



ADF SPACE CAPABILITIES AND ORGANISATIONS

The term *capability* has different meanings for different people. To Defence capability developers the term is most appropriately understood in terms of the Fundamental Inputs to Capability (FIC). To others it may simply mean having the *ability* to do something. The important question is this: Is ownership of the *thing* that provides the capability essential to the ADF's ability to achieve a defined outcome? This recurrent question is fundamental for space-based capabilities, as it has been for the basic air power tenet of centralised control and decentralised execution.

In the context of space capabilities, the ADF has historically neither owned nor operated its own space assets, relying instead on the products and services of others. Over the past decade, however, there has been significant reduction in the ADF's reliance on commercial and foreign military space assets for satellite communications. But for other critical enablers, the reliance has deepened. This *Pathfinder* discusses the key space-based technologies and several organisations that provide the ADF with the space capabilities it requires.

The ADF's war fighting effectiveness is heavily dependent on four space-based services.

Satellite Communications (SATCOM). Satcom services are perhaps the most critical of all space-based services on which the ADF depends. They are essential for C2 of deployed forces and provide the conduit through which operational, administrative, logistic, medical and other information are shared. Satcom services enhance operational tempo by providing capacity, accuracy and timeliness in the delivery of information.

Positioning, Navigation and Timing (PNT). The ADF makes extensive use of the Global Positioning System (GPS). This network is critical for accurate control and placement of fire power, including guided weapons; accurate navigation of air, land and maritime forces; and

providing the essential timing needed to synchronise communications systems.

Intelligence, Surveillance and Reconnaissance (ISR). ISR activities enable information support and superiority for the conduct of ADF operations. A critical enabler of the ISR mission is space-based systems that provide imagery; missile and other threat warnings; and a range of signals and electronic intelligence, all of which contribute to enhanced situational awareness.



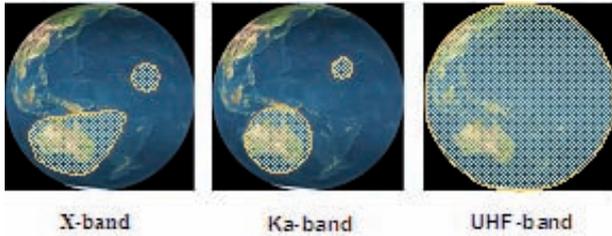
Meteorology (Met). Met information is used by all Services and is another important enabler for operations. Met satellites provide weather forecasts, tidal information for maritime operations, cloud and visibility information for air operations, rain fade for communications planning, and soil moisture content for analysing ground movement corridor trafficability.

The ADF's capabilities are enhanced by assured access to these four space-based services, facilitated through: Strategic Policy Division (SP Div), Chief Information Operations Group (CIOG), Defence Material Organisation (DMO), Defence Science and Technology Organisation, Headquarters Joint Operations Centre (HQJOC), and Defence Imagery and Geospatial Organisation (DIGO).

SP Div within the Strategy Group develops strategic policy on Defence's space requirements. Internationally, SP Div engages with key allies and regional partners on space policy through several staff posted overseas. SP Div develops strategic partnerships with allies, through policy guidance, negotiating terms and conditions, and obtaining Government approval. SP Div bears the responsibility for enabling ADF space capability through access to the four critical space services.

CIOG is the capability manager for Satellite Operations (SATOPS) and through the SATOPS cell in the Defence

Network Operations Centre (DNOC) is responsible for the management of all ADF satellite communications services. SATOPS directly controls and manages the Defence Payload System (DPS) on the Optus C1 satellite. The DPS provides wide-band satellite communications services to Australia's immediate region through Australian regional, steerable spot beams, and Earth coverage beams at X- and Ka-bands, and Earth coverage within the military UHF band, as shown in the images below.



To support ADF operations outside these coverage areas, SATOPS arranges for the lease of communications bandwidth through commercial satellite service providers such as INTELSAT, INMARSAT and Iridium, and through reciprocal arrangements for access to wideband and UHF coverage with allies.

Australia has also partnered with the US in the Wideband Global Satcom (WGS) program, which will, when fully operational, include a constellation of at least six X- and Ka-band communications satellites in geostationary earth orbits providing nearly global coverage (except for the polar regions).

DMO is responsible for all aspects of the system or equipment life cycle, from acquisition through to disposal. For space systems, DMO acquires and maintains all hand-held, mobile and strategic system elements owned by the ADO. These include Iridium satellite phones, small terminals such as INMARSAT, large transportable elements like the BTN Satellite Terminal Assemblage, and Satellite Ground Stations such as those at 136 and 138 Sig Sqns in Brisbane and Melbourne.

DSTO supports the ADF by providing scientific advice to Capability Development Group, DMO and the Services regarding space-based technologies and services.

HQJOC, is responsible for processing space support requests by operators through the embryonic space cell in the Air and Space Operations Centre (AOC). Services provided include satellite vulnerability reports

(SATVULREP) for deployed elements, dissemination of the recognised space picture (RSP), and all liaison with the US Joint Space Operations Centre (JSpOC) and GPS Operations Centre (GPSOC).

DIGO is the coordinating capability manager for geospatial information. It is responsible for providing all forms of geospatial imagery products to war fighters and commanders to enhance situational awareness.

Chief of Air Force (CAF) is the Capability Manager (CM) for specific areas of space capabilities that include space-based position, navigation and timing, space related warfare and environmental awareness. CAF is also responsible for the coordination of all capability aspects of the space environment. The Defence Space Coordinating Office (DSCO), a joint element that functions within Air Force Headquarters, has the role of coordinating the defence space enterprise and supporting CAF in his role as the space CM. This includes coordination strategic planning of space related activities. Although primarily involved at the output level, DSCO is also responsible for the development of space expertise, guidance, engagement as well as concept exploration and exploitation.

Space-enabled capabilities are cost-intensive and also critical to ensure the effectiveness of the ADF. Therefore, it is vital to coordinate the employment of available space services to optimise their utilisation. The Air Force has a primary role to play in ensuring this.

- *ADF is dependent on space capabilities for developing combat power.*
- *Defence space capabilities are enabled by access to space technologies and services through strategic partnerships with its allies.*
- *CAF is the ADF coordinating Capability Manager for space related activities.*

'While many of the characteristics of space power are shared with air power, the scale is entirely different and space capabilities are best regarded as being separate, but complementary, to the strengths and weaknesses of air power.'

AAP 3000, British Air and Space Power Doctrine, Fourth Edition



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