for our forces to respond as required. FMV has the potential to provide the unique combination of accuracy and persistence. In addition, many FMV assets have the advantage of employing various processing, exploitation and dissemination (PED) architectures for simultaneous near-real time dissemination.

Geospatial information includes the collection, information extraction, storage, dissemination, and exploitation of geodetic, geomagnetic, imagery (both commercial and national source), gravimetric, aeronautical, topographic, hydrographic, littoral, cultural, and toponymic data accurately referenced to a precise location on the Earth's surface. Geospatial services include tools that enable users to access and manipulate data, and also include instruction, training, laboratory support, and guidance for the use of geospatial data. Geospatial information is used in military planning, training, and operations, including navigation, mission rehearsal, modeling, simulation, and precise targeting.

SIGNALS INTELLIGENCE

Signals intelligence (SIGINT) is intelligence discipline comprising either individually or in combination all communications intelligence (COMINT), electronic intelligence (ELINT), and foreign instrumentation signals intelligence (FISINT), however transmitted.[3] Specifically, SIGINT uses intercepted electromagnetic emissions to provide information on the capabilities, intentions, formations, and locations of adversary forces. SIGINT also includes collecting; processing and exploiting data from dormant information in cyberspace then analyzes and produces, and disseminates finished intelligence to the warfighter. NSA is the US Government lead for cryptology, and its mission encompasses both SIGINT and IA activities. National Security Agency (NSA) maintains a unified organization to conduct SIGINT.

COMINT consists of information derived from intercepting and monitoring the adversary's communications systems. COMINT exploits the adversary's

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[3] Definition from JP 2-02.

communications, revealing the adversary's capabilities, intentions, perceived vulnerabilities and often, the adversary's perception of the United States and/or its coalition partners.

ELINT consists of information derived from intercepting and monitoring the adversary's non-communication emitters. It exploits the adversary's radar, beacons, and other non-communication signals, allowing friendly forces to locate adversary radars and air defense systems over a wide area.

FISINT consists of technical information derived from the intercept of electromagnetic emissions (such as telemetry) associated with the testing and operational deployment of foreign air and space, surface, and subsurface systems. FISINT can provide technical details of foreign weapons system development, which allows US forces insights into foreign technological advances.

MEASUREMENT AND SIGNATURE INTELLIGENCE

[Measurement and Signature Intelligence](#) (MASINT) develops intelligence using quantitative and qualitative analysis of data (metric, angle, spatial, wavelength, time dependence, modulation, particulate, plasma, effluent or hydromagnetic). Data is derived from specific technical sensors for the purpose of identifying any distinctive features (either reflected or emitted) associated with the target. Examples of MASINT might include distinctive infrared signatures, electronic signals, or unique sound characteristics collected by ground, airborne, sea, and space-based systems. MASINT can be used to monitor potential adversary technical developments and deployments, as well as emerging WMD threats.

HUMAN INTELLIGENCE

[Human intelligence](#) (HUMINT) is an intelligence collection discipline that uses people in the area of interest (AOI) to identify or provide insight into adversary plans and intentions, research and development, strategy, doctrine, and capabilities. HUMINT can provide several kinds of information. It can provide observations during travel or events from travelers, refugees, escaped friendly prisoners of war, etc. It can provide data on things the subject has specific knowledge, which can be another human subject; or, in the case of defectors and spies, sensitive information to which they had access. Finally, it can provide information on interpersonal relationships and networks of interest. The following are some sources of human-resourced information of global integrated ISR value.

Dedicated HUMINT collectors amplify, clarify, or verify information collected by other airborne, ground-based, or space-based assets. In many cases HUMINT, along with counterintelligence activities, are the best and only sources of adversary intentions. The Air Force has an organic HUMINT capability and works with DOD and other national-level agencies to collect on priority Air Force operational and strategic requirements. At the strategic level, Defense Intelligence Agency (DIA) manages the DOD HUMINT program, coordinates with the intelligence community on collection programs, and responds to standing, ad hoc, time sensitive requirements, and requests for information (RFIs) submitted by combatant commanders (CCDRs) and theater intelligence centers.

Special Operations Forces conduct special reconnaissance (SR) operations to obtain or verify information about adversary capabilities, intentions, and activities. SR operations complement national and theater global integrated ISR operations by obtaining specific, time-sensitive information of strategic and operational significance.

Aircrew and Ground Personnel conduct human visual surveillance and reconnaissance, which are the most basic and the oldest methods of intelligence gathering. Today, visual surveillance and reconnaissance information comes from a wide range of sources and often simply entails observer reporting and debriefing activities. Observers can include aircrews flying any type of aircraft or SOF conducting assigned missions as described above. Additionally, information gained from onboard aircraft systems such as weapon system video and defensive countermeasure suites can provide invaluable global integrated ISR information during operations. Security forces, explosive ordnance personnel, and other Airmen who operate outside the base perimeter are also sources of information that are of intelligence value.

Document and Media Exploitation is the processing, translation, analysis, and dissemination of collected hard copy documents and electronic media, which are under the US Government's physical control and are not publicly available. Exploitation of documents and media often provides valuable insight into operations, financial means, and associations that may not be accessible through other sources and may lead to further targeting efforts.

OPEN-SOURCE INTELLIGENCE

Open-Source Intelligence (OSINT) is the application of intelligence tradecraft to open sources of information, specifically involving the collection, processing (to include foreign language translation), and exploitation/analysis of multiple, independent open sources of information. OSINT sources include commercial scientific and technical databases, symposium proceedings, published strategy and doctrine, think tank publications, patent information, and other open sources available to the general public. A variety of exploitation techniques are practiced, including social network analysis. NASIC is the Air Force lead for OSINT.